KOMPAS-3D V12

Administrator Guide

Contents

Introduction

The present Guide contains information on installation and setup of the KOMPAS-3D system, reprogramming of HASP, theoretical data on the use and creation of styles for objects and documents, as well as exercises that permit one to get acquainted in practice with methods to create user styles. In addition, the book describes the structure and syntax of service files *Graphic.pmn*, *Graphic.dns*, *Graphic.lms*, and *Graphic.kds*.

The Guide is designed for employees who operate on workplaces where the 3D solid modeling system KOMPAS-3D is installed: administrators and system setup specialists in accordance with the special features of a specific enterprise.

The book can also be useful for users who independently work with KOMPAS-3D.

Graphic design editor KOMPAS-Graphic can be purchased both as part of the system KOMPAS-3D and separately. Management of KOMPAS-Graphic is similar to that of KOMPAS-3D, which allows for the use of the present guide to work with KOMPAS-Graphic.

How to use the Guide

The sections of the Guide can be studied in random order.

It is recommended that the exercises contained in Parts III and II be performed in sequence.

The alphabetic index and a system of links allow for the use of this Guide as a reference book.

Conventions and Abbreviations

To make the text shorter, the following scheme is used to describe the selection of commands from the menu: **Name of a Main Menu Item — Name of the Command Group** (if available) **— Command Name**.

For instance, if the operational description says "...invoke command **Tools — Geometry — Lines — Line**...", this means that it is necessary to perform such operational sequence.

1. Select the item **Tools** in the Main menu.
2. Select the group **Geometry** in the list of commands of the menu **Tools** that appears.
3. Select the group **Lines** in the list of geometrical objects that appears.
4. Select the command **Line** in the list of methods to build lines that appears.

A similar scheme is used to describe the setup process: **Service — Options... — Name of the Setup Dialogue Tab — Section Name** (group of setup objects) **— Subsection Name** (subgroup of setup objects).

For instance, if the text says: "...invoke command **Service — Options... — Current Text Document — Sheet Parameters — Formatting**...", this means that it is necessary to perform such operational sequence.

1. Select the item **Service** in the Main menu.
2. Select the command **Options...** in the list of commands of the menu **Service** that appears.
3. Activate the tab **Current Text Document** in the dialogue that appears.
4. Expand the section **Sheet Parameters** in the list of setup objects (located in the left part of the tab).

5. Highlight the item **Formatting**.

   If the described command can be called with a button, the icon of this button is to be located in the left field of the paragraph. If the text mentions any buttons, icons, cursors, etc., the corresponding images are also to be located in the left field.

   The names of keyboard keys are in angle brackets and italicized. Key combinations are recorded using the “plus” sign, for instance *<Ctrl> + <Enter>*. Such a record means that one should press the key *<Ctrl>*, and then, without releasing it, press the *<F6>* key.

   Notes, tips and especially important details are highlighted with horizontal lines and marked with the following signs:

 — Note,  — Tip,  — Attention!

Technical support and maintenance

In the case of any installation and operation problems of the KOMPAS system, as well as HASP operation problems, it is recommended to perform the following actions.

1. Refer to the system documentation and try to find information about correcting the encountered errors.
2. Refer to the interactive Help system.
3. If possible, please visit the Internet page of the Technical support service of ASCON company with answers to frequently asked user questions.

   Customer technical support site:

   http://ascon.net/support/

4. If the mentioned sources do not have recommendations regarding the problem you have, get help from the technical support service of your vendor of KOMPAS products (the regional dealer).

   Address and phone number of the regional dealer: _____

   _____

   _____

   _____

   _____

5. If your vendor could not help you with the problem, please contact ASCON directly.

Saint Petersburg

Phone	(812) 703-39-33, 703-39-34
E-mail:	support@ascon.net
Send your correspondence to:	198095, ASCON, P.O. Box 107, Saint Petersburg,
ASCON Internet page:	http://www.ascon.net

Moscow

Multi-channel phone/fax	(495) 784-74-92

Send your correspondence to: 127106, Moscow, Altufyevskoye highway, as well as to construction line intersections.1/7,
Beta-Center, office 112

Direct Technical Support

E-mail: support@ascon.net

Before contacting, please prepare detailed information about the encountered situation and your actions preceding it, also about your hardware configuration and peripheral devices.

Part I

System Installation and Setup

Chapter 1.
Hardware Requirements

KOMPAS-3D V12 is intended for use on IBM-compatible personal computers running Russian-language (localized) or properly Russified operating systems:

- MS Windows XP SP3 and higher; editions:
  - Professional,
- MS Windows Vista SP2 and higher; editions:
  - Business,
  - Business x64,
  - Ultimate,
  - Ultimate x64,
- MS Windows 7; editions:
  - Professional,
  - Professional x64,
  - Enterprise,
  - Enterprise x64,
  - Ultimate,
  - Ultimate x64.

KOMPAS-3D V12 operational specification on a Microsoft Windows Vista and Windows 7 PC is described below in Section 4.4 on p. 43.

The minimum required computer hardware configuration to **install** and **startup** the system complies with the minimum system requirements for the respective operating systems.

At least 400 MB of free hard disk space is required.

DVD-ROM drive is required for installation from the distributive disk.

To print paper copies of documents, you can use any models of printers or plotters fhaving the developed Windows version installed on your computer.

When selecting hardware configuration, keep in mind that hardware requirements increase with the complexity of tasks to be solved (level of drawing details, complexity of assemblies).

KOMPAS-3D performance on a particular computer also depends on the characteristics of its individual parts (processor, RAM etc.). Contact your dealer regarding most preferable hardware configurations.

Chapter 2.
KOMPAS–3D V12 Distribution Package

The installation package consists of set of KOMPAS system programs and some libraries.

- Main programs:
  - KOMPAS-3D;
  - KOMPAS-Graphic;
  - BOM Design System;
  - Text Editor;
- KOMPAS Alphabet Tutorial;
- KOMPAS-3D Operating Manuals.
- Drawing Fonts;
- HASP SRM Protection System Software.
- Libraries:
  - eCAD-to-KOMPAS Text Converter;
  - Library of eCAD-to-KOMPAS Data Converters;
  - KOMPAS Application Library;
  - Templates Manager;
  - 3D Model Recognition System;
  - KOMPAS-Macro;
  - Document Check;
  - Steel Structures 3D Library;
  - Standardized Parts Library: ISO, DIN Fasteners for KOMPAS-3D;
  - 3D Piping;
  - Library of Flat Patterning of Air Duct and Tubing Elements;
  - TraceParts Integration Library;
  - 3D Animation Library;
  - Measurement Unit Converter.
- Format Import Libraries:
  - PDF (P-CAD);
  - Model (CATIA 4.x);
  - IGES;
  - DWG;
  - DXF;
- Libraries of Export to Formats:
  - IGES;
  - DWG;
  - DXF.

Chapter 3.
Protection of KOMPAS–3D system from unauthorized use

Starting from version V11, the KOMPAS-3D system and it's applications are protected against unauthorized use via HASP SRM technology by Aladdin Knowledge Systems Ltd. The protection system is a software-hardware solution that implements a 128-bit cryptographic algorithm in accordance with the Advanced Encryption Standard (AES).

3.1. Hardware Protection Device

Standard package of KOMPAS-3D system includes an unauthorized use protection device : a hardware protection key (Fig. 3.1) that is plugged into a computer USB port. The key has it's own memory that stores information about purchased components of KOMPAS-3D system and theirs terms of use.

Fig. 3.1. Hardware Protection Keys

Hardware protection of KOMPAS-3D system and some of it's components against unauthorized use is ensured by the HASP HL keys, firmware 3.21.

For allowing the licensing flexibility, keys of different types may be used (Table 3.1). All key models ensure software protection against unauthorized use. Key types differ in features of key license management being written on key, and the memory capacity availale for using.

Table 3.1. Types of hardware protection keys used with KOMPAS-3D system

Key type	Description	Type of license supported
HASP HL Pro HASP HL Max	Protection of several applications and their components on a local PC.	▼ Unlimited, ▼ Component-wise, ▼ Based on product run times, ▼ Demo, ▼ Licensing procedure customized as per the run times counter.

Table 3.1. Types of hardware protection keys used with KOMPAS-3D system

Key type	Description	Type of license supported
HASP HL Time	Protection of several applications and their components on a local PC. Contains a built-in real time clock.	▼ Unlimited, ▼ Component-wise, ▼ Subscription-based (purchase of updates and new versions), ▼ Lease (payment of specified operation period), ▼ Licensing procedure customized in accordance with the real time clock.
HASP HL Net	Network protection of several applications and their components.	▼ Unlimited, ▼ Component-wise, ▼ Subscription or Lease, ▼ Floating (shared between users), ▼ Based on product run times, ▼ Demo, ▼ Licensing procedure customized based on number of users and run times counter.
HASP HL NetTime	Network protection of several applications and their components. Contains a built-in real time clock.	▼ Unlimited, ▼ Component-wise, ▼ Shared between users, ▼ Based on product run times, ▼ Demo, ▼ Licensing procedure customized based on number of users, run times counter, and real time clock data.

The HASP SRM-based hardware protection keys (except for HASP HL Max type keys) are backward compatible with the HASP4 and HASP HL keys, which were used for protection of KOMPAS-3D previous versions.

The HASP HL keys can be reprogrammed to allow the complete functionality of the new technology (see Section 3.7 on p. 40).

3.2. Protection system software support

During installation of KOMPAS-3D, the **HASP SRM Run-time Environment** protection system shall be installed automatically at each workstation. This system provides launching of software protected with the HASP SRM system and it's interaction with protection key during operation. During installation of this program, the following components of the HASP SRM software are installed automatically.

- Hardware protection key driver.
- **HASP SRM Admin Control Center** that provides managing of network licenses (see Section 3.4 on p. 19).
- **HASP SRM Remote Update System** that provides updating of licenses in the installed keys when changings in the license agreement (see Section 3.6 on p. 36).

3.3. Protection Scheme

The HASP SRM system enables the use of protected software installed on local or networked PCs.

The proper functioning of HASP SRM protection can be affected by a firewall (for example, Windows Firewall). If your KOMPAS-3D system supplied with protection key and valid license runs in familiarization or demo mode, you should change your firewall settings.

3.3.1. Local hardware protection keys

The local key of the following types may be used for operation of a protected application on local PC:

- HASP HL Pro,
- HASP HL Max,
- HASP HL Time.

Subject to the selected licensing conditions, one or several local protection keys are included into a single-workstation delivery package.

The local key memory stores data on purchased components and licensing conditions.

3.3.2. Network hardware protection keys

For using of KOMPAS-3D system on networked PCs the network hardware protection key of HASP HL Net or HASP HL NetTime type is sufficient. The key memory stores data on purchased components, number of licenses and licensing conditions. The key is connected to any locally-networked computer with installed **HASP SRM Run-time Environment** protection software.

Network key is included into the distribution package of several workstations intended for network use. It allows several users to work with each of system components simultaneously. The maximum number of users working with each component at a time is determined by the number of licenses for it. The computer with the network key installed is called the**network key server**.

To run KOMPAS-3D system on networked computers, both local and network keys can be used.

3.3.3. Protected software running procedure

When loading KOMPAS-3D and/or it's components, search for valid and available runtime licenses is performed. Initially, the local key shall be checked. If no required licenses are available in the local key, tsuch licenses shall be automatically searched across the available network keys.

If no license is found, the KOMPAS-3D system shall be run in familiarization mode. This mode ensures the complete functionality of both system and it's components for about 30 days after initial startup.

To run KOMPAS-3D and it's components in familiarization mode complete the following steps:

- turn off the local key,
- deactivate using availability of network keys through the **HASP SRM Admin Control Center** settings (see Section 3.5.3 on p. 34).

During each startup of KOMPAS-3D in familiarization mode, an information message shall display the number of days left of this period.

The familiarization mode can be run only once at each computer.

If no key is detected, or the key contains no license for KOMPAS-3D and/or components being run, or if all licenses on the network key are used, or the time limit at the clock-based key is over (HASP HL NetTime or HASP HL Time), the KOMPAS-3D system shall operate in demo mode. Depending on the software implementation, each component (of 3D solid modeling system, or any library, etc.) shall not run or shall operate in demo mode.

During operation, KOMPAS-3D system periodically checks for the presence of local or network hardware protection key and determines whether the using of the system components loaded at the moment is authorized. Key presence is checked in background mode, with the user's work practically not hindered. If the key is not found during such a check, or an error occurs when it is accessed, or the time limit at the clock-based key is over, a warning message about system's switchening into demo mode shall be appeared. This time interval begins at the moment when the **OK** button in the message is pressed. After five minutes have elapsed, a message about system's workening in demo mode shall be displayed.

Once you have received the first message, it is essential to save all opened documents and restart the KOMPAS-3D system.

When KOMPAS-3D is in demo mode, various restrictions apply, including a prohibition on saving documents.

3.4. License Management for KOMPAS–3D Network Application

When installing the HASP SRM Run-time Environment on a workstation, the HASP License Manager is installed automatically. It allows to manage licenses for network application of KOMPAS-3D and it's components. To access the License Manager and manage licenses, the Admin Control Center (ACC) tool is included into the HASP SRM Run-time Environment package.

The ACC default configuration ensures access to setup and all commands of the program. ACC running on any networked computer allows to control License Managers of all networked computers. It is recommended to limit user access to ACC resources installed on their workstations.

3.4.1. Admin Control Center Startup

Startup Options

The following options for Admin Control Center startup are available.

- From Windows main menu: **Start — Programs — ACSON — KOMPAS-3D V12 — Protection Key Programs — Protection Key Info**. When launching the program in this way your browser shall open a tab containing information about hardware protection keys available for your computer (see Section 3.4.3 on p. 22).
- From Windows main menu: **Start — Programs — ACSON — KOMPAS-3D V12 — Protection Key Programs — Protection System Info**. If this procedure is followed, your browser shall open a tab containing information about the current License Manager (see Section 3.4.8 on p. 27).
- Generally, to launch ACC enter a domain name or IP-address of the computer with installed License Manager and port number 1947 in your browser window (Internet Explorer, Opera, etc.), for example *http://10.3.1.37:1947* or *http://LM_server:1947*, and follow the link.

Port 1947 should be open, otherwise the using of ACC shoall be impossible.

To access the License Manager at a remote computer, the following is required:

- make sure the access for remote users is enabled in the ACC settings of a remote computer (see Section 3.5.4 on p. 35),
- changing of ACC settings on a remote computer is only possible if you have the access password for ACC on that computer (see Section *ACC Password Protection* on p. 32).

To access the License Manager on a local computer, the address line should contain the following: *http://localhost:1947*.

Use of Language Templates

English is the ACC original interface language.

3.4.2. ACC Interface

Once the ACC startup is completed, the ACC page shall be opened in your default browser. Figure 3.3 contains the example of the Internet Explorer window after the command has been activated through **Start — Programs — ACSON — KOMPAS-3D V12 — Protection Key Programs — Protection Key Info**.

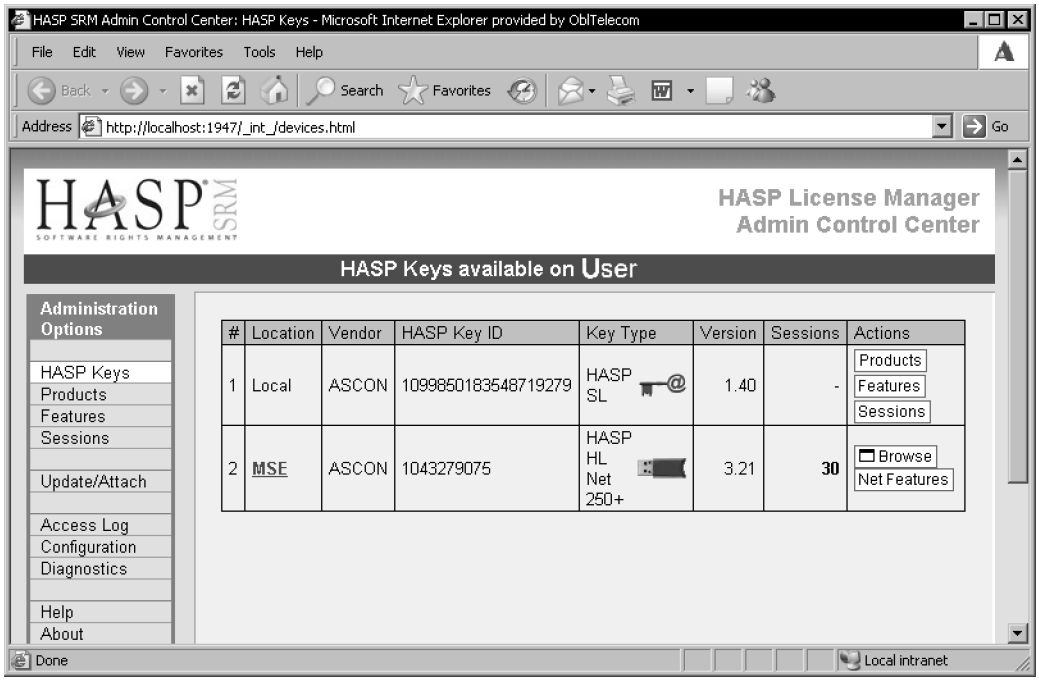


Fig. 3.2. Template Creation Example

The left part of page contains the ACC commands menu. The description of commands is presented in Table 3.2. These commands belong to the License Manager of a computer whose network name or IP-address is shown in the ACC header line (hereinafter referred to as "*current computer*"). Once the command is invoked, the browser window shall display a new tab containing control elements enabling additional operations related to this command.

Table 3.2. Description of Admin Control Center commands

Command Name	Command Designation
HASP keys (HASP Keys)	Displays the list of hardware protection keys available in the network, including network and local keys.
Products (Products)	Displays the list of all applications available through all License Managers in the network.
Licenses (Features)	Displays the following data: ▼ list of KOMPAS-3D components licensed for each key, including network and local keys, ▼ component licensing conditions, ▼ number of users using each component.

Table 3.2. Description of Admin Control Center commands

Command Name	Command Designation
Sessions (Sessions)	Displays client sessions on the current computer (local clients and network clients connected to the License Manager on the current computer). If required, the sessions can be forcedly terminated.
Update/Attach (Update/Attach)	Allows to update the license in the key (see also Section 3.6 on p. 36).
Access Log (Access Log)	Displays the License Manager access log of the current computer. The log information can be saved to *access.log* text file that is created automatically in the folder with ACC settings file *hasplm.ini*. Complete path to this file is displayed in the lower part of browser tab on the ACC setup page (see Section 3.5 on p. 28).
Configuration (Configuration)	Allows to configure ACC parameters on the current computer, for example, access rights for the ACC control, access to a remote License Manager from the current computer, access of remote users to the current computer's License Manager, report log file formats (see Section 3.5 on p. 28).
Diagnostics (Diagnostics)	Allows to display information on the current License Manager and prepare a report for technical support service.
Help (Help)	Enables access to the ACC Help system.
About (About)	Displays information on the License Manager version, also contains a link to the knowledge base web-site of the HASP SRM system developer.

The lower right corner of each command tab contains the link to a section of ACC Help system related to this tab.

3.4.3. Viewing the list of keys available in the network

To view network and local hardware protection keys on the networked computers, invoke the **HASP (HASP Keys)** command.

Your browser shall display the tab **HASP Keys available on <name of current computer>**. The tab contains the table with key data. The table description is presented in Table 3.3.

Table 3.3. List of keys available in the network

Column name	Column Contents
Location	Name of the computer with connected key. If the key is connected to the current computer, it's name shall be displayed as *Local*. Name of a remote computer is a link. Once you click this link, that computer becomes current. ACC of that computer shall be opened in a new tab. Make sure the access for remote users is enabled in the ACC settings of a remote computer (see Section 3.5.4 on p. 35),
Vendor	Software Vendor Code.
HASP Key ID	Unique Key Identifier.
Key Type	Type designation and zoomed out image of the hardware protection key.
Version	Number of key firmware version (see Section 3.7 on p. 40).
Sessions	Number of active access sessions for the key.
Actions	Commands allowing to access the additional key data. Set of command depends on whether this key is local or networked. ▼ **Sessions** allows to open the tab containing additional session information for this key. ▼ **Features** allows to open the tab containing information on application components that use licenses stored in the current key. Available for local key of current computer. ▼ **Blink on/off** allows to control blinking of the key LED for key identification. ▼ **Browse** allows browsing through all application components for the specified network key. License Manager installed on the computer with this key shall be opened in a new tab of your browser. Access to the remote License Manager is possible if the remote user access is enabled in it's settings (see Section 3.5.1 on p. 29). ▼ **Net Features** allows to view application components available for a specified network key of the current computer.

Local software protection key is the first key shown in the list of available local and network hardware protection keys. This key ensures protection of KOMPAS-3D system and some of it's components throughout familiarization period. The **Licenses** command makes available the following information about this period:

- status (whether the system is running in familiarization mode or not, whether the work in familiarization mode is possible or familiarization period has expired),
- start and end dates/times.

3.4.4. Viewing the full list of applications available in network for the current computer

To view the list of applications, call the **Products** command.

Your browser shall display the tab **Products available on <current computer's name>**.

This tab contains a table with applications related to all License Managers in the network. The table description is presented in Table 3.4.

Table 3.4. List of applications available in the network for the current computer

Column Name	Column Contents
Product Name	Application Name (specified by Vendor).
Vendor	Software Vendor Code.
Location	Name of computer with connected key for this component. If the key is connected to the current computer, it's name shall be displayed as *Local*.
Actions	Commands that enable access to additional application data. ▼ **Features** allows to open the tab **Licenses for** containing the list of application components.

3.4.5. Viewing Application Component List

To view the list of application components licensed in the keys available in the network, invoke the **Features** command.

Your browser shall display the tab **Features available on <current computer's name>**. The tab contains a table with information about all application components licensed in each of the (both network and local) keys available in the network. This table also contains information about licensing conditions and current usage of components. The table description is presented in Table 3.5.

Table 3.5. List of application components licensed in the keys available in the network

Column Name	Column Contents
Vendor ID	Software Vendor Code.
HASP Key ID	Unique Key Identifier.
Feature ID	Unique ID and application component name specified by vendor.
Location	Name of computer with connected key. If the key is connected to the current computer, it's name shall be displayed as *Local*.

Table 3.5. List of application components licensed in the keys available in the network

Column Name	Column Contents
Access	Type of computers with permission to use the component. Available options are the following: ▼ *Loc* access is allowed for local computer only, ▼ *Net* access is allowed for remote computers in the network, ▼ *Disp* access for remote computers is allowed through a terminal server (not used in KOMPAS-3D system).
Count	Counting method for the number of component run times. The following counting methods are available: ▼ *Process* all requests for access to a single process are treated as a single access, ▼ *Station* all requests for access to a single computer are treated as a single access, ▼ *Login* component usage count shall be included into all requests for use.
Logins	Number of users currently using the same application component.
Limit	Maximum possible number of users allowed to use a component at the same time.
Detached	Currently not used.
Restrictions	Restrictions on running an application component on a given key. For example, *Expired* license period is expired on a real time clock key.
Sessions	Number of active access sessions to the key.
Actions	Commands that enable to access the additional application data. ▼ **Sessions** allows to open the tab **Sessions on** containing information about access sessions to the specified application component.

3.4.6. Viewing list of access sessions to the protected products and session management

To view the list of access sessions, call the **Sessions** command.

Your browser shall display the page **Sessions on <current computer's name>**. The page contains a table with information about all access sessions of local and remote users to the current computer. Control elements on this page allow to view information about access sessions, as well as terminate them.

The table description is presented in Table 3.6.

Table 3.6. List of access sessions to the current computer

Column Name	Column Contents
ID	Unique Session Identifier.
HASP Key ID	Unique Key Identifier.
Location	Name or IP address of the computer with connected key. If the key is connected to the current computer, it's name shall be displayed as *Local*.
Feature ID	Unique ID and application component name specified by vendor.
Address	IP-address of the computer that makes the access or *Local* if accessed from the local computer.
User	User name uing the application component.
Machine	Network name of the computer from which the application component is used and ID of the process that opened the access session.
Login Time	Start time of access session to application component.
Timeout	Current time before expiration of license on server. Initial time interval is 12 hours. When checking for license availability, i.e. every 15 minutes, value in this column shall become equal to the initial one. If KOMPAS-3D system operation is terminated abnormally, checking for license availability shall be cancelled. If operation of the KOMPAS-3D system is not prolonged at the current workstation, the license shall be deactivated after the column value becomes zero.
Actions	Commands that enable to access the additional application data. ▼ **Disconnect** — allows to terminate the access of the current user to the current application component (i.e. to disconnect the user from license). Execution of this command is only possible if you have the access password for ACC on the computer with connected hardware protection key (see Section *ACC Password Protection* on p. 32).

3.4.7. Viewing log of access history to Lic ense Manager on current co mputer

To view the access log, invoke the **Access Log** command. Your browser shall display the page **Access Log on <current computer's name>**. The page contains a table with information about access sessions of local and remote users to the current computer's License Manager. By default, the table displays the last 20 records. Buttons **20**, **100** and **1000** allow to select the number of records displayed on the page.

By default, each log record contains the following information:

▼ Date and time of recording,

- User's IP address and port,
- User ID,
- Access method,
- URL of the requested resource,
- Function used,
- Function parameters,
- Value returned by the function.

The default log template can be changed in the tab **Basic Settings** of the ACC setup page (see Section *Log Template* on p. 30).

If the **Write an Access Log File** option is enabled in the **Basic Settings** tab of ACC configuration page, then the access log shall be saved to the text file *access.log*. The file is created automatically in the folder with ACC settings file *hasplm.ini*. Complete path to this file is displayed in the lower part of browser tab on the ACC setup page (see Section 3.5 on p. 28). By default, these files are saved to folder *C:\Program Files\Common Files\Aladdin Shared\HASP*.

3.4.8. Viewing information about the current License Manager

To view information about the current License Manager, activate the **Diagnostics** command.

Your browser shall display the tab **Diagnostics for HASP License Manager on <current computer's name>**. The tab contains a table with information about the License Manager.

The table description is presented in Table 3.7.

Table 3.7. License Manager Information

Column Name	Column Contents
HASP License Manager Version	Current License Manager Version.
Computer Name (Computer Name)	Name of computer with installed License Manager, and process ID (PID).
Operating System (Host Operating System)	Name and version of operating system installed on the computer that runs the License Manager.
Protocols (LM Protocols)	▼ License Manager Current Protocol. Possible options are **IPv4** (only IPv4) or **IPv4, IPv6** (IPv4 and IPv6). ▼ Current License Manager IP address.
Uptime (Uptime)	Uptime of the active access session to the License Manager.
Template Sets (Template Sets)	List of available templates of ACC interface.

Table 3.7. License Manager Information

Column Name	Column Contents
Current Usage (Current Usage)	Information on current usage of License Manager: ▼ **logins** number of acquired licenses, ▼ **sessions** number of current access sessions to the License Manager, ▼ **connections** number of current network connections from the total available number.
Login Requests (Login Requests)	Number of licenses obtained from the current License Manager since it's startup.
Requests (Requests)	Number of requests to the License Manager since it's startup.
Requests (Data Volume)	Number of information bytes received and transmitted by this server since the License Manager startup.
Errors (Errors)	Total number of errors related to the key or transmissions from this server since the License Manager startup.
Threads (Client Threads)	Number of concurrent subprocesses opened by the License Manager.
Drivers (Run-time)	List of running components of the HASP SRM system and their versions.
Generate Report (Generate Report)	This command allows to create a diagnostic report in HTML format. The report contains detailed information about system that runs a particular License Manager instance, license usage and other data that can be used for diagnostic purposes. Use this report when contacting the client support service.

3.5. ACC Setup

The ACC setup allows to set the following parameters:

- user rights for accessing the protection system network resources,
- access settings for remote License Managers,
- rights of networked workstations' users to access and control the License Manager on the current computer.

To make any settings, call the **Configuration** command. Your browser shall display the new tab **Configuration for HASP License Manager on <current computer's name>**. The configuration control elements are grouped in the tabs. Tab names correspond to configuration setting types.

To effect any ACC settings, enter the administrator password (if previously entered) (see Section *ACC Password Protection* on p. 32).

The ACC settings are stored in the *hasplm.ini* file that is created automatically when changing the default settings for the first time. Complete path to this file is displayed in the lower part of browser tab.

3.5.1. ACC Basic settings; Basic Settings Tab

AAC Basic Settings

ACC basic settings include setting a computer name whose ACC is being set up, report log generation parameters, and password protection settings. The control elements of this tab are described in Table 3.8.

Table 3.8. Control elements of **Basic Settings** tab

Name of Control Element	Description
Machine Name (Machine Name)	Network name of a computer whose ACC is being set up.
Allow Remote Access to ACC (Allow Remote Access to ACC)	This option allows to control access of remote users to ACC of the computer, whose name is specified in the **Computer Name** field. The option is disabled by default.
Display Refresh Time (Display Refresh Time)	Refresh time of information is displayed on the ACC tabs in seconds.
Table Rows per Page (Table Rows per Page)	Number of table rows per page displayed on each page of the tab. This value may vary from 5 to 100.
Write an Access Log File (Write an Access Log File)	This options allows to control generation of the access log files for License Manager. If enabled, the following options for managing the log content become available: **Include Local Requests**, **Include Remote Requests**, **Include Administration Requests**.
Include Local Requests	Allows to log information about access sessions of local users to the application components licensed in the key connected to this computer.

Table 3.8. Control elements of **Basic Settings** tab

Name of Control Element	Description
Include Remote Requests	Allows to log information about access sessions of networked computers users to the application components licensed in the key connected to the current computer.
Include Administration Requests	Allows to log information about access sessions to the License Manager through ACC.
Write an Error Log File **(Write an Error Log File)**	This option allows to manage the generation of error log.
Write a Process ID (.pid) File **(Write a Process ID (.pid) File)**	Allows to generate the Process ID file.

Log Template

Command **Edit Log Parameters** makes it possible to change the template of License Manager Access Log.

On **Edit Log Parameters** command, the **Edit Log Parameters**page shall be displayed in your browser. The current set of template element designations is available in the upper field of the page. The field content is presented in text format. Element designations are key words. They are located between braces. You can add comments to the log elements for clarification. Element designations can be edited as a regular text, or using the content of the field **Available tags for log: (Available tags for log:**).

The field **Available tags for log:** contains designations and short descriptions of available template elements. To add any element to the template, select it with the mouse and call the **Add** command. The element designation shall be added to the end of the list.

The **Back to Configuration** command allows to finish template editing and get back to configuration page.

Example of created log template is presented in Figure 3.3.

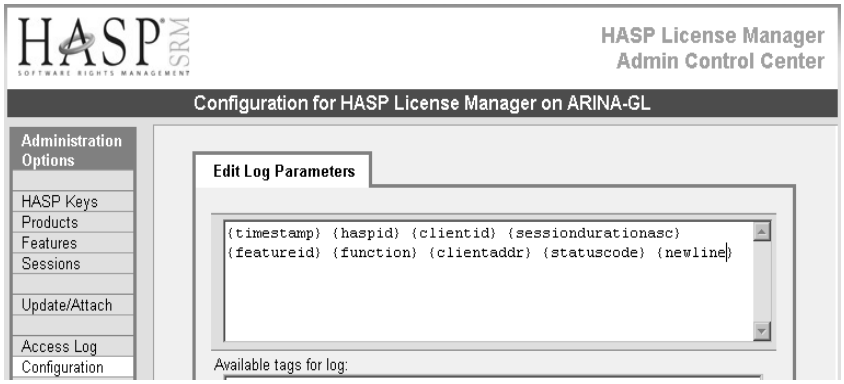


Fig. 3.3. Template Creation Example

Based on this template, each record in the log shall contain the following information:

- Date and time of recording,
- ID of the key whose license is currently used,
- User ID,
- Duration of license usage session,
- Component ID,
- Request type e.g. to obtain a license (LOGIN), to release a license (LOGOUT).
- License server IP address,
- Request completion result code.

The **newline** element enables line advancing in the log.

The request completion result code may be used for analyzing potential errors during execution of requests. For example, if the code is 0, then the request has been successfully completed. Code value "7" means that no hardware protection key is found. Complete description of code meanings is presented in the *API Status Codes* Section of Software Protection and Licensing Guide document. This document is contained in the *HASP_SRM_Guide.pdf* file and supplied with the protection system document package.

Fragment of a log file generated by the template is presented in Figure 3.3 below.

2009-01-23 11:30:00 HASP ID:1086818230 user ID:Test@Tester Session duration: 0 days 0 hours 0 minutes 0 seconds component ID:120 request type:LOGIN IP of the license server: 127.0.0.1 Result code:0

2009-01-23 11:31:54 HASP ID:1086818230 user ID:Test@Tester Session duration: 0 days 0 hours 1 minutes 54 seconds component ID:120 request type:LOGOUT IP of the license server: 10.3.1.2 Result code:0

In addition to records that contain information about license usage, the report log contains much of other information. To facilitate analysis of the log, it is recommended to filter it's content, for example, by a text editor.

ACC Password Protection

The **Change Password** command allows to set the ACC password.

When running HASP SRM software package, the following operations are password-protected:

- disconnecting a user from the license (see Section 3.4.6 on p. 25),
- changing ACC Configuration.

To set a password, use the **Change Password** command. Your browser shall display the **Change Password** page. Enter the current password to the **Current Admin Password** field.

The password is not set by default. During initial setting of the password, make sure that the field **Current Admin Password** is empty.

Enter a new password to the **New Admin Password** field, and then re-enter the same to the **Re-enter new Admin Password** field. Once a new password is set, invoke the **Submit** command. You may reject new settings through the **Cancel** command.

The password setting tab shall be closed. The **Basic Settings** tab shall become active.

The previous password is valid throughout your browser running period. To effect changes, restart the browser.

New changes made on the **Basic Settings** tab should be applied through the **Submit** command. The **Set Defaults** command restores initial default settings.

Action of the **set Defaults** command is not applied to the set password.

3.5.2. Setting up User Access to the License Manager; Users Tab

Settings made on the **Users** tab allow to explicitly set the names of those users permitted or denied to access License Managers, as well as names of computers with installed License Managers that are attempted to access.

The control elements of this tab are described in Table 3.9.

Table 3.9. Control elements of **Users** tab

Name of Control Element	Description
User Restrictions (User Restrictions)	This field is used to set authorization/restriction rules to be applied on users during their attempts to access the License Manager.

These rules have the following format:

<restricrion>=[username]@[hostname]

Description of parameters is presented in Table3.10.

Table 3.10. Elements of the Access Control Rules

Parameter Designation	Name	Possible Values	Description
restriction	Restriction type.	allow	allow
		deny	deny
hostname	Computer name ot IP-address	10.3.1.27, test-2	
		all	all networked computers
		none	no networked computers
username	Username.	User1, testuser	
		all	all users in the network
		none	none of the users

Parameters *hostname* and *username* are optional. Absence of a parameter while entering a line corresponds to the value *all*.

For example, if the rule *allow=[username]* is set, access to the License Manager for user *[username]* shall be enabled regardless of the networked computer the License Manager is installed on.

If the line is entered as *allow=[username]* then after the changes of configuration are confirmed through the **Submit** command the line shall be modified to *allow=[username]@all*.

Similarly, if you set the line as *allow=@[hostname]* then access to the License Manager installed on the computer *[hostname]* shall be enabled for all users.

If the line is entered as *allow=@[hostname]* then after the confirmation of changes in configuration through the **Submit** command this line shall be modified to *allow=all@[hostname]*.

Each rule should be recorded to a separate line. Rules are processed one by one top-down. Once the first match to conditions is found, processing of rules stops.

The rules processing examples are presented in Table 3.11. It is assumed that all rules are stored in the **User Restriction** field in the order shown in the table.

Table 3.11. Examples of Access Control Rules Processing

Rule	Description of rule processing by ACC
deny=User1@seat1	User *User1* is denied to access the License Manager installed on computer *seat1*.
allow=User1@all	User *User1* is allowed to access all computers except for *seat1*. Restriction is determined by the previous rule.

Table 3.11. Examples of Access Control Rules Processing

Rule	Description of rule processing by ACC
allow=User2@all	User *User2* is allowed to access all computers.
deny=all@seat2 **deny=all@seat3** **deny=all@seat4**	All users are denied to access License Managers installed on computers *seat2*, *seat3*, *seat4* except for users *User1* and *User2*. Access rights of these users have been already processed.

Command **Show Recent Users** allows to display the list of users last accessed the License Manager.

To apply setting changes made on this tab, invoke the **Submit** command. The **Cancel** command allows to cancel any changes in settings. The **Set Defaults** command restores default values of all settings.

3.5.3. Setting Up User Access to remote License Managers; Access to Remote License Managers Tab (Access to Remote License Managers)

Control elements on tab **Access to Remote License Managers** help to specify the names of accessible computers with installed License Managers.

The control elements of this tab are described in Table 3.12.

Table 3.12. Control Elements on the **Access to Remote License Managers** tab

Name of Control Element	Description
Allow Access to Remote Licenses **(Allow Access to Remote Licenses)**	This option allows to control access to License Managers on other networked computers from the current computer. By default, it is enabled.
Broadcast Search for Remote Licenses **(Broadcast Search for Remote Licenses)**	This option enables to control the search for computers with installed License Managers in the network. If this option is disabled then the names of computers to be searched for installed License Managers should be explicitly set in the **Specify Search Parameters** field. If enabled, the search shall be carried out across all computers (broadcast search).
Aggressive Search for Remote Licenses **(Aggressive Search for Remote Licenses)**	This enables to control the method for searching computers with installed License Managers. If this option is enabled, the remote License Managers shall be accessible regardless of whether they can be found by means of UDP protocol-based standard search. The "aggressive" search reduces frequency of updates of the HASP system status, however, it can pass around firewalls.

Table 3.12. Control Elements on the **Access to Remote License Managers** tab

Name of Control Element	Description
Specify Search Parameters **(Specify Search Parameters)**	This field is used to explicitly specify the names of computers for the License Manager search. Computer addresses can be specified as follows: ▼ IP address, for example 10.3.1.37; ▼ Computer network name, for example, test-2; ▼ Broadcast address, for example, 10.3.1.255. When using the Ipv6 protocol, make sure that all specified addresses comply with this protocol. Each address shall be set in a separate line.

To apply setting changes made on this tab, invoke the **Submit** command. The **ancel** command allows to cancel any changes to settings. The **Set Defaults** command restores default values of all settings.

3.5.4. Setting Up Access of remote users to the current computer License Manager ; Access from Remote Clients Tab

Control elements on tab **Access from Remote Clients** allow to make the following settings:

- ▼ names of computers allowed or denied to access the current computer License Manager,
- ▼ License Manager access rules.

The control elements of this tab are described in Table 3.13.

Table 3.13. Control elements on tab **Access from Remote Clients**

Name of Control Element	Description
Allow access from Remote Clients **(Allow access from Remote Clients)**	This option allows to manage access of remote users to the current computer License Manager.
Access Restrictions **Access Restrictions)**	This field is used to set authorization/restriction rules to be applied on users during their attempts to access the License Manager.

These rules have the following format:

<restricrion>=[item]

Description of parameters is presented in Table3.14.

Table 3.14.

Parameter Designation	Name	Possible Values	Description
restriction	Restriction type.	allow	allowed
		deny	denied
item	Networked computer name or IP address	10.3.1.27 or TEST2	
		all	all networked computers
		none	none of networked computers

Each rule should be recorded to a separate line. Rules are processed one by one top-down. Once the first match to conditions is found, processing of rules stops.

Command **Show Recent Client Access** allows to view the list of computers recently accessed the current computer License Manager.

To apply setting changes made on this tab, invoke the **Submit** command. The **Cancel** command allows to cancel any changes to settings. The **Set Defaults** command restores default values of all settings.

3.6. Remote Reprogramming of the Hard ware Protect ion Key

Remote reprogramming of the key is performed with HASP SRM Remote Update System.

3.6.1. General License Update Procedure

When purchasing KOMPAS software, you receive network or local hardware keys. Data on purchased KOMPAS modules that are therefore available for the user are stored in the keys memory.

In future you may need to change the license conditions, for example, to purchase additional KOMPAS modules and install them on the same computer, change the number of licenses etc.

To change your license conditions, complete the following steps.

1. Prepare an Agreement on Modification of License Conditions.
2. Create the key status file with information on user license current status.
3. E-mail the status file to ASCON.
4. Purchase additional modules.
5. Receive an answer file from ASCON.
6. Reprogram the key by storing information on newly purchased modules to it's memory.
7. Install purchased modules of KOMPAS-3D system.

3.6.2. Generating the key status file

Generation of the key status file and key reprogramming is carried out with the use of HASP SRM Remote Update System (HASP SRM RUS). File *hasprusa.exe* is the executable file.

To launch HASP SRM RUS, select from the Windows main menu **Start — Programs — ASCON — KOMPAS-3D V12 — Protection Key Programs — HASP SRM Remote Update System**. You may also launch the *hasprusa.exe* file located in the *\HASP* folder of KOMPAS-3D root folder.

When the program is launched, a HASP SRM RUS window shall be displayed (Fig. 3.4).

Fig. 3.4. License Updater window; data collection tab

By default, the **Collect Key Status Information** tab is opened; it is used to collect information on the status of licenses stored in the key.

To generate the key status file, complete the following steps.

1. Plug in the hardware key into a computer port.
2. Click the **Collect information** button.

   The standard dialog of Windows File Save shall appear on the screen. The default extension of a key status file is *c2v* (meaning ***c****ustomer to* ***v****endor*).
3. Enter a request file name and close the dialog.

   The program window shall display the message on successful operation completion: *Key status retrieved from HASP successfully*. The created file shall be saved to the specified folder.

   If no key is found by program during operation execution, a warning message shall be displayed (Fig. 3.5).

Fig. 3.5. HASP SRM RUS message in case no key is found

In this case insert the hardware protection key into USB port and repeat operations.

If, while running, the program detects several keys, the following dialog shall be displayed: **Select HASP** (Figure 3.6).

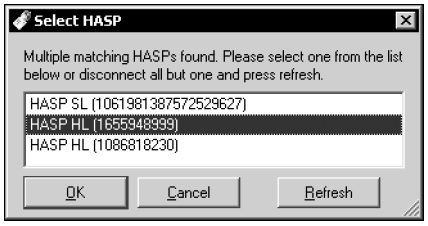


Fig. 3.6. HASP SRM RUS message when several keys are detected

Should this occur, chose one of the keys with the mouse and then press **OK** button, or disconnect all keys except the required one and press **Refresh** button.

If you need to update licenses on several keys, you should perform the following operations one by one specified for each key. A status file shall be generated for each key.

3.6.3. Sending Status File

Once you have completed preparing key status files, e-mail them to ASCON company, attaching necessary comments.

It is recommended to contact the office where ASCON software has been initially purchased. If you have purchased KOMPAS-3D system from a regional dealer, you may refer to them to update the keys.

3.6.4. Reprogramming the Key After Answer Receiving

After you purchase the additional KOMPAS-3D modules ordered, ASCON company shall send you files with license updates.

Update files may be delivered in the following formats:

- file with extension *v2c* (meaning ***v**endor to **c**ustomer*).
- executable file with extension *exe*.

To reprogram a key using a file with *v2c* extension, complete the following steps.

1. Plug in the hardware key into a computer port.
2. Launch HASP SRM RUS. In the program window, open the tab **Apply License Update** (Fig. 3.7).

Fig. 3.7. Window of the License Update Program; License Update Tab

3. Press **Browse for update file** button to browse for update file. The standard Windows File Open dialog shall appear on the screen.
4. Open the update file received from ASCON company.
5. Click the **Apply Update**button.

   Additional products data contained in the licence update file and corresponding to the current key shall be saved to this key. In case of successful saving to the key, a correspondent message shall be displayed.

If you need to update licenses on several keys, you should perform the following operations one by one specified for each key.

If you received an executable file with extension *exe*. from the vendor, launch this file to update the license. HASP SRM RUS shall be launched automatically.

3.6.5. Installing modules of KOMPAS–3D system.

Once the hardware protection key is reprogrammed, you may install licensed components of the KOMPAS-3D system. For this, do the following.

- Select the section of the KOMPAS-3D system supply package which the newly installed components belong to Basic Package.
- Run installation of the selected section (see Sections 4.1 on p. 41).
- In the **Program Maintenance** dialog of the Installation Wizard, select **Change**.
- Select the required components in the Wizard subsequent dialogs, and install them.

3.7. Key Firmware Update

Firmware of the HASP HL hardware protection keys (received in KOMPAS-3D supply package of previous versions) can be updated up to version 3.21. This version supports full functionally of the HASP SRM protection system. To update the firmware, use the update program performing by executable file such as *FirmwareUpdate.exe*. This file is stored in the folder *KOMPAS-3D_V12\KOMPAS-3D\Support* of the installation disk.

Connect the key whose firmware should be updated.

To start the program, launch it' executable file. The window **HASP SRM RUS** shall be displayed (Fig. 3.8).

Fig. 3.8. Firmware Update Program Window

The button **Apply Update** allows to update the hardware protection key firmware. Close the window after the firmware is updated.

Chapter 4.
KOMPAS–3D Installation and Removal

The KOMPAS-3D system is installed on a computer in the following manner.

1. Installation of the KOMPAS-3D system package. During installation, the protection software HASP SRM Run-Time Environment is installed in automated mode.
2. Installing the hardware protection key into a computer USB port.

During installation of KOMPAS-3D system, it is recommended to deactivate your antivirus software and firewall (e.g. Windows Firewall).

4.1. Package Installation

To install the KOMPAS-3D system package on the hard drive of your computer, complete the following steps.

1. Start Windows.
2. Use the KOMPAS-3D V12 distribution disk to launch the file *Setup.exe* from the folder *KOMPAS-3D_V12\KOMPAS-3D*.
3. Next, follow the installation program queries.

   In the **Installation Type** window, specify the required installation type: **Full** or **Custom** (Fig. 4.1).

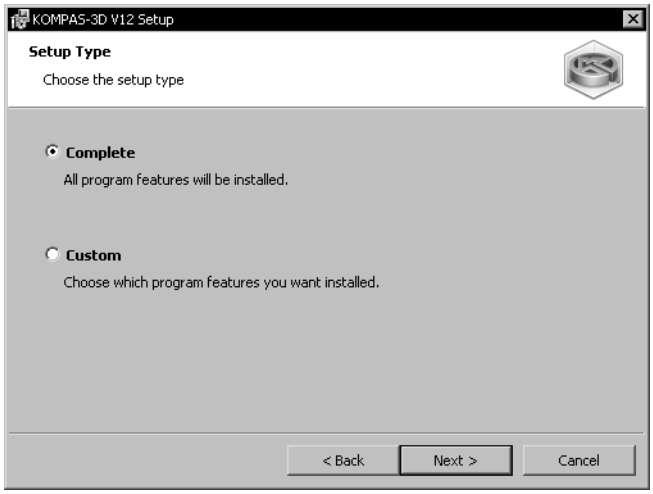


Fig. 4.1. Selecting the installation type

The first type means installation of all the system components on a computer. The second type means an option to select components to be installed (Fig. 4.2).

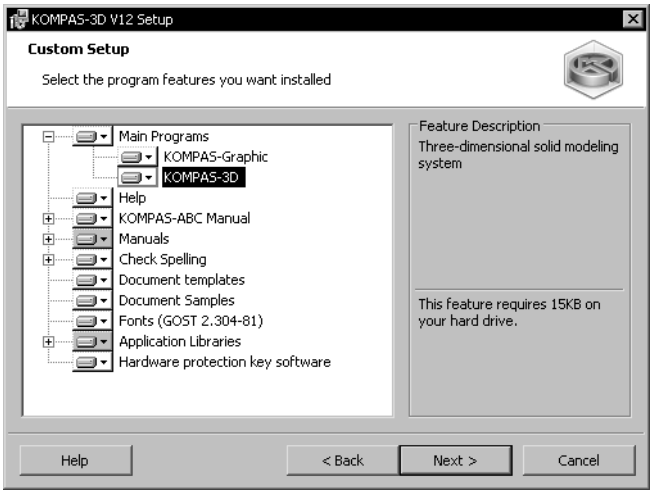


Fig. 4.2. Selection of system components

The installer will copy system files one-by-one from a CD to the specified folder on a computer HDD and then unpack them.

4. If, for some reason, you need to terminate the system installation before reaching its normal completion, click the **Cancel** button.

4.1.1. KOMPAS–Macro Application Library Installation Features

To install the KOMPAS-Macro Application Library, it is necessary to select this component in the KOMPAS system setup window (Fig. 4.3).

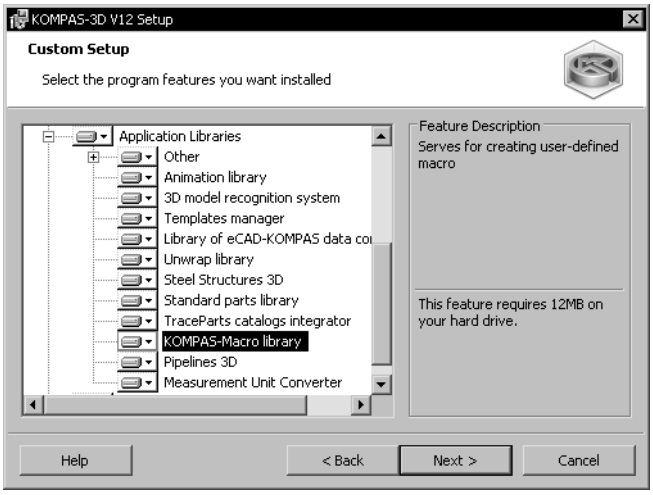


Fig. 4.3. Selection of system components

When installing the KOMPAS-Macro application library, the Pyton Pywin32 language extension is installed automatically.

4.2. Protection system software

The HASP SRM protection system software that enables the functioning of the protected application is automatically and unconditionally installed on a computer during KOMPAS-3D system installation.

4.3. Installing Fonts

When installing a KOMPAS-3D system, you automatically install fonts required for KOMPAS document layout (see Table4.1):

- Fonts containing characters whose style conforms to GOST 2.304–81 “Unified Design Documentation System. Drawing Fonts”,
- fonts containing special symbols.

Font files are copied to the *Fonts* system folder.

Table 4.1. KOMPAS-3D fonts

	True Type Fonts Font Name (file name)	The vector graphics fonts are Font Name (file name)
GOST 2.304–81 “Unified Design Documentation System. Drawing Fonts"	**GOST type A** *(gost_a.ttf)*	**GOST 2.304-81 type A** *(gost_a.fon)*
	GOST type B *(gost_b.ttf)*	**GOST 2.304-81 type B** *(gost_b.fon)*
	GOST type AU, Unicode font *(gost_au.ttf)*	
	GOST type BU, Unicode font *(gost_bu.ttf)*	
Special symbols	**Symbol type A** *(symbol_a.ttf)*	**Symbol type A** *(symbol_a.fon)*
	Symbol type B *(symbol_b.ttf)*	**Symbol type B** *(symbol_b.fon)*

4.4. Specifics of Working in KOMPAS–3D V12 on a PC under Windows Vista and Windows 7

4.4.1. System installation and updating, restoration of system settings

When installing, updating or restoring of system settings, user may face problems due to specific procedure of user account control (UAC). In this context, if the user account control is activated on your computer, we strongly recommend to disable this function during installation, updating or restoration of settings and then enable them again when the tasks are completed.

To disable (or enable) account control, complete the following steps.

1. Invoke the **Control Panel** command from the **Start** button menu.
2. Double click the **User Accounts**shortcut in the opened **Control Panel** window.
3. In the opened window **Change User Accounts** call the command **Disable/Enable User Account Control (UAC)**.
4. In the opened window **Disable/Enable user Accounts Control (UAC)** disable (or enable) option **Use User Accounts Control (UAC) for computer protection** for safety increasing.
5. Restart your computer.

During installation of KOMPAS-3D or configuration, the Windows® Installer termination message may appear. This message could appear if you have a previous (up to 4.5) version of Windows® Installer. To update your Windows® Installer complete the following steps.

1. Close the termination message and exit the KOMPAS-3D/configuration Installation Wizard.
2. Open folder *Support* of the KOMPAS-3D installation package and run the following file:

- *Windows6.0-KB942288-v2-x86.msu* for Windows Vista Business or Windows Vista Ultimate,
- *Windows6.0-KB942288-v2-x64.msu* for Windows Vista Business x64 or Windows Vista Ultimate x64.

Once the update is completed, restart installation of KOMPAS-3D or configuration.

4.4.2. Working with Help Systems of Applications and Libraries

Microsoft Windows Vista does not include a viewer for HLP files (files with the *hlp* extension) included in previous versions of Windows. As a result, you cannot use the Help System by default when working with some applications and libraries in KOMPAS-3D.

More detailed information is located at the Microsoft site:

http://support.microsoft.com/kb/917607/en-us

It is necessary to download the update for Windows from the Microsoft download center and install it on the computer in order to install Help viewer.

Download link:

http://www.microsoft.com/downloads/details.aspx?displaylang=ru&FamilyID=6ebcfad9-d3f5-4365-8070-334cd175d4bb

Authentication of installed Windows version is completed before the download. The authentication process is described in detail at the above site.

One of the following files (Table 4.2) will be copied to the hard drive, depending on the type of installed OS.

Table 4.2. Update file types for Windows Vista

	Russian version	English version
32-bit	Windows6.0-KB917607-x86.msu	Windows6.0-KB917607-x86.msu
64-bit	Windows6.0-KB917607-x64.msu	Windows6.0-KB917607-x64.msu

Run the *.msu file by any of the standard ways to install the update, for example, by double-clicking the file icon in the Window Explorer. As a result of the update, the *Winhlp32.exe* file will be saved in the Windows system folder. However, Windows default security settings prohibit running macros when help is scrolled. This limits help system possibilities, e.g., there will be no navigation bar, help search, etc.

You must perform the following actions to enable launch of macros:

1. Create the following keys in the registry:

▼ 32-bit version:

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WinHelp]

▼ 64-bit version:

[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\WinHelp]

2. Create the *AllowProgrammaticMacros of* of the *DWORD* type.
3. Set the parameter value to *1*.

More detailed information is located at the Microsoft site:

http://support.microsoft.com/kb/917607/en-us.

In order to automatically make necessary changes to the registry, you may also import data saved in files:

▼ 32-bit version: *AllowWinHelpMacros-Vista-x86.reg*,

▼ 64-bit version: *AllowWinHelpMacros-Vista-x64.reg*,

These files are available on the ftp-server using the following link:

http://download.kompas.kolomna.ru/public/util/AllowWinHelpMacros.zip

Once you have performed the indicated actions, WinHelp32 Help will be fully available.

4.5. Installing the Hardware Protection Key

The hardware protection key shall be inserted into a free USB port.

No additional actions (such as defining the port number or communication parameters, etc.) are required, as KOMPAS-3D system automatically checks whether the key is installed on a computer.

4.6. Removing KOMPAS–3D

Perform the following actions to remove KOMPAS-3D from a computer.

1. Invoke the command **Start — Options — Control Panel**.
2. Double click the **Add or Remove Programs** icon.
3. In the opened window, select the system name — KOMPAS-3D — and click the **Delete** button.
4. Confirm the deletion.

Before deletion is completed, you may cancel it by clicking the **Cancel** button.

When KOMPAS-3D is deleted, all system files are deleted from subfolders of the system root folder. Subfolders that became empty as a result of this are also deleted.

The following files are not deleted (remain on the disk in the same folders):

- Configuration files **.ini*, **.cfg*, **.dsk* and **.prj*,
- KOMPAS-3D fonts,
- hardware protection key software,
- files saved in the root system folder and subfolders (files of document templates, text templates, various libraries, etc).

When working with KOMPAS-3D, the user can change any package file of the line style library (**.lcs*), hatch style library (**.lhs*), template library (**.lyt*), fragment library (**.lfr*) and model library (**.l3d*). In addition, theuser may edit the user menu file (*Graphic.pmn*), the density directory file (*Graphic.dns*) and the file of codes and names (*Graphic.kds*).
When KOMPAS-3D is deleted, among other things all libraries of the distribution package are deleted, as well as the files *Graphic.pmn*, *Graphic.dns* and *Graphic.kds,* located in the *\SYS* subfolder of the root system folder, whether they were edited by the user or not. If these files need to be saved for some reason, you should create backup copies before deleting KOMPAS-3D.

Chapter 5.
System Settings

5.1. General Settings

When starting and while running the KOMPAS-3D system, besides the system files proper, other files are used, including configuration files (see Section 5.1.3 on p. 53), library files, templates, and various utility files. Default locations of these files and folders for temporary files and documents are stored in the system in the form of **KOMPAS-3D environmental variables** (see Section 5.1.1).

If the variable values are to be other than the default, one should use the configuration file *KOMPAS.ini* (see Section 5.1.2 on p. 51), containing the keys with the same names as the variables, and with the desired values. This file **is not included in the installation**. It is necessary to create it manually and put in the same folder where the *Kompas.exe* file is located.

When starting the KOMPAS-3D system, the *KOMPAS.ini* file is searched for only in the folder containing the file *Kompas.exe*. Therefore, having the *KOMPAS.ini* file in any other folder has the same effect as not having it at all.

5.1.1. KOMPAS–3D Environment Variables

This section contains names, descriptions and values of KOMPAS-3D environment variables.

Environment variables allow specifying paths to working directories of the KOMPAS system. The following parameters are used when these paths are described:

[Version] — system version number in the format “X.X”, for example: **10.0**.

[COMMON_APPDATA] — the folder containing data about applications, shared by all computer users

[APPDATA] — the folder containing data about applications for the current user *<User>*.

Depending on the operating system version, the **[COMMON_APPDATA]** and **[APPDATA]** parameters will take on values given in Table 5.1.

Table 5.1. Values of the parameters **[COMMON_APPDATA]** and **[APPDATA]**

OS version	The value of the parameter
	[COMMON_APPDATA]
Windows XP, Windows XP x64	*C:\documents and settings\all users\application data*
Windows Vista, Windows Vista x64	*C:\ProgramData*
	[APPDATA]

Table 5.1. Values of the parameters **[COMMON_APPDATA]** and **[APPDATA]**

OS version	The value of the parameter
Windows XP, Windows XP x64	*C:\documents and settings\[user]\application data*
Windows Vista, Windows Vista x64	*C:\Users\<User>\AppData\Roaming*

List of KOMPAS-3D environment variables

- **CFG**

  Specifies the name of the **.cfg* configuration file and its path. The folder containing the **.cfg* system file also contains and enables lookup for the library configuration files.
  CFG = [APPDATA]\Ascon\Kompas-3D\[version]\Kompas.cfg

- **PRJ**

  Specifies the name of the **.prj* configuration file and its path.

  PRJ = [APPDATA]\Ascon\Kompas-3D\[version]\Kompas.prj

- **DSK**

  Specifies the name of the **.dsk* configuration file and its path.

  DSK = [APPDATA]\Ascon\Kompas-3D\[version]\Kompas.dsk

- **SYS**

  Indicates the folder containing the system files: User Menu files, tolerances, a material density reference file, libraries of styles, etc. If the required system file is not found in this folder, the user will be prompted to specify the explicit path to the file. When setting up text templates, libraries of apertures and sketches, then by default, this folder is offered for placement of *graphic.tdp*, *holelib.lfr* and *skchlib.lfr* files.

  When starting KOMPAS-3D, the system checks for the folder *[APPDATA]\Ascon\Kompas-3\[version]\Sys*. If it is found, then
  SYS=[APPDATA]\Ascon\Kompas-3D\[version]\Sys

  If it was not found, then the system looks for the folder *[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Sys* . If it is found, then
  SYS= [COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Sys

  If it was not found, the folder *Sys* is looked up using a path relative to the *Kompas.exe* file, i.e., in the folder containing the folder with the *Kompas.exe* file. If the *Sys* folder is found by the relative path, then
  SYS=..\Sys

  If the *Sys* folder was not found by the relative path, then the SYS environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

- **LIBS**

  Indicates the folder containing library files. This folder will be by default offered first when adding libraries to the Library Manager.

When starting KOMPAS-3D, the system checks for the folder *[APPDATA]\Ascon\Kompas-3\[version]\Libs*. If it is found, then

LIBS=[APPDATA]\Ascon\Kompas-3D\[version]\Libs

If it was not found, then the system looks for the folder *[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Libs* . If it is found, then

LIBS=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Libs

If it was not found, the *Libs* folder is looked up using a path relative to the *Kompas.exe* file, i.e., in the folder containing the folder with the *Kompas.exe* file. If the *Libs* folder is found using a relative path, then

LIBS=..\Libs

If the *Libs* folder was not found by the relative path, then the LIBS environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

- **TEMPLATES**

Indicates the folder containing KOMPAS document template files. When creating a document, the templates located in this folder will be offered. The same folder shall be offered by default for placing of the newly created templates.

When starting KOMPAS-3D, the system checks for the folder *[APPDATA]\Ascon\Kompas-3\[version]\Templates*. If it is found, then

TEMPLATES=[APPDATA]\Ascon\Kompas-3D\[version]\Templates

If it was not found, then the system looks for the *[COMMON_APPDATA]\Ascon\Kom pas-3D\[version]\Templates* folder. If it is found, then

TEMPLATES=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Templates

If it was not found, the folder *Templates* is looked up using a path relative to the *Kompas.exe* file, i.e., in the folder containing the folder with the *Kompas.exe* file. If the *Templates* folder is found using a relative path, then

TEMPLATES=..\Templates

If the *Templates* folder was not found by the relative path, then the TEMPLATES environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

- **PROFILES**

Specifies which folder contains profile files (see Section 5.3 on p. 57). When selecting profiles, those located in this folder will be shown. The same folder will be offered by default for placing the newly created profiles.

When starting KOMPAS-3D, the system checks for the folder *[APPDATA]\Ascon\Kompas-3\[version]\Profiles*. If it is found, then

PROFILES=[APPDATA]\Ascon\Kompas-3D\[version]\Profiles

If it was not found, then the system looks for the *[COMMON_APPDATA]\Ascon\Kom pas-3D\[version]\Profiles* folder. If it is found, then

PROFILES=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Profiles

If it was not found, the *Profiles* folder is looked up using a path relative to the file *Kompas.exe*, i.e., in the folder containing a folder with the *Kompas.exe* file. If the *Profiles* folder is found using a relative path, then

PROFILES=..\Profiles

If the *Profiles* folder was not found by the relative path, then the PROFILES environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

▼ **TEMP**

Indicates the folder to hold temporary files, as well as document files that were automatically saved during a KOMPAS-3D session. When setting Auto Save options (see Section 5.5 on p. 59), this folder will be offered as the system folder for temporary files.

TEMP=%TEMP%

If the TEMP (TMP) environment variable is defined for the current user, then that variable will be used. For example, TEMP="%USERPROFILE%\Local Settings\Temp".

Otherwise, the system TEMP (TMP) variable is used. For example, TEMP=%SystemRoot%\TEMP .

▼ **WORK**

Indicates the folder to hold KOMPAS documents. This folder will be offered by default the first time you open or save a document.

WORK="%USERPROFILE%\My Documents"

▼ **SHEETMETAL**

Indicates the folder containing bend table files. When selecting bend tables, the tables located in this folder will be shown. The same folder shall be offered by default when writing a bend table from part into the file.

When starting KOMPAS-3D, the system checks for the *[APPDATA]\Ascon\Kompas-3D\[version]\Sheetmetal* folder. If it is found, then
SHEETMETAL=[APPDATA]\Ascon\Kompas-3D\[version]\Sys\Sheetmetal

If it was not found, then the system looks for the *[COMMON_APPDATA]\Ascon\Kom pas-3D\[version]\Sys\Sheetmetal* folder. If it is found, then
SHEETMETAL=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Sys\Sheetmetal

If it was not found, the folder *Sys\Sheetmetal* is looked up using a path relative to the *Kompas.exe* file, i.e., in the folder containing the folder with the *Kompas.exe* file. If the *Sheetmetal* folder is found using a relative path, then
SHEETMETAL=..\Sys\Sheetmetal

If the *Sheetmetal* folder was not found by the relative path, then the SHEETMETAL environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

▼ **PARTLIB**

It specifies, in what folder the Standard Items Reference model files are located.

When starting KOMPAS-3D, the system checks for the *[APPDATA]\Ascon\Kompas-3D\[version]\Libs\Partlib\Vault* folder. If it is found, then
PARTLIB=[APPDATA]\Ascon\Kompas-3D\[version]\Libs\Partlib\Vault

If it was not found, then the system looks for the *[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Libs\Partlib\Vault* folder. If it is found, then
PARTLIB=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Libs\Partlib\Vault

If it was not found, the *\Libs\Partlib\Vault* folder is looked up using a path relative to the *Kompas.exe* file, i.e., in the folder containing a folder with the *Kompas.exe* file. If the *Partlib* folder is found by the relative path, then

PARTLIB=..\Libs\Partlib\Vault

If the *PARTLIB* folder is not found using a relative path, the PARTLIB environment variable takes on a value containing a path to the folder with the *Kompas.exe* file.

- **MULTILINETEMPLATES**

  Indicates the folder containing the multiline template files. When creating multilines, the templates located in this folder shall be offered. The same folder shall be offered by default for placing of the newly created templates.

  When running KOMPAS-3D, the system checks for the *[APPDATA]\Ascon\Kompas-3D\[version]\Templates* folder. If it is found, then
  MULTILINETEMPLATES=[APPDATA]\Ascon\Kompas-3D\[version]\Templates

  If it is not found, then the system looks for the *[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Templates*folder. If it is found, then
  MULTILINETEMPLATES=[COMMON_APPDATA]\Ascon\Kompas-3D\[version]\Templates

  If it is not found, the folder *Templates* shall be looked up using a path relative to the *Kompas.exe*file, i.e., in the folder containing the folder with the *Kompas.exe*file. If the *Templates*folder is found using a relative path, then
  MULTILINETEMPLATES=..\Templates

  If the *Templates* folder is not found by the relative path, then the MULTILINETEMPLATES environment variable gets the value containing a path to the folder with the *Kompas.exe* file.

5.1.2. Structure and Syntax of the File KOMPAS.ini

KOMPAS.ini is a text file with data defining various system parameters.

Those data are laid out as key values arranged by sections. Sections and keys are described in the Table 5.2.

Table 5.2. Sections and keys of the file KOMPAS.ini

[Section]/key	Description
[Directories] **CFG** **PRJ** **DSK** **SYS** **LIBS** **TEMPLATES** **PROFILES** **TEMP** **WORK** **SHEETMETAL** **PARTLIB** **MULTILINETEMPLATES**	Contains information about paths to configuration and system files, as well as to folders for documents and temporary files. Key names and meaning in this section coincide with names and meaning of the KOMPAS-3D system environment variables (see Section 5.1.1).
[Protection]	Contains information about the specifics of passing data to a peripheral device. The presence of the section is meaningful only when the key is installed on the computer, with a peripheral device attached to it.
PausePrinting	The **YES** value suspends output to a peripheral device upon KOMPAS-3D querying the HASP key, and **NO** value resumes output.
[Windows]	Contains information about displaying the startup KOMPAS-3D screen image when starting the system.
ShowSplash	The **YES** value turns on the startup image displaying, and **NO** value turns it off.
[Bmp]	Contains information about the maximum block size for printing bitmap and grayscale images.
MaxBlockSize	Specifies the maximum block size (in hundreds of kilobytes). For example, if the key is equal to 10, then bitmap and grayscale images are output by blocks at 1000 kilobyte (1 MB). If the key value is less than or equal to 0, the entire drawing is output in one pass.
[FontEscapement]	Contains information about the text printing method.

Table 5.2. Sections and keys of the file KOMPAS.ini

[Section]/key	Description
TextAsBitmap	The **YES** value turns on text character output as a bitmap, and **NO** turns it off. Switching to outputting the text as a bitmap would fix problems with outputting True Type fonts supplied with the system, when using certain plotters (for example, Calcomp 720C).

In the *KOMPAS.ini* file for specifying the locations of folders and files, you can use either absolute paths (for example, SYS=C:\Program Files\Ascon\KOMPAS-3D V...\Sys), or relative paths with respect to the folder containing *KOMPAS.ini* and *Kompas.exe* files (for example, SYS=..\Sys).

Additionally, when defining paths, it is possible to use system variables (for example, TEMP=%TEMP%).

Lines starting with a semicolon character (;) are considered to be comments and are not processed when processing the *KOMPAS.ini* file.

If a key value contains a space character, it should be within quotes (for example, TEMP="D:\Working materials\Temporary files").

Sample *KOMPAS.ini* file:

```
[Directories]
SYS=..\Sys
LIBS=..\Libs
Templates=..\Templates
CFG=%APPDATA%\Ascon\Kompas-3D\[version]\tuning.cfg
PRJ=%APPDATA%\Ascon\Kompas-3D\[version]\new.prj
DSK="%USERPROFILE%\Local Settings\Application Data\Ascon\Kompas-3D\[version]
\desktop.dsk"
Profiles="%ALLUSERSPROFILE%\Application Data\Ascon\Kompas-3D\[version]\Profiles"
TEMP=%TEMP%
WORK="%USERPROFILE%\My Documents"
MULTILINETEMPLATES=..\Templates
[Windows]
SHOWSPLASH=YES
```

5.1.3. Configuration Files

Configuration files are **.cfg*, **.prj* and **.dsk* files.

These files store the following information (see also Table 5.3 on p. 55):

- **.cfg* — system settings,
- **.prj* — new document settings,
- **.dsk* — working window settings.

There are no configuration files immediately after system installation. They appear when the settings are first changed and saved.

The configuration files are overwritten each time appropriate settings are changed (if configuration saving is enabled).

For more information on setup management see Section 5.2 on p. 54.

If those configuration files are missing (for example, at first launch of the KOMPAS-3D system), then default configuration parameters for the system are used.

5.1.4. Viewing Paths to System Folders and Files

At any time you work with the system, you can obtain data on location of the *KOMPAS.ini* file, configuration files, folders for temporary and system files, and folders for document, library, template, and profile files. For this, invoke the **Service — Options... — System — Files — Location** command. The opened dialog displays (Fig. 5.1) current paths to the abovementioned files and folders.

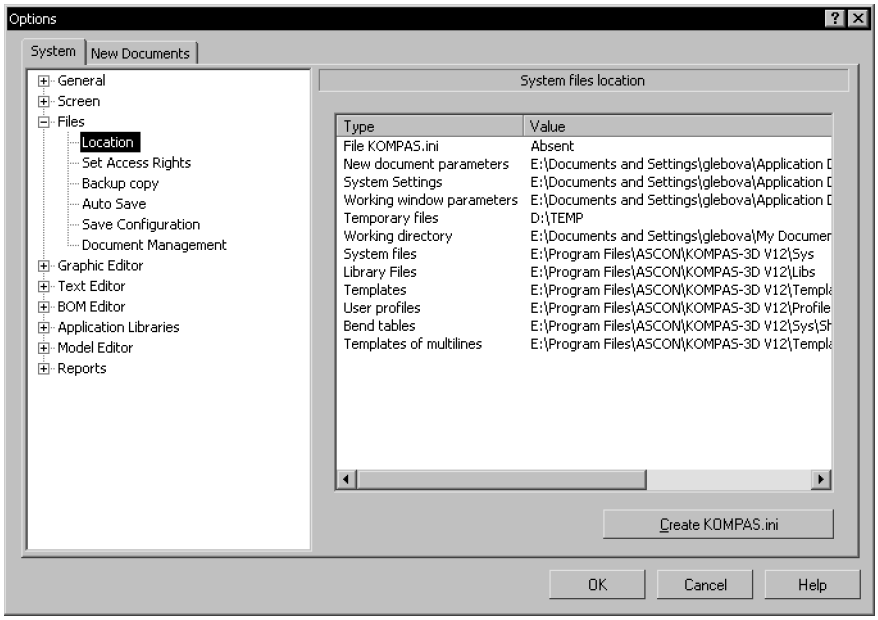


Fig. 5.1. System File Location View dialog

You can also create or edit the *KOMPAS.ini* file using this dialog.

A new newly created or edited *KOMPAS.ini* file will be used in the next KOMPAS-3D session.

5.2. Profile Configuration

Setting up KOMPAS-3D system configuration includes three groups of settings. These groups are presented in Table5.3.

Table 5.3. KOMPAS-3D configuration setting groups

Group	Description
System Settings	Settings are made on the **System** tab of the General Parameters dialog*. If saving the settings of this group is enabled, those are stored in the **.cfg*** file.
New Document Settings	Settings made on the **New Documents** tab of the General Parameters dialog*. If saving the settings of this group is enabled, those are stored in the **.prj* file.
Working window settings	Main system window appearance preferences: ▼ Main Window Size, ▼ Interface settings made in the **Screen — Customizing interface** section on **System** page of the general setup dialog, ▼ Application View, ▼ Status of open documents (window size and position, cursor step, scale, local snap settings, grid, scroll bars), ▼ Location and composition of the menu bar and toolbars (including the user-defined ones), ▼ position and size ▼ Property Bars, ▼ Variables Management window, ▼ Information window, ▼ Text Templates Librarian window, ▼ Library windows, ▼ Document Manager and Layer Filter Settings dialog, ▼ Library Manager, ▼ Library Manager structure, ▼ Status of each library: connected or detached. If saving the settings of this group is enabled, those are stored in the **.dsk**** file.

* The dialog invoked by the **Service — Options...** command.

** This file does not store information displayed in the dialog of viewing system files and folders.

*** This file does not store the information about the contents of the **View** and **Current Status** bars in the following modes: when editing a local excerpt, editing specifications, or editing BOM items in a graphics document. Changes to the content of the said bars are maintained in these modes only through the end of the working session.

Managing saving each of the groups is done in the Configuration Saving Parameters dialog (Fig. 5.2). Use command **Service — Options... – System – Files – Save Configuration** to activate this dialog.

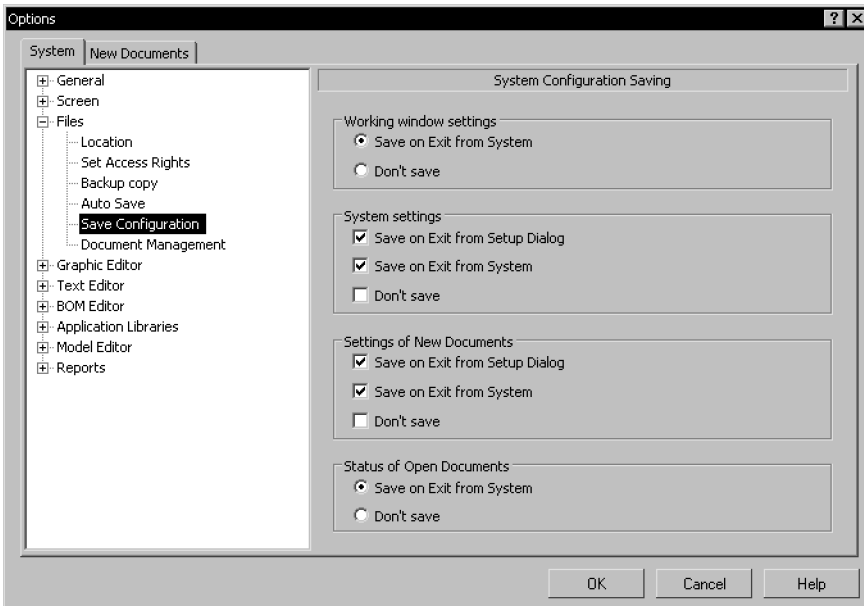


Fig. 5.2. Configuration Saving Options dialog

Existing configuration settings can be saved in a profile file (see Section 5.3). Subsequently applying this profile will allow quickly changing the current setting to the one stored in the profile.

Note that only the settings that have been modified from the default are stored in the and **.cfg* and **.prj* files and in the profile file. Unchanged parameter data is not written.
Default values will be assigned when reading and **.cfg* and **.prj* files or applying a profile to the parameters having no reference information. At that, a default path to the *SYS* folder is retrieved from the *KOMPAS.ini* file (see Section 5.1.2 on p. 51) and when there is none available it is determined by the value of the corresponding KOMPAS environment variable (see Section 5.1.1 on p. 47).

The data that is not related to the system setup but is necessary for running KOMPAS is stored in the Registry. This includes the following information:

- User information,
- List of recently opened files,
- The current screen resolution (this data is necessary for positioning the main system window).

Current document settings (settings made on the **Current Document** tab of the Common Properties dialog) are stored in the document itself. Due to this, they do not change in transferring documents from one workstation to another.

5.3. User Profiles

A profile is a collection of data about system configuration settings.

Using profiles, you can quickly redefine the current system configuration.

For instance, you can create a 3D modeling profile, i.e., a profile containing settings which are the most convenient in working with 3D models, a design documentation elaboration profile, etc. Then, to set up the system for performing a particular task, you will just need to apply the appropriate profile.

To save current configuration settings in a profile file, complete the following steps.

1. Call the **Service — Profiles...** command.
2. In the dialog that appears, set the options corresponding to the groups of settings that must be saved in the profile.
3. Click the **Save As...** button.
4. In the dialog that appears, specify the name and define the location of the profile file. A profile file extension is *pfl*.

The profile file does not record the names of the last opened documents, nor does it record the configuration of the open document windows.

To remove an existing profile file, complete the following steps.

1. Call the **Service — Profiles...** command.
2. In the dialog that appears, select a profile from the **Profiles** list.
3. Set the options for the groups of settings you need to use.
4. Click the **Apply** button.
5. The specified settings will be applied.
6. Click the **Exit** button.

The KOMPAS-3D installation package includes several ready-made profile files. Those are located in the *Profiles* subfolder of the main system folder.

When using ready-made profile files, keep in mind that they do not contain the references to libraries. Therefore, once any such profile has been applied, the current contents of the Library Manager are deleted, and the Manager fills automatically according to the **.lms* files located in the *Sys* subfolder of the system root folder.

The **.lms* files contain data on the Library Manager components (names of sections, subsections and lists of libraries included). These files are used for primary filling and updating of the Library Manager. Files are in text format, so you can open them in any text editor and change information stored in them, if necessary.

5.4. Backup Copying

Backup copying ensures maximum integrity of documents. Hence, it is recommended to always use at least one of the possibilities of backup file saving.

You can configure the backup copying in the dialog (Fig. 5.3), invoked by the **Service – Parameters – System – Files – Backup Copying** command. The dialog controls are shown in Table5.4.

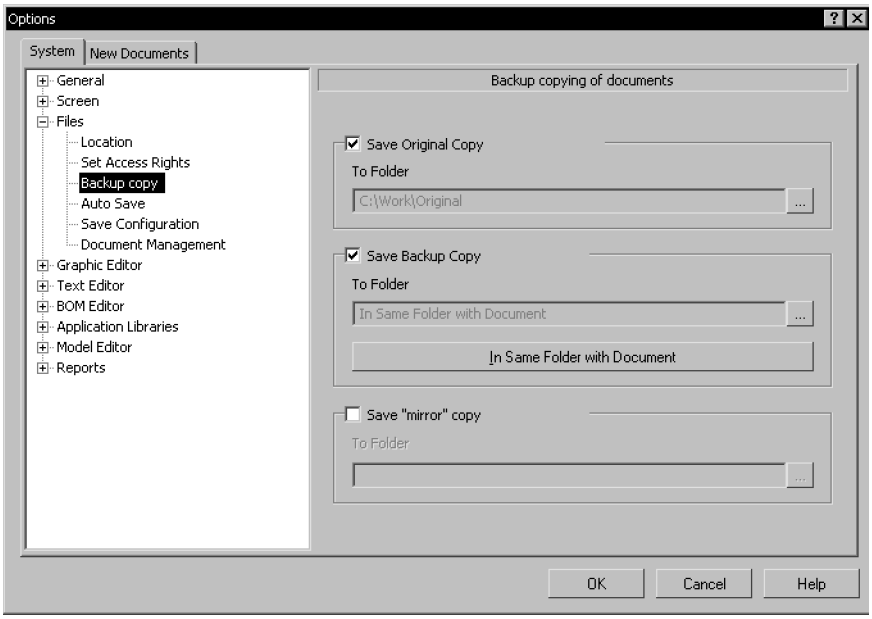


Fig. 5.3. Dialog of Backup Copy Settings

Table 5.4. Dialog of Backup Copy Settings

Element	Description
Save Original Copy	When a changed document is first saved during the current working session, its original copy will be saved in the specified folder.
Browse...	The button allows specifying the folder to save the original copy of the document. The button is available if the **Save Original Copy** option is enabled. Once the folder has been specified, a full path to it is displayed in the **To Folder** field.
Save Previous Copy	Each time a document is saved, its previous copy will be saved in the specified folder. If a folder is not specified, the previous copy is saved to the same folder as the document itself. Here, the copy is saved with the same name but with the **.bak* extension.
Browse...	The button allows specifying the folder to save the previous copy of the document. The button is available if the **Save Previous Copy** option is enabled. Once the folder has been specified, a full path to it is displayed in the **To Folder** field.

Table 5.4. Dialog of Backup Copy Settings

Element	Description
In Same Folder with Document	The button allows you to clearly cancel saving the previous copy in the folder specified with the **Browse...** button. Once the **In Same Folder with Document** button has been clicked, the **To Folder** field is cleared.
Save "Mirror" Copy	Mirroring is an additional means of backup data saving. A mirror copy is a file of the document which is saved in another folder at the same time, e.g. on a fail-safe remote server disk. If mirroring is enabled, then each time a document is saved, its duplicate will be saved in the specified folder.
Browse...	The button allows specifying the folder to save the mirror copy of the document. The button is available if the **Save "Mirror" Copy** option is enabled. Once the folder has been specified, a full path to it is displayed in the **To Folder** field.

Folders specified for backup copies create a folder structure corresponding to the location of the master document file on the disk when files are saved. The name of the upper folder in the created structure corresponds to the name of the disk where the master file is saved. For instance, the *First.cdw* drawing is saved in the *C:\Work* folder and *D:\Reserve* is specified as a folder to save the copy. A full path to the document copy file will be *D:\Reserve\C\Work\First.cdw*.

It is not recommended to specify identical folders to save backup copies of different types, as this can result in information loss. A warning message will be displayed when you try to finish setting backup copying with such parameters (Fig. 5.4).

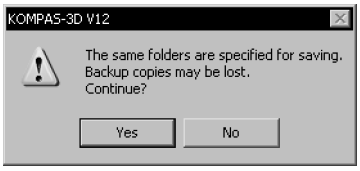


Fig. 5.4.

Buttons with this message allow you to confirm or cancel the setting. When canceling, you can change backup copy folders. Backup copying will proceed if the setting is confirmed. At that, only one file is created similar to the current state of the saved master file.

5.5. Auto Save

5.5.1. Setting Auto Save

Auto save is set up in the dialog (Fig. 5.5) invoked with the **Service — Options... — System — Files — Auto Save** command. The dialog control components are shown in Table 5.5.

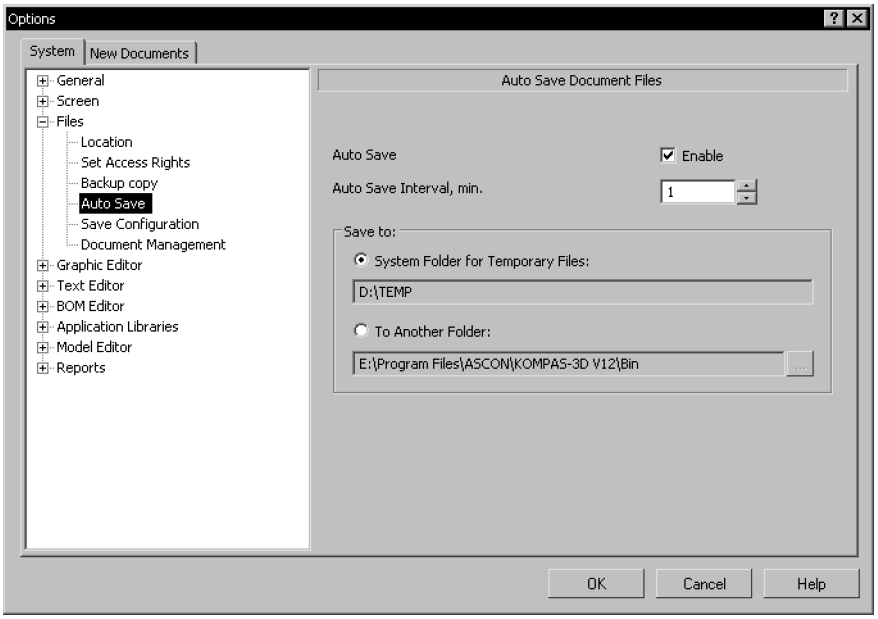


Fig. 5.5. Auto Save Settings dialog

Table 5.5. Auto Save Settings dialog

Element	Description
Auto Save	Document auto save ensures maximum integrity of working results when various failures occur (abnormal exit from the system, electrical power interruptions, computer hardware errors, etc). So, it is recommended to always enable auto save when you work with the system. For this, you should activate the **Enable** option. If auto save was enabled and the system operation ended abnormally, all documents edited during the previous session would be restored at restart.
Auto Save Interval, min.	A time interval between the previous and the next auto save.
Save to:	Auto save is made by default into the system folder of temporary files. You may change the auto save folder by selecting **To Another Folder** and specifying a full path to this folder by clicking the **Browse...** button.

5.5.2. Auto Save Files

Auto save files are created as follows. If auto save is enabled, an auto save file is created for the document edited during the current working session after the specified period of time elapses. It contains a document with changes made after its creation or the last invocation of the **File** — **Save** command, i.e., the last saving to the disk.

Auto save file names are produced automatically by the following template:

<k> + <KOMPAS system version number> + <random set of six Latin characters>.

An auto save file name extension is generated according to the document type.The last extension character is replaced by the *$* symbol.

For instance, an auto save file for the excerpt edited in KOMPAS system V9 can have the name *k9cxfhme.fr$*.

After the next specified period of time elapses, auto save file contents are compared to the current document. If changes are found, the auto save file is overwritten. If there are no changes, the file remains the same.

When a document is saved with the **File** — **Save** command, the auto save file is deleted and the cycle repeats.

If the system exits prematurely, then the auto save file will not be deleted. Upon a subsequent start of KOMPAS-3D, that file will be automatically used to restore the document.

5.6. Restoring KOMPAS System Documents

5.6.1. Using Backup Files

If you specify folders to save backup files different from folders to save a document, these files have standard names and extensions. They can be opened in a standard way.

If the previous document copy file is saved in the same folder as the document, its name will be the same and the extension will be *bak* instead of that corresponding to the file type.

For example, there are two files in the folder: *val.cdw* and *val.bak*. The file *val.cdw* keeps the latest document version, i.e., anything that was created before the last save, by calling the **File** — **Save** command. The *val.bak* file keeps the previous document version, i.e., anything that was created before the second from last save.

So, when documents are lost, the files having the *bak* extension allow you to **partially** restore information.

You can use the following methods to open the backup copy file having the *bak* extension in KOMPAS system.

▼ Launch KOMPAS-3D system and invoke the **File** — **Open** command. In the displayed File Open dialog, select the **All files(*.*)** line from the *File type* list, and the required file (files) from the file list that has the *bak* extension. The KOMPAS system will determine the document type saved in the backup copy and will open it. Save currently opened files with the **File** — **Save as...** command. Files to be saved will be automatically assigned the extension corresponding to the document type.

The KOMPAS-3D system is not associated with files having the *bak* extension as suitable for opening the program. That is why double clicking a **.bak* file in Windows Explorer does not automatically launch KOMPAS-3D. A dialog is displayed to select a program. Specify the *KOMPAS.exe*executable system file as a program to open the file.KOMPAS system will be launched and will open the selected file.

It is not recommended to enable the **Always Use This Program to Open These Files** option in the Program Selection dialog. Backup copy files of the documents having the *bak* extension are created by various programs. If the KOMPAS system is associated with files having the *bak*

extension, an error message will be displayed when you try to open such a file saved by other programs.

- The second method to open a backup copy file is to preliminarily change its extension according to the document type saved in this file. In Windows Explorer, change the *bak* extension to the extension which corresponds to the file type preserved in the *.bak file. And then open the file in the KOMPAS-3D system in the standard manner. If you do not know the type of the document recorded in the backup copy file, then set its extension to that of any KOMPAS document: *frw*, *cdw*, *spw*, *kdw*, *m3d* or *a3d*. After that, you will be able to open and view that file in the KOMPAS-3D system. If the selected extension turns out to be incorrect, close the file and change the extension. You can also save the document under a different name by calling the command **File — Save As...** In this case, the system will automatically determine the document type and offer the extension corresponding to that type.

5.6.2. Use of Auto Save Files

Recovery of documents after a premature ("emergency") system exit is done automatically from the auto save backup files.

To do this, launch the KOMPAS-3D system by any method except double-clicking in the Windows Explorer on the name of the file that was edited or was opened at the time of the premature exit.

Why shouldn't you start KOMPAS-3D by clicking on the name of this file? This is because the document will not be restored in such a case. When the file opens, it represents the state of the document at the time of the last (before the premature exit) invocation of the command **File — Save** (at the time when it was last saved on disk). Obviously, by setting up a relatively short auto save interval, you would have a higher probability of having more changes saved in the auto save file than in the last version of the document that was saved manually.

After loading the system correctly, a search is run for auto save files in the folder specified for saving such files. The corresponding documents are restored from all found files. The auto save files, from which the documents were restored, are deleted.

The heading "(recovered)" is displayed in the title of a recovered document window. It stays until the first editing of the document.

To write the restored document to disk, call the **File — Save** command (to save to the same file as the one used before the premature system exit), or the **File — Save As...** command (to save to a new file).

If the system was launched by double-clicking a file that was edited at the time of the premature exit (let us call it the X file), then the document contained in this file (X document) will not be restored : the X document opens in the same way as was last saved on disk. If other documents were also open at the time of a KOMPAS-3D premature exit, those will be restored. All auto save files except the one corresponding to the X file will be deleted. That auto save file stays in its place and does not change, whatever operations are done to the X file.

Therefore, after an "incorrect" start, you need to complete the following steps.

1. Save all restored documents.
2. Close the X document without saving.
3. Close the system.

4. Start the system by an alternative method.
5. Save the X document, restored from the auto save file corresponding to the X file.

5.7. Setting Access Rights

You can set up rights for accessing linked files (style libraries, attribute type libraries, layout libraries, etc.) and activate control for modifications of the linked files, and insertion source files by the external link (fragments, base parts, etc.), and documents being opened for reading.

File access rights are set up in the dialog (Fig. 5.6) invoked with the **Service — Options... — System — Files — Set Access Rights** command. The dialog control components are shown in Table 5.6.

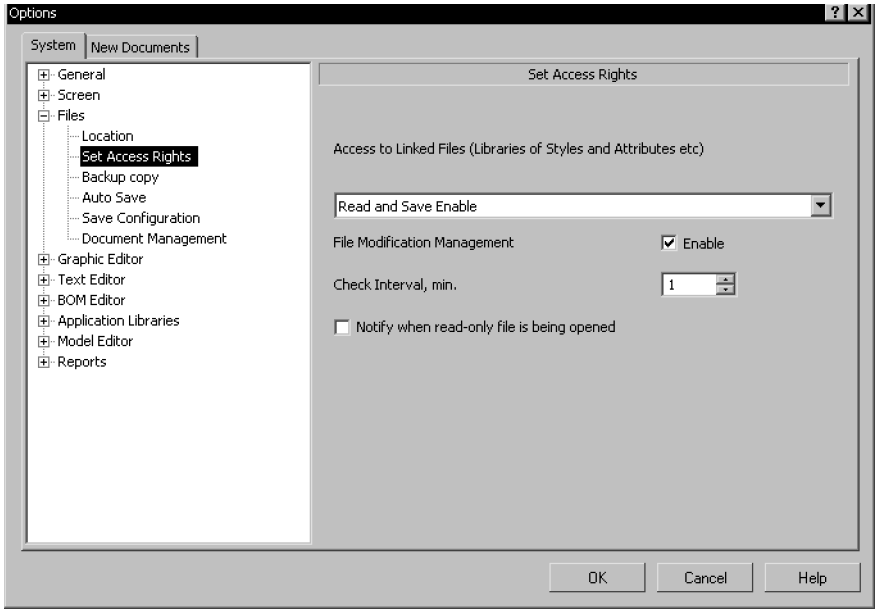


Fig. 5.6. Access Rights Setup Dialog

Table 5.6. Access Rights Setup Dialog

Element	Description
Level of Access to Linked Files	The list allowing you to set up access rights to linked files (style libraries, attribute type libraries etc). Access level variants are shown in Table 5.7.
File Modification Management	This option managers changes in shared files as well as in read-only files. Enabling this option means that the system will check whether the file has been modified by any other user. In case of a positive check result, a message will be displayed offering to reread the file (example see Fig. 5.7).

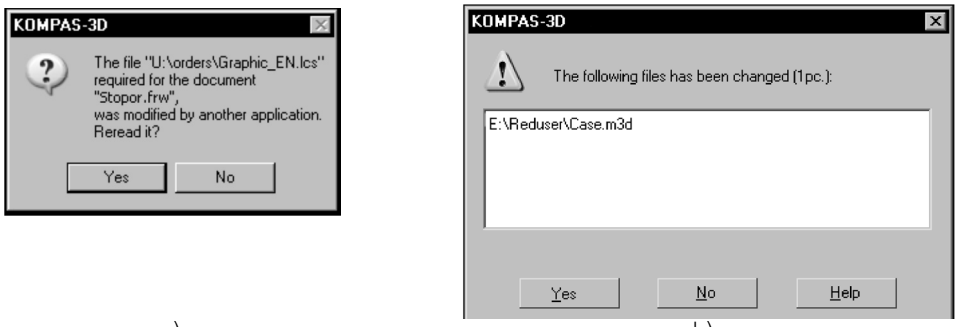
Table 5.6. Access Rights Setup Dialog

Element	Description
Check Interval, min	A time interval between checks.
Notify when opening read-only files	The option allows you to control notifications when you open read-only files. This option is available if control for modifying files is enabled. Notifications are disabled by default.

Table 5.7. Access Level to Linked Files

Level	Description
Enable Reading	Makes the files that are linked to documents opened on your workstation to be read-only for other workstations. For example, if you opened a drawing that uses a line style from any library then other users (at other workstations) may also use styles from this library but not change them. Moreover, they can copy the line style library that you are currently using but they cannot rename or delete it. Once the drawing that uses a library is closed, that library shall become fully available for other users.
Enable Reading and Writing	This option allows other workstations to read, edit and save the files that are linked to documents opened on your workstation. If the **File Modification Management**option is enabled, you shall receive a notification about any modifications to the linked file made by any other user (Example : see Figure 5.7, a).

Examples of notifications of shared files modifications are given in the Figure 5.7.



a) b)

Fig. 5.7. Message: a) on modification of a line style library; b) on modification of a model opened for reading

▼ Figure 5.7 a) gives an example of message that contains notification on a line style library modification.

▼ Button **Yes** allows to immediately receive a modified style from the library. For instance, another user has edited the line style library by changing the color of style No.5. If a

document opened on your computer has lines of this style, their color will change as a result of library rereading.

- The **No** button allows to refuse rereading of the file. It means only that the document shall not be reread immediately. When opening a document that uses a linked file, all changes made in this file shall be unconditionally transferred to the opened document.

- Figure 5.7 b) gives an example of message that contains notification on modifications of the read-only model opened on your computer.
  - The **Yes** button confirms rereading. In this case the model shall be reopened in the format last saved by the previous user. Note that this model shall remain read-only on your computer but all changes made prior to rereading shall be lost.
  - The **No** button allows to refuse rereading of the file. In this case no modifications of the opened model shall be done.

  Thus, if you need to save any changes to the opened read-only model, press the **No** button and then save the model under a new name. If you have made no changes or if you don't want to save the modifications, press the **Yes** button.

In case any other user changes the source document of external link (e. g. fragment or base part) messages similar to those shown in Figure 5.7 b) shall be displayed. Buttons **Yes** and **No** shall function in the same manner as during modifications of a style library: **Yes** button means immediate rereading of the source, and **No** button postpones rereading.

5.7.1. Satellite Files

After a KOMPAS document is opened for editing, its satellite file is automatically created.

A satellite file is a service file and located in the same folder as the opened document.

A satellite file name is generated according to the following rules:

- ~$ symbols are added to a document name and are prefixed if the document name contains no more than 6 characters;
- ~$ symbols replace the first and second characters if a name contains more than 6 characters;
- ~ symbol replaces the last character of a document file extension.

For instance, the *SAM.A3D* document will have the *~$SAM.A3~* satellite file and the *SAMPLE_1.A3D* document will have the *~$MPLE_1.A3~* satellite file.

The presence of a satellite file in a folder indicates that a KOMPAS document is already in use and will be available in read-only mode for reopening.

A satellite file contains text information about the user opening the document for editing and an index number identifying the document at the time of opening.

A satellite file is automatically deleted from a file folder after the document opened for editing has been closed.

In case of abnormal exit from the system, satellite files are not automatically deleted. Sometimes they may prevent reopening a document (a message is displayed about opening a read-only file). In this case, it is recommended to manually delete satellite files in Windows Explorer.

When a KOMPAS document is opened for reading, a satellite file is not created.

5.8. Recommended Setting of KOMPAS–3D System during Team Work

This section gives some recommendations for organization of team work of KOMPAS system users. Before starting to follow these recommendations, you should read the previous sections of Chapter4.

Using the offered recommendations allows you to organize your work in KOMPAS system so that the following requirements are met.

- Uniform layout of all issued documents (both paper and electronic): some companies have their own standards for documents, corporate templates, forms, etc.
- Central document storage.

Perform the following actions to set up KOMPAS-3D system for team work.

1. Arrange a sharable resource on any networked computer, e.g., on the server. It must be divided into four parts.
   - Folder for original documents.
   - Folder for backup document copies.
   - Folder for configuration files.
   - Folder for system files.
2. Connect the created shared source to KOMPAS workstations as a **network drive** .This will simplify changing the resource location, if required.
3. Set up the KOMPAS system on one of the workstations in the required manner. Pay special attention to the following setting objects.

- Setting access rights (see Section 5.7 on p. 63).
- Backup copying (see Section 5.4 on p. 57). In order to set the location for copies, specify subfolders of the folder for backup copies located on the sharable resource.
- Document Management. It is recommended to disable the **Convert Document Names to UNC** option in the Document Control Setting dialog.

  System settings will be saved in the **.cfg* file. Its default name is *KOMPAS.cfg*.

4. Move the **.cfg* file, containing settings that were made, to the configuration file folder located on the shared source.
5. On one of the KOMPAS workstations, set up document layouts, styles, text templates, user menus and other system files of the distribution package (by default all these files are located in the *SYS* subfolder of the system root folder). You may create your own template and style libraries, if necessary.
6. Move all contents of the *SYS* folder (including files you edited or created) to the system file folder located on the shareable resource.
7. Set up new documents, subject to document requirements in your company.

   New document settings will be saved in the **.prj* file. Its default name is *KOMPAS.prj*.

To make settings listed in Paragraphs 5and 7, you are required to be experienced in the KOMPAS system.

8. Move the **.prj* file containing settings that were made, to the configuration file folder located on the shared source.
9. Create the *KOMPAS.ini* file with the **[Directories]** section.
   9.1. Specify a path to the ***.cfg** file in the *CFG* key.
   9.1. Specify a path to the ***.prj** file in the *PRJ* key.
   9.2. Specify a path to the system file folder in the **SYS** key.
   9.3. Specify a path to the original document folder in the **WORK** key.
10. Copy the resulting *KOMPAS.ini* file to every KOMPAS workstation by locating it in the same folder as the *KOMPAS.exe* file.

    When you use the described setting, uniform document layout is ensured by the following means:

- All workstations have similar settings of newly created documents as these parameters are taken from the same **.prj* file.
- Document layouts, style of lines, texts, hatches, view and contents of template texts and other standard objects are identical, as the same system files are used.
- Line weight in paper documents and a set of print objects are identical, as the appropriate information is taken from the same **.cfg* file.

You may use **KOMPAS-documents templates** to ensure uniform document layout.
Once you have created necessary templates (or have edited those of the distribution package), locate them in a separate folder on the shareable resource. This folder can have subfolders to keep the mass of templates in order and facilitate their search.
Specify a path to the template folder in the **TEMPLATES** key of the **[Directories]** section of the *KOMPAS.ini* file.

Central document storage is ensured when you use the described setting, due to the fact that the same folder i.e. original document folder is automatically presented when documents are opened and saved on all workstations.

To facilitate document management (search, archiving, etc), it is recommended to store them in an orderly manner. You may distribute documents by folders according to their belonging to a particular project, etc.

Part II

Styles of Objects

Chapter 6.
General Information

External view of an item (a line, a point, a hatch or a text fragment) is defined by its **style**.

A KOMPAS-3D system is supplied with ready-made styles which may be used when creating and editing objects.

Custom styles can be created.

Custom styles can be stored (see also Table 6.1):

- Directly inside **a document**
- In external files — **style** libraries,
- In the named groups — **sets**.

6.1. Types of Styles and their Storage

Styles of points, lines, hatches and texts saved directly in a program code are called **system** styles. Additionally, the scope of delivery includes a line style library (*Graphic.lcs*) and a hatch style library (*Graphic.lhs*).

A user can create his own line, hatch and text styles. Custom point styles cannot be created.

When creating new styles, a user can save them in different locations. Possible locations for style storage and special features of their operation are represented in Table 6.1.

Tab. 6.1. Style storage locations

Storage location	Operational features
Document	Styles saved directly in a document file (embedded in the document styles) are transferred with it to other workstations. These styles belong to this document and are available only in it. To use styles in other documents, you must, at first, copy them from a document into a set or a library.
Library	Style libraries — the files external to documents*. If you transfer the documents, which use library styles, to other workstations, you must also transfer style libraries. Styles saved in libraries are available when different documents are created. Edition of a library style results in change of the view of all objects which use this style.
Set	Set is a named group of styles. Data on sets created by a user is saved in a file **.cfg* (see Section 5.1.3 on p. 66). By default, the styles contained in sets are available only at the workstation where they were created**. The advantage of style sets over style libraries consists in the following. The system remembers a once-used set until the end of a working session, while you have to refer to a library every time you need it. Thus, it is easier to access set styles again than to access library styles.

* The files of libraries containing line styles use extension *lcs*, hatch styles — — *lhs*, text styles — — *lts*.

** Style sets can be transferred from one workstation to another by moving a **.cfg* file. In this case, you must remember that, apart from data on sets, this file contains settings of the KOMPAS-3D system.

6.2. Operation of Styles

Line, hatch and text styles are operated in dialogs activated by the commands **Service — Style**

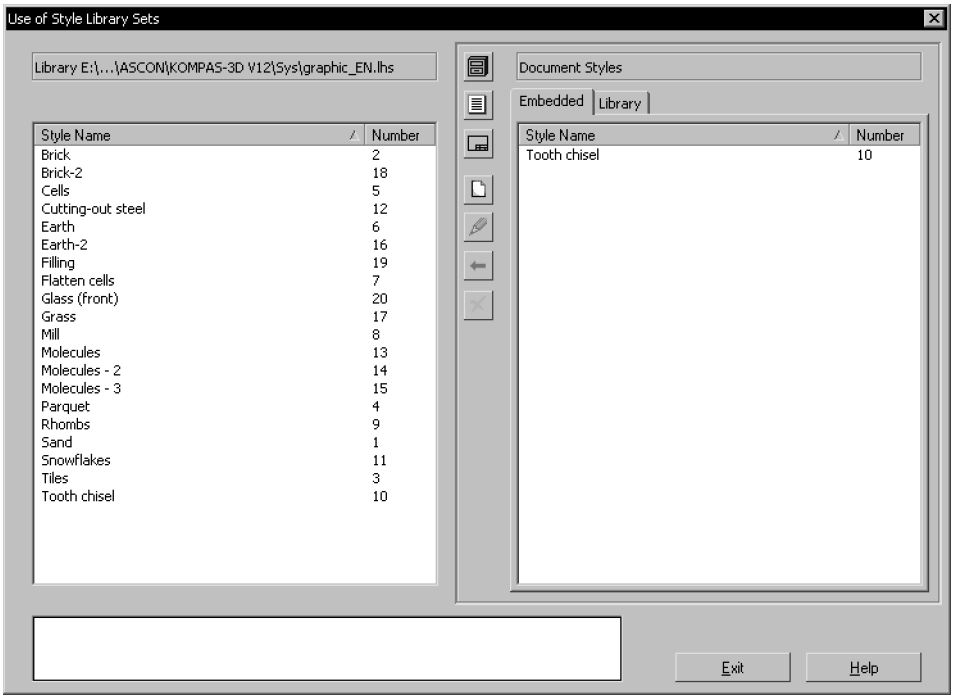


Fig. 6.1. Use of Hatch Style Libraries and Sets dialog

Libraries — Line Styles..., **Service — Style Libraries — Hatch Styles...**, and **Service — Style Libraries — Text Styles...** accordingly. For example, on the Fig. 6.1 is shown use of Hatch Style Library Sets dialog.

The dialogs have the same control elements. They are represented in Table 6.2.

Tab. 6.2. Use of Style Libraries and Sets dialog

	Element	Description
	Preview Window	The window in which a selected style set is displayed. Since two preview windows are available, two different lists of styles can be displayed in a dialog at the same time. Only one window can be active it is selected by a marquee. For example, in Fig. 6.1, the right window is active. To activate, click the mouse in the window. Styles can be sorted in the lists by names or by IDs. To alter list sorting sequence click the desired column header with the mouse. A triangle mark will be displayed in the header of the column used for sorting styles. Its position shows the sorting direction — ascending or descending. If a list of document styles or a list of set styles is selected for display, the preview window contains two pages. On the **Embedded**page a list of styles saved directly in a document or in a set is displayed (see Fig. 6.1). On the **Library** page, a list of styles saved as links to respective library styles is displayed.
	**Show Set**	Makes it possible to display a list of styles, which are saved in a set, in an active window. After clicking this button, a dialog with a list of earlier created style sets appears on the screen. You must select a name of a required set in this dialog.
	**Show Library**	Makes it possible to display a list of styles, which are saved in a library, in an active window. After clicking this button, a screen displays the dialog, in which you must specify the name for a style library file to be opened.
	**Show document**	Makes it possible to display a list of document styles in an active window. After clicking it, a list of styles, saved or used in a current document, appears in an active window. If there are no opened documents and if the current document cannot contain the objects, the styles of which are operated, this button is not available. For example, if a text document is active, the **Show Document** button will be not available in Line Style and Hatch Style Operation dialogs.
	**Create Style**	The button allowing creation of a new style. After clicking it, a Style Creation and Edition dialog appears on the screen. A newly created style will be saved in a document (set, library), a list of styles of which is displayed in an active preview window.
	**Edit Style**	The button making it possible to edit a selected style. After clicking it, a Style Creation and Edition dialog appears on the screen.

Tab. 6.2. Use of Style Libraries and Sets dialog

	Element	Description
	**Copy**	The button making it possible to exchange styles between libraries, sets and documents. After clicking it, the selected style (styles) is (are) copied to the neighboring preview window. If, in the process of copying to a document or a set, the **Embedded**page is active, the style is copied immediately to a document or a set. If, in the process of copying to a document or a set, the **Library** page is active, a link to a style to be copied is created in a document or a set.
	**Delete style**	A button making it possible to delete a selected style (selected styles). The detailed information on deleting styles is given in Section 6.2.3 on p. 76.

To finish the operation with styles, use the **Exit** button. After clicking it, all additions, deletions or changes will be automatically saved.

6.2.1. Creating Libraries and Style Sets

To create a new style library, complete the following steps.

1. Call the command **Service — Style Libraries — Line Styles...**, **Service — Style Libraries — Hatch Styles...**, or **Service — Style Libraries — Text Styles...** depending on the type of objects whose styles you want to work with.

   A Style Set and Style Library Operation dialog will appear on the screen.

2. Click button **Show Library**.
3. In the dialog that appears on the screen, select or create a folder in which a new library will be located.
4. Enter a name of a new (non-existing) library and click the **Open** button.
5. Respond **Yes** to a system prompt for creation of a new file (Fig. 6.2).

   The active preview window of a Style Operation dialog will be cleared since the newly created library is empty.

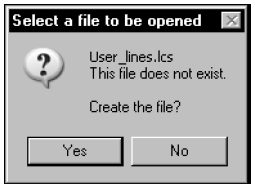


Fig. 6.2. Prompt for creation of a new library file

You can practice the technique of creating a style library by doing Exercise 1 on p. 86.

To create a new set of styles, complete the following steps.

1. Call the command **Service — Style Libraries — Line Styles...**, **Service — Style Libraries — Hatch Styles...**, or **Service — Style Libraries — Text Styles...** depending on the type of objects whose styles you want to work with.

2. Click the **Show Set** button.

3. In the appeared Style Set Operation dialog press the **New** button.
4. In the Name Set dialog, which appears on the screen, enter a set name and click the **OK** button.

   Both dialogs will be closed, while the Style Operation dialog will remain on screen. The active preview window for the Style Operation dialog will be cleared since the newly created set is empty.

   Using the **Create Style** button, you can create new styles in a library or in a set.

   Using the **Copy** button, you can copy into a library or a set already existing styles. To do this, in a neighboring window you must open a required source of styles — a library, a set or a document — for copying.

6.2.2. General Technique of Creating Styles

To create a new style, complete the following steps.

1. Call the command **Service — Style Libraries — Line Styles...**, **Service — Style Libraries — Hatch Styles...**, or **Service — Style Libraries — Text Styles...** depending on the type of objects whose styles you want to work with.

   A Style Set and Style Library Operation dialog will appear on the screen.

2. Select a new style storage location.

   Use buttons **Show Library...**, **Show Set...** or **Show Document**. You can also create a library or a set (see Section 6.2.1) for location of a new style.

3. Click the **Create Style** button.

   Note that a new style can be created in the current document or set if the **Embedded** page is active. After clicking the **Create Style** button, an Object Style Creation and Editing dialog will appear on the screen. Operation with a Line Style Creation dialog is described in Section 7.1 on p. 82, with a Hatch Style Creation dialog — in Section 8.1 on p. 92, and with a Text Style Creation dialog — in Section 9.1 on p. 106.
4. Customize properties of a new style and close the Style Creation dialog using the **OK** button.

   The name of the style created will appear in an active preview window of the Style Set and Style Library Operation dialog. You can edit a new style or copy it to another location — to a library, a set or the current document.

   A new style of the line, hatches or text in the **current document** can be created during creation or editing of an object — line, hatches or text.

   When creating or editing a line, the following actions shall be done to create a new line style:

1. Unfold the **Style** list on the Property Bar and select the **Another Style** string.

   The dialog to select the line style will be displayed on the screen (Fig. 6.3).

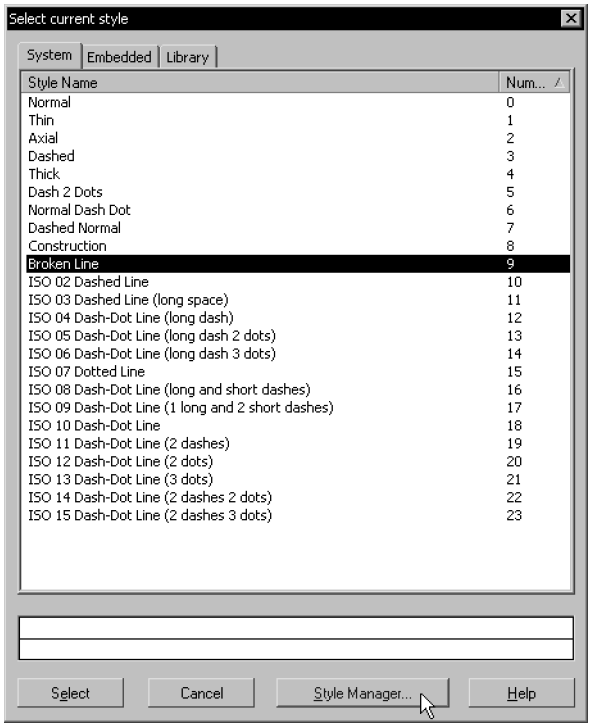


Fig. 6.3. elect Line Style dialog

2. Press the **Style Manager...** button in the dialog.

   The Line Style Manager dialog will appear on the screen (Fig. 6.9).

3. Click the **New Style** button in the Line Style Manager.

   The dialog for creating and editing named groups will appear. Work with these options is described in Section 7.1 on p. 82.

4. Customize properties of a new style and close the Style Creation dialog using the **OK** button.
5. The name of the created style will appear in the Line Style Manager list. Close the Line Style Manager by clicking .

   The name of the created style will appear in the style selection dialog on the **Embedded** page. You can set this style for the current style by clicking the **Select** button.

   When creating or editing the hatches (text), the following actions shall be done to create a new hatches (text) style:

1. Unfold the **Style** list on the Property Bar and select the **Another Style** string.

   The style selection dialog will appear. An example of the hatches style selection dialog is shown in Fig. 6.4; the text style selection dialog is analogous to the shown one. By default, a list of document styles is displayed in a Style Selection dialog (which is indicated by a line in the upper part of the dialog — see Fig. 6.4).

2. If this is not the case, click the **Document** button in the **Show** group.
3. Activate the **Embedded** page and click the **New...** button.

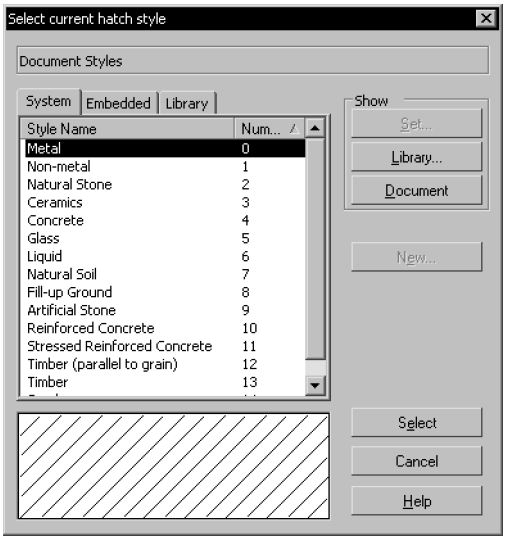


Fig. 6.4. Select Hatch Style dialog

The dialog for creating and editing a style object will appear. Work with the hatches style creation dialog is described in Section 8.1 on p. 92, and work with the text style creation dialog — in Section 9.1 on p. 106.

4. Customize properties of a new style and close the Style Creation dialog using the **OK** button.

   The name of the created style will appear in a list on the **Embedded** page. You can set this style for a current object by clicking the **Select** button.

   A style created when creating or editing an object is no different from a style created in the dialog of working with style sets and libraries.

6.2.3. Deleting Separate Styles, Style Sets and Style Libraries

To delete the styles which have become unnecessary, perform the following operations.

1. Call the command **Service — Style Libraries — Line Styles...**, **Service — Style Libraries — Hatch Styles...**, or **Service — Style Libraries — Text Styles...** depending on the type of objects whose styles you want to work with.

   A Style Set and Style Library Operation dialog will appear on the screen.

2. In the dialog, specify the style library that stores the style to be deleted.

   Use buttons **Show Library...**, **Show Set...** or **Show Document**.

3. Select the styles to be deleted and click the **Delete Style** button.

   A Style Delete dialog will appear on the screen (Fig. 6.5). This dialog contains the name of the style to be deleted and control buttons for deleting. The functions of the buttons are represented in Table 6.3.

Fig. 6.5. Style Deletion dialog

Tab. 6.3. Control buttons for deleting object styles

Button	Purpose
Delete	Deleting the style whose name is displayed in the dialog. After clicking this button, you proceed to the next style (if multiple styles were selected for the deletion).
Delete All *	Deleting all selected objects.
Skip *	Undoing the style deletion, whose name is displayed in the dialog. After clicking this button, you proceed to the next style.
Cancel	Interrupting the style deletion operation.

* The button is available if several styles are selected for deletion.

Line styles embedded in the document can be deleted in the Line Style Manager (see Fig. 6.9) provided they are not used.

Be careful when deleting styles, as their recovery is impossible.

To delete a style set which has become unnecessary, perform the following operations.

1. Call the command **Service — Style Libraries — Line Styles...**, **Service — Style Libraries — Hatch Styles...**, or **Service — Style Libraries — Text Styles...** depending on the type of objects whose styles you want to work with.

   A Style Set and Style Library Operation dialog will appear on the screen.
2. Click the **Show Set...** button.
3. In the Style Set Operation dialog, which appears on the screen, select a set to be deleted and click the **Delete** button.
4. Respond **Yes** to the system prompt for deletion of a set.
5. Click the **Exit** button of a Style Set Operation dialog.

Deletion of the current set (a list of styles of which is at the moment displayed in the Style Set and Style Library Operation dialog) is impossible.

Be careful when deleting sets: after logging off the Set Operation dialog, cancellation of the operation is impossible. You can recover a set only immediately after a positive response to the prompt for deletion. To do it, click the **Undo** button in the Style Set Operation dialog.

To delete a style library, you must delete its file from the disk.

6.2.4. Number of a Style

Each style has an index number which is assigned to it when this style is created.

The index numbers of styles saved in documents and sets can coincide, as these styles are used directly (without making any links).

The index numbers of styles saved in a library must differ. This is connected with the fact that when a library style is assigned to an object in a document that contains this object, a link to this style appears. The link includes the following data: a full library name and an index number of a style from it.

If you try to insert a style into a library (by creating or copying) and the index number of this style is the same as that of one of the styles already existing in this library, a Warning dialog appears on the screen (Fig. 6.6).

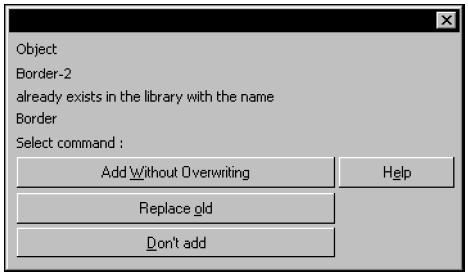


Fig. 6.6. Warning dialog about the presence of a style in a library

It contains the names of styles having the same index numbers, and control buttons. The functions of the buttons are represented in Table 6.4.

Tab. 6.4. Buttons controlling the insertion of an object into a library

Button	Purpose
Add while saving the old one	Inserting an object into a library without deleting the existing object from it. The first of the available ("vacant") numbers will be assigned to a new object.
Add in place of the old one	Inserting an object into a library with replacement of the existing object. The existing object will be deleted — thus, its index number will become available for use. A new object will be inserted into a library without any change of its index number.
Don't Add	Cancel insertion of an object into a library. To cancel insertion of a newly created object into a library means the loss of all settings made. Since in this case an object to be inserted is not used in any document yet, it should be suitably added (to the library), saving the existing object.

Should a library have a style, the index number and the name of which is the same as those of the style to be added, a prompt to confirm rewriting the style — replacement of the old style with a new one — will appear on the screen. You can confirm or reject the overwrite.

If there is a rather high probability of style interchange between several libraries, you must provide different index numbers to all styles in these libraries. It will help to prevent the conflict situations described above.

6.2.5. Storing the Data on Object Styles in a Document

Thus, if an item (a line, a hatch or a text) uses a style different from the system's, two options for storing data on this style in a document are available.

The first option — storing the style itself inside a document (embedded style).

The second option — storing a link to a library that contains the style used (library style).

All links available in a current document, including the links to style libraries, can be viewed on the **External Links** page of the Document Data dialog. Use the **File — Document summary...** command to activate this dialog.

Both sets and documents can contain either styles (their list is displayed on the **Embedded** page — see Fig. 6.1 on p. 71), or links to library styles (their list is displayed on the **Library** page).

In case a style that is directly contained in a set is assigned for an object, the used style is copied into a document, i.e., the first option of storing data on a style is employed.

In case a style that is contained in a set as a link, is assigned for an object, a link to a selected style is also made in a document, i.e., the second option of saving data on a style is employed.

Editing the style saved in a document results in changes in this document only: the appearance of all objects that use the edited style changes.

Editing the style saved in a library results in changes in all documents containing the objects that use the edited style.

If the document is opened and the library, the hatches or text style of which is used in this document, is not found (is deleted, moved or renamed), then a Warning dialog appears on the screen (Fig. 6.7).

Fig. 6.7. Warning dialog notifying of the absence of a hatches style library

The dialog contains the full name of the library not found and control buttons. The functions of the buttons are represented in Table 6.5.

Tab. 6.5. The buttons of a Warning dialog notifying of the absence of a style library

Button	Purpose
Find File	Selecting the library file from which a style must be taken.
Delete style	Deleting a link to a library and assigning a system style to objects.
Cancel Reading	Cancellation of the command to open a document.

If the library to which a document refers is found but it lacks the hatches or text style with a required index number, then a style is replaced according to the following rule:

- System style *Metal* is used in stead of the hatch style not found.
- Instead of the text style not found — a corresponding system style (*Text on Drawing*, *Dimension Texts*, etc.).

If at the moment of file opening a library, from which the line style is used for this document, is not found, or the style is not found in the library, then a message shown on Fig. 6.8 will appear on the screen.

Fig. 6.8. Warning dialog notifying of the absence of libraries or line styles.

Drawing of a line using a non found library style does not change.

6.3. Peculiarity of work with line styles

Work with line styles (in contrast to the work with hatches and text styles) is characterized with a possibility of generation of a list of styles of the current and new documents.

The list setting up is carried out in the Line Style Manager (Fig. 6.9). When working with the current document, the Manager also allows to carry out main actions with the line styles — creation, editing and deletion.

The document style list is displayed in the left part of the Line Style Manager. The buttons located above the list allow to do the following:

- Create new line styles in a document

- Edit the embedded styles

- Delete the embedded styles (provided that they are not used).

A library (or a set) can be opened in the right part of the Line Style Manager (after clicking the **Add Styles** button) for inclusion of styles to the list of document styles. Two methods of style addition are available:

- Creation of a link to a library style

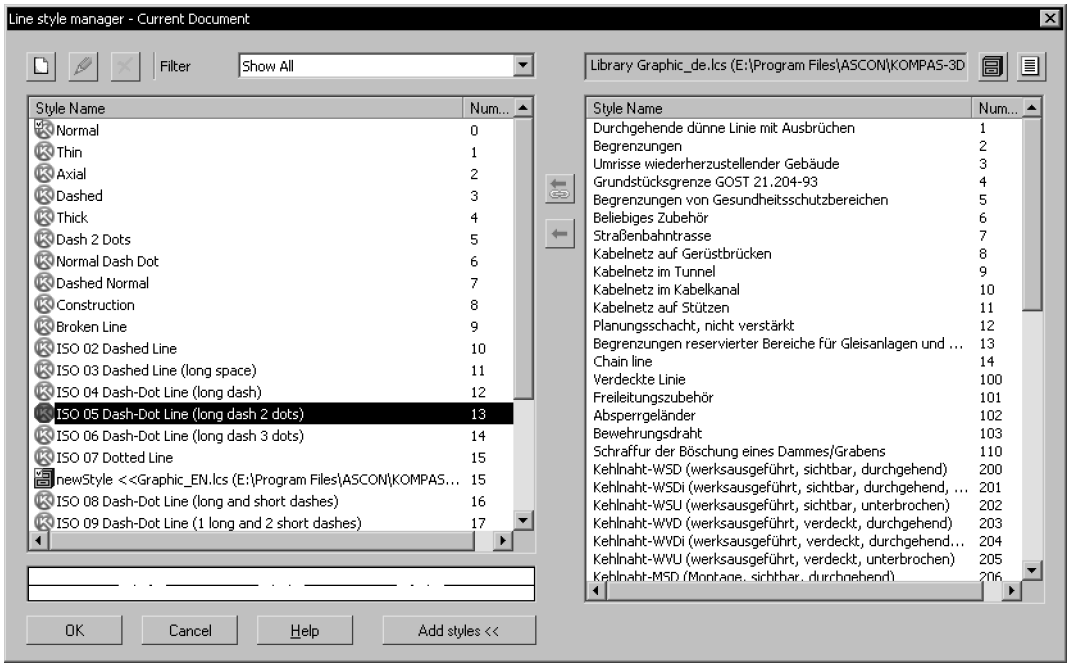


Fig. 6.9. Line Style Manager during the line style list setting up for the current document

- Embedding of a style from a library or a set to the document.

The Line Style Manager can be called by two ways:

- By clicking the **Modify List ...** button in the line style setting up dialog for the current or new graphics documents
- By clicking of the **Style Manager...** button in the line style selection dialog (see Fig. 6.3).

Chapter 7.
Custom Line Style

To create a line style, perform the following operations.

1. Call command **Service — Style Libraries — Line Styles...**

   A Style Set and Style Library Operation dialog will appear on the screen.

2. Select a new style storage location.

   Use buttons **Show Library...**, **Show Set...** or **Show Document**. Style storage locations are described in Section 6.1 on p. 70.

3. Click the **Create Style** button.

   The dialog for creating and editing named groups will appear.

4. Customize the parameters of a new style (see Section 7.1) and close the dialog.

   The name of the style created will appear in an active preview window of the Style Set and Style Library Operation dialog.

After reviewing the material set forth in Section 7.1, it is recommended to do the exercises of Section 7.2. It will allow you to practice the described technique of creating line styles.

7.1. Customizing a Line Style

Customizing the parameters of a line style is performed in a Style Creation and Edition dialog (Fig. 7.1). The control elements of this dialog are represented in Table 7.1.

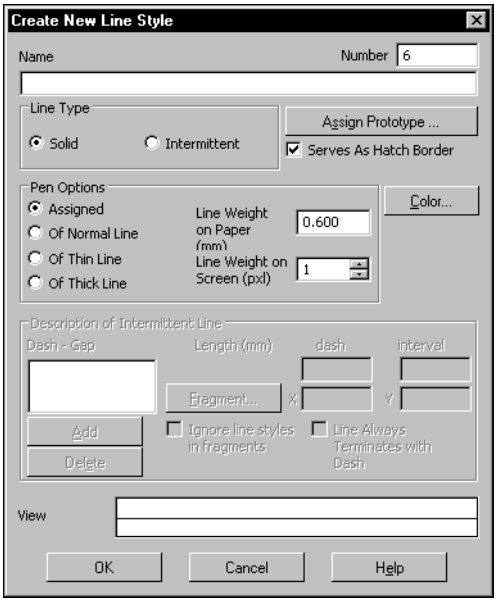


Fig. 7.1. Dialog to Create or Edit thicknessLine Style

Tab. 7.1. Dialog to Create or Edit Line Style

Element	Description
Name	A field for entering (editing) a style name. It is recommended that informative style names be given which fairly represent the function of such styles. In the future this will simplify the search for a style in a list.
Number	A field for entering (editing) a style number. The rules of style numbering are set forth in Section 6.2.4 on p. 78.
Curve Type	A group of options making it possible to select a line type: **Solid** or **Intermittent**.
Assign Prototype	A button making it possible to select a current style as a template (a prototype) of a newly created style. Assignment of a prototype is useful if a new style is a modification of that already existing style. After clicking this button, a dialog, in which you must select a prototype style, will appear on the screen. Thereafter, options are activated and values corresponding to the properties of a prototype style appear in the Line Style Creation and Edition dialog.
There appears a border As Hatch Border	Activation of this option means that the lines of this style will be accounted for by the system in the process of auto determination of hatch borders.
Pen Settings	A group of elements (see Table 7.2), making it possible to set parameters of drawing a line on the screen and printing parameters.
Color	A button allowing selection of a line color.
Description of Intermittent Curve	A group of elements (see Table 7.3), which allows one to set settings of a dashed line. This group is available if in the **Line Type** group, the **Dashed** option is activated.
Preview	This field shows the appearance of the line style to let you immediately evaluate the changes you made.

Tab. 7.2. Elements of the group **Pen Options**

Element	Description
Assigned	An option making it possible to set arbitrary pen options. After its activation, the fields for entering width become accessible.

Tab. 7.2. Elements of the group **Pen Options**

Element	Description
Default/ Thin/ Thick Line	If the parameters of drawing a line of a style to be created must be the same as those set for some system line (normal, thin or thick), activate the respective option. After activation of one of these options, the fields for entering width become unavailable. In changing the properties of a normal, thin or thick system line* the appearance of lines of a custom style, which was customized with a respective option, activate changes, too.
Thickness On Paper	Sets the line thickness for printing on paper (in millimeters).
Thickness On Screen	Defines the line thickness for display (in pixels).

* The properties of system lines are customized in a dialog activated by the command **Service — Options... — System — Graphic Editor — System Lines**.

Tab. 7.3. Elements of a group **Description of Dashed Curve**

Element	Description
Dash–Gap	A list of specified combinations of dash lengths and gap lengths. The line can be composed of a sequence of such combinations. To edit the dimensions of a dash and a gap in a combination, select this combination in a list and change the values in the fields **Dash Length** and **Gap Length**.
Dash Length, Gap length	Dimensions of dashes and gaps in millimeters.
Add	A button making it possible to create a new dash-and-gap combination. Dimensions of a dash and a gap in a new combination are the same as those in the combination selected before a new combination was created. A new combination is added to the end of a list.
Delete	A button making it possible to delete a dash-and-gap combination selected in a list.
Fragment	A button making it possible to add a KOMPAS-3D arbitrary fragment to a dash-and-gap combination. For more information, see Section 7.1.1.
X,Y	The fields for entering the values of the fragment origin offsets relating to the dash beginning.

Tab. 7.3. Elements of a group **Description of Dashed Curve**

Element	Description
Ignore the Styles of Fragment Lines	If this option is enabled, then all lines of all fragments use width and color specified for a line style to be customized (using the button **Color** and the group **Pen Options**) If this option is disabled, the width and the color of fragment lines depend on line styles used in them, as follows: ▼ Custom styles of a fragment line are replaced with a system line style *Normal* with current settings, i.e., screen and print color and width settings set in the system at the moment of including the fragment into a line style. ▼ System styles of a fragment line are saved in a line style with current properties (if system lines had other properties when a fragment was created, these properties are replaced with the current ones)*. Intermittent lines, such as *Dashed*, *Axial* etc., are replaced with solid lines.
Curve Always Terminates with Dash	Activation of this option means that a line will start and end with a dash (not with a gap). The fitting is performed by proportional change of dash lengths. The status of this option is taken into account only if the dashes have zero length.

* Properties of fragment lines are saved in a line style. They cannot be changed neither during, nor after style creation.

7.1.1. Line Style with Fragments

KOMPAS-3D makes it possible to obtain not only solid and broken lines, but also the lines which include fragments — images, recurrent through all the line (Fig. 7.2).

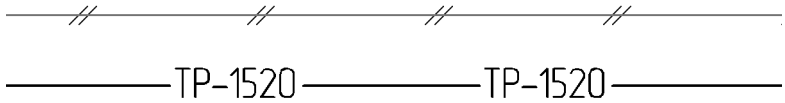


Fig. 7.2. Examples of lines containing fragments

The fragments are selected when a line style is customized — in the **Description of Dashed Curve** group of the Line Style Creation and Edition dialog (see Fig. 7.1 on p. 82). The fragments can be included in an dashed curve only.

To imitate a solid line, set a zero gap length.

To add a fragment in a dash-and-gap combination, select this combination in a list and click the **Fragment...** button.

A standard File Selection dialog will appear on the screen.In this dialog you must select a fragment **.frw* to be included in a line style (naturally, it must be prepared beforehand).

Then you must select the image location relative to a dash beginning. To do it, in the **X** field enter the value of the offset in dash direction (along a line), and in the **Y** field — the value of the offset which is perpendicular to the dash direction (perpendicular to a line).

The fragments are included in a line style in accordance with the following rules.

- One fragment can be included in one dash-and-gap combination.
- The origin of a fragment is offset by the specified values X and Y relative to a dash beginning in a dash-and-gap combination, and a fragment is not rotated and scaled.
- The origin of a fragment must fall within an interval dash length + gap length, i.e., the offset of a fragment along must be less than a total length of a dash-and-gap combination.
- The fragment included in a line style loses its connection with its source file.

  To delete a fragment from a style, you must delete a dash-and-gap combination containing this fragment.
- Only curves, fills and texts having a True Type font are sent from a fragment to the contents of a "picture" in a line style. In this case letters transform into fills.
- Inherent colors of fills and texts contained in fragments are ignored. The color selected for dashes of the customized line style is used for them.
- The width and color of lines of a "picture", depending on the **Ignore Fragment Line Styles** option status (see Table 7.3), may be the same as those of dashes in a customized line style, and may depend on the line styles used in fragments of line styles.

  The lines, the style of which includes fragments, are drawn in a document according to the following rules.
- The fragments, the outline dimensions of which transcend the curve limits, are not drawn.
- The fragments are arranged is such a way that the X axis of each of them would be directed tangential to a curve in a dash beginning point.
- Hatches, fills and equidistant lines of the contours formed by the lines which include fragments, are constructed ignoring the fragments.

7.2. Practice of Creating Line Styles

This Section contains exercises enabling to master the technique of creating line styles (including the styles containing fragments).

Exercise 1. Creating a line style library

Задание Create a file of a line style library user_lines.lcs.

1. Invoke the **Service — Style Libraries — Line Styles...** command. A Style Set and Style Library Operation dialog will appear on the screen.
2. Click the right preview window. It will become active : a marquee will appear around it.

3. Click button **Show Library**.
4. The Open File dialog will appear on the screen. By default, the current folder is a folder *\Sys*, containing a system line style library *Graphic.lcs*. Select another folder, if necessary.
5. Enter the name of a new library— **user_lines** in the *File Name* field.

6. Click the **Open** button. A dialog with a prompt for creating a file *user_lines.lcs* will appear on the screen.
7. Click the **Yes** button.

   A new style library — *user_lines.lcs* will be created in the current folder.

   The dialog with a prompt and the File Opening dialog will close, and a screen will display a Style Set and Style Library Operation dialog. The header of an active (right) window will contain a word “Library” and a full path to the Library created. The active preview window is empty, as it contains no styles yet.

   Without closing the Style Set and Style Library Operation dialog, proceed to performing the next exercise.

Exercise 2. Creating a line style without fragments

Задание Create a line style shown in Fig. 7.3. Dimensions of dashes and gaps are shown in Fig. 7.4. Line width – 1.2 mm, color – dark blue.

Fig. 7.3. A sample of a line style

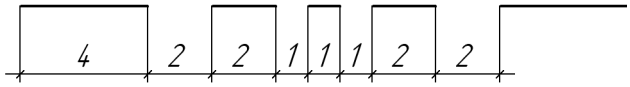


Fig. 7.4. Dimensions of dashes and gaps

1. Click the **Create Style** button in the Style Set and Style Library Operation dialog.

   A Line Style Creation dialog will appear on the screen.
2. Enter value *100* into field **Number**.
3. Enter the name of a style to be created— **Dashed Special**— in the *Name* field.
4. In the **Curve Type** group select the **Dashed** option.
5. Activate the **Serves as Hatch Border** option, so that the line of a style to be created could border the hatch.
6. Select the **Assignable**option in the **Pen options** group.
7. Enter the value **1.2** in the *Width on Paper* field, and the value **2** in the *Width on Screen* field.
8. Click the **Color** button and select a dark blue color for a line.

   The style created consists of four dash-and-gap combinations (Fig. 7.5).

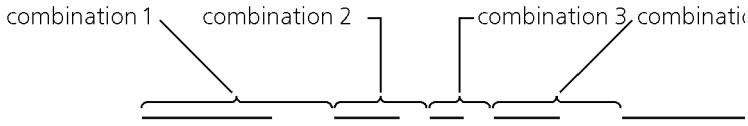


Fig. 7.5. Dash-and-gap combinations in a Dashed special line style.

   List **Dash–Gap** in the **Description of Dashed Curve** group while it contains one dash-and-gap combination. By default, the dash length is equal to the gap length and equal to 1 mm.
9. Change these values for the following ones: dash length — *4*, gap length — *2*.

The changes made will be sent to a **Dash-Gap** list of combinations. The **Preview** field will display a line consisting of 4-mm dashes separated by 2-mm gaps.

10. Click the **Add** button.

    A new combination duplicating the existing one will appear in a **Dash-Gap** list.

11. Make a dash length to be equal to *2*, and that of a gap — to *1*.

    This change will also be fixed in a list of combinations and in the **Preview** field.

12. Add the third and the fourth combinations in accordance with Fig. 7.5.

13. Activate the **Line Always Terminates with Dash** option, so that the line of a style under creation will begin and end with dashes, not with gaps.

    Customizing of a new style is completed (Fig. 7.6).

    Click the **OK** button in a Style Creation dialog.

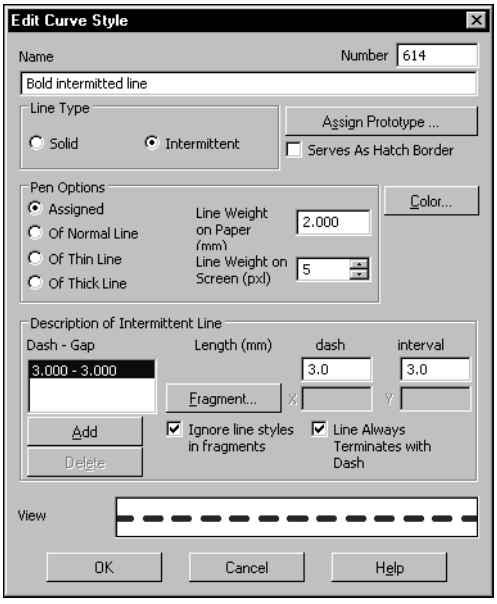


Fig. 7.6. Dashed Special Line style settings

The Style Creation dialog will be closed. A Style Set and Style Library Operation dialog will remain on the screen. The name of the first style of the current library — the style created by you— *Dashed Special* — will appear in the right preview window.

14. Use of Style Library Sets dialog.

Exercise 3. Check of a line style created.

Задание Check the compliance of the **Dashed Special** line style created by you with the requirements set forth in the task for the Exercise 2.

1. Create a KOMPAS-3D graphic document.
2. Apply the **Tools — Geometry — Lines — Line** command.
3. Click in the **Style** field on the property bar.
4. Select the **Another Style** line in the displayed list.

5. In the Current Style Selection dialog, which appears on the screen, click the **Library...** button.
6. Select the library created by you — *user_lines.lcs* — in the current File Opening dialog.
7. On the **Library** page of the Current Style Selection dialog select the library style name — *Dashed Special* — and click the **Select** button.

   The dialog will close and the selected style will become the current style: It will be displayed in the **Style** field.
8. Create a line, 50 mm long.

   The resulting line must have a dark blue color and a screen width of 2 pixels.

Since the **Line Always Terminates with Dash** option was activated when a line style was customized, the fitting of dashes is performed when a line is drawn — such proportional change of their lengths which is made in order to meet the above-mentioned condition. Due to the fact that a line length by far exceeds dash lengths, their deviations are not visible.
In case of a small line length, the alterations of dash lengths may become visible.
In case the dash length is less than the aggregate of lengths of all dash-and-gap combinations specified in the process of customizing a line style, a solid line is drawn.
If the **Line Always Terminates with Dash** option is deactivated, the fitting of dashes is not performed.

9. To check whether the width set for printing (1.2 mm) is met, print the document.
10. To check whether a created line is a hatch border, construct a circle such that the created line would be its chord.
11. Create a hatch, indicating its base point inside the circle. The hatch must appear only in the circle part that is bounded by the line.

Exercise 4. Creating a line style with fragments

Create a line style **"Oil-proof Capping"** (Fig. 7.7,7.8). The width and color of a line correspond to a normal line.

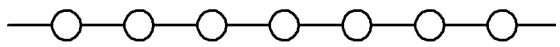


Fig. 7.7. A sample of a line style

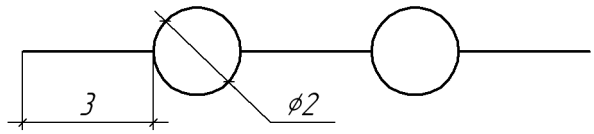


Fig. 7.8. Dimensions of elements

1. Create a fragment, which will be included in a line style.
   1.1. Create a new fragment.
   1.2. In this fragment create a circle with the radius of 1 mm with its center point at the coordinate origin. A circle can have any line style.
   1.3. Save the fragment as *line_style.frw*.
2. Invoke the **Service — Style Libraries — Line Styles...** command.

3. Open the *user_lines.lcs* library, created when you did the Exercise 1.

3.1. Click button **Show Library**.

3.2. Select the *user_lines.lcs* file in the File Opening dialog which appears on the screen.

A full library name shall appear in the header of the active preview window; and in the window itself — a list of styles contained in this library.

4. Create a new style.

4.1. Click the **Create Style** button.

A Line Style Creation dialog will appear on the screen.

4.2. Enter value *101* into field **Number**.

4.3. Enter the name of a style to be created— **Oil-proof Capping** — in the *Name* field.

4.4. In the **Curve Type** group select the **Dashed** option.

4.5. Activate the **Serves As Hatch Border** option.

4.6. Select an **Normal Line** option in the **Pen Options** group.

4.7. **Dash-Gap** list in the **Description of Intermittent Line** group contains one dash-and-gap combination. By default, the dash length is equal to the gap length and equal to 1 mm. Change these values for the following ones: dash length — *3*, gap length — *2*.

If before pressing the **Create Style** button, a *Dashed Special* style was selected in the dialog, this style is used by default as a prototype. Hence, the **Dash-Gap** list will contain four combinations. Delete three of them using the **Delete** button. Edit the remaining combination by changing dash-and-gap lengths.

The changes made will be sent to a **Dash-Gap** list of combinations. A line consisting of 3-mm dashes separated by 2-mm gaps will be displayed in the **Preview** field.

4.8. Activate the **Line Always Terminates with Dash** option so that the line of a style created will begin and end with dashes.

4.9. Click the **Fragment...** button. The Open File dialog will appear on the screen.

4.10. In this dialog, select the file created when p.1 was performed and click the **Open** button.

The selected fragment will be added to the current dash-and-gap combination (selected in a list). It will be displayed in the **Preview** field: an image of a selected fragment — a circle — appears in it.

Since the values in the **X** and **Y** fields — fragment origin offsets relative to a dash beginning — are by default equal to zero, the dashes overlap the circles.

To ensure the compliance of the style to be created with a sample, you must locate a circle center point in the middle of a gap (Fig. 7.9).

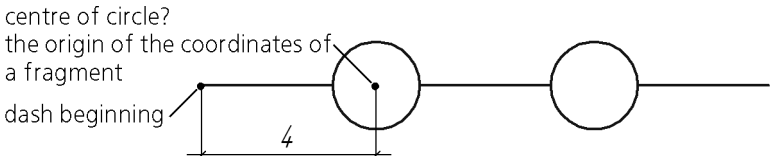


Fig. 7.9. Location of a circle in relation to a dash beginning.

4.11. Enter value *4* in the **X** field.

The circles in the **Preview** field will be moved by 4 mm to the right, thereby occupying the required place.

Vertical offset is not required, therefore value **0** in the *Y* field should remain unchanged.

4.12. Customizing of a new style is completed (Fig. 7.10). Click the **OK** button in the Line Style Creation dialog.

The Style Creation dialog will close and the name of the second style — *Oil-proof Capping* will appear in the active preview window.

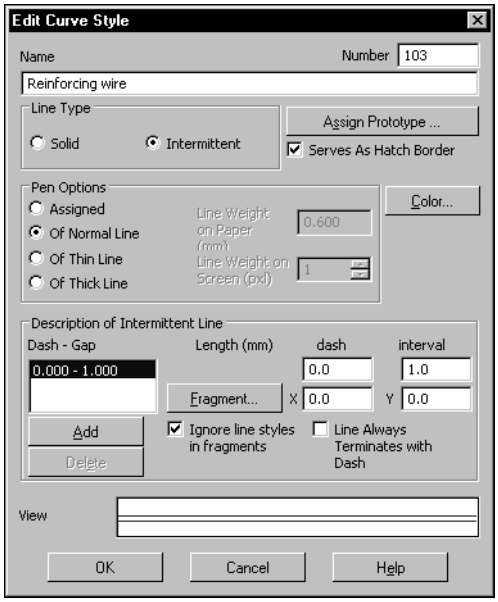


Fig. 7.10. Settings of line style Oil-proof Capping

5. Close the Style Set and Style Library Operation dialog by clicking the **Exit** button.
6. Make sure that the style is created correctly by performing the operations similar to those described in the Exercise 3.

Exercise 5. Creating a line style with fragments Test

Задание Create a line style **"Oil-proof Capping"** (Fig. 7.11,7.12). The width and color of a line correspond to a normal line.

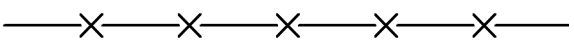


Fig. 7.11. A sample of a line style

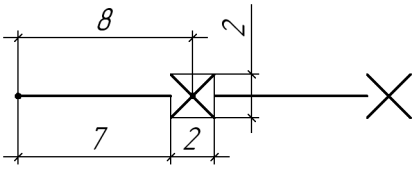


Fig. 7.12. Dimensions of elements

Chapter 8.
Custom Hatch Style

To create a hatch style, perform the following operations.

1. Apply the command **Service — Style Libraries — Hatch Styles...**.

   A Style Set and Style Library Operation dialog will appear on the screen.

2. Select a new style storage location.

   Use buttons **Show Library...**, **Show Set...** or **Show Document**. Style storage locations are described in Section 6.1 on p. 70.

3. Click the **Create Style** button.

   The dialog for creating and editing named groups will appear on the screen.

4. Customize the parameters of a new style (see Section 8.1) and close the dialog.

   The name of the style created will appear in an active preview window of the Style Set and Style Library Operation dialog.

After reviewing the material set forth in Section 8.1, it is recommended to do the exercises of Section 8.2. This will allow you to practice the described technique of creating hatch styles.

8.1. Customizing a Hatch Style

Customizing a hatch style — description of **groups of recurrent lines** component. In this Section and in Section 8.2 the word “line group” shall mean a group of hatch lines.

A plain hatch (for example, hatch of a system style *Metal*) consists of one group, and a composite hatch (for example, *Non-metal*) consists of several groups overlapping each other.

A hatch style is customized in a Style Creation and Edition dialog (Fig. 8.1). The control elements of this dialog are represented in Table 8.1.

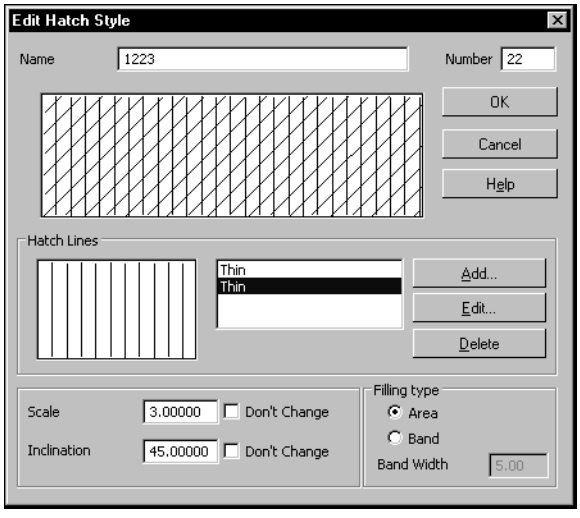


Fig. 8.1. Dialog to Create or Edit Hatch Style

Tab. 8.1. Dialog to Create or Edit Hatch Style

Element	Description
Name	A field for entering (editing) a style name. It is recommended to give informative style names, which accurately represent the function of such styles. In the future this will simplify the search for a style in a list.
Number	A field for entering (editing) a style number. The rules of style numbering are set forth in Section 6.2.4 on p. 78.
Preview Window	Contains the image of a current hatch view. Any change of the properties will be immediately displayed in this window.
Lines As Hatch Border	A group of elements for operation with lines forming a hatch. This group contains a list of line groups, a preview window for the selected group, and the control buttons for the groups. The **Add...** button makes it possible to include a new group of lines into a style. After pressing it, a Hatch Line Properties Customizing dialog appears on the screen (see Table 8.3). A new group is always added at the end of the list. The **Edit...** button makes it possible to change the properties of the group selected in a list. After pressing it, a Hatch Line Properties Customizing dialog likewise appears on the screen. The **Delete** button makes it possible to exclude the group, selected in a list, from a hatch.
Scale	This field serves for entering the image scale*. If it is required to make it possible to change the hatch scale when a hatch of a given style is created, deactivate the **Do not change**** option.
Inclination	The field for the slope of a hatch image. If it is required to make it possible to change the hatch slope when a hatch of a given style is created, deactivate the **Do not change**option**.
Filling type	**Area** option makes it possible to set a solid hatch fill within selected borders. **Band** option makes it possible to set a hatch in the form of a band along a border. The **Band Width** field makes it possible to set a width (in millimeters) of a band, which will be filled with a hatch.

* The following values are to be multiplied by the factor set in this field: **X**, **Y**, **deltaX**, **deltaY** (see Table 8.2 on p. 94) and also dash-and-gap lengths in broken lines. The line width remains unchanged.

** In this case, when a hatch is created in a graphic document, a corresponding field appears on the properties bar.Inclination

8.1.1. Setting Hatch Line Properties

When a hatch style is created, the relative position of groups is defined by the values of their offset and rotation relative to the origin of some arbitrarily selected Cartesian coordinate system (Fig. 8.2).

The view of a hatch itself does not depend on the location of a coordinate system when a hatch style is created. Therefore, the coordinate system location should be selected on the basis of operational convenience. You may practice selecting the location of a coordinate system, performing Exercises 7 and 9 from Section 8.2.

When a hatch is created in a graphic document, the hatch is located in such a manner that the origin of its coordinate system would coincide with the origin of coordinate system of a fragment or a drawing view. The rotation angle of a hatch coordinate system is defined by a value specified in the **Slope** field of a Hatch Creation and Edition dialog (see Table 8.1).

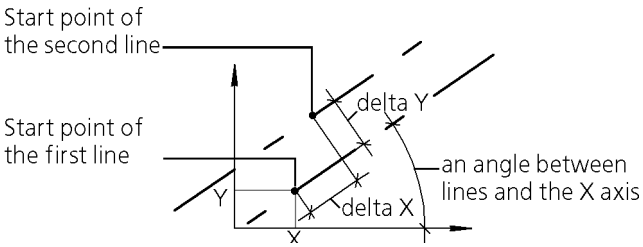


Fig. 8.2. Properties of a hatch line group

Parameters characterizing the location of a group of lines in a hatch coordinate system are represented in Table 8.2.

Tab. 8.2. Properties of a hatch line group

Parameter	Description
Angle	The lines group slope angle to the X axis of the hatch coordinate system.
X	Abscissa of a start point of the first line *.
Y	The ordinate of a start point of the first line.
deltaX	The subsequent line move relative to a preceding line (for groups of dashed lines).
deltaY	Spacing of lines (a distance between neighboring lines).

* The start point of a solid line is its arbitrary point. The start point of a dashed line is the beginning of a dash in the first dash-and-gap combination (see Table 7.3 on p. 84).

Selection of lines forming a group and setting the location of a group in a hatch coordinate system is performed in the Line Properties Customizing dialog (Fig. 8.3).

The control elements of this dialog are described in Table 8.3.

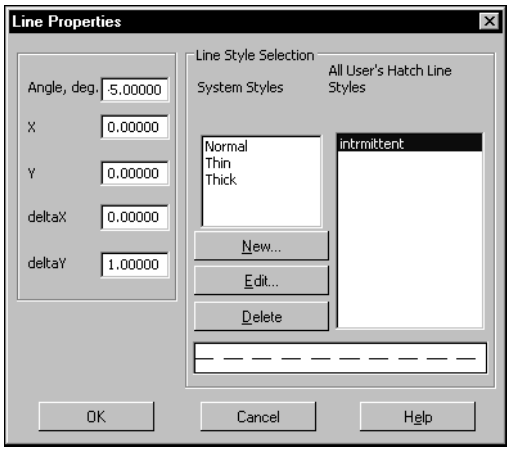


Fig. 8.3. Hatch Line Settings dialog

Tab. 8.3. Hatch Line Settings dialog

Element	Description
Selection Line Style	A group of elements (see Table 8.4 on p. 95), allowing selection of a style of lines forming a group to be customized.
Angle, X, Y, deltaX, deltaY	The fields for entering the values of parameters specifying the location of a group of lines in a hatch coordinate system (see Fig. 8.2). The line values are set in millimeters.

Tab. 8.4. Elements of the group **Line Style Selection**

Element	Description
System Lines	A list of system lines which can form a hatch line group to be customized.
All User's of line style current Hatch	A list of custom lines which can form a hatch line group to be customized.
New...	The button making it possible to create a new custom line style. The button is accessible if the active element of a dialog is a list of custom lines. Activation is performed by a click in this list. After clicking the **New...** button the Line Style Creation and Edition dialog will appear on the screen (see Table 7.1 on p. 83)*.

Tab. 8.4. Elements of the group **Line Style Selection**

Element	Description
Edit...	A button which allows editing of a custom line style selected in a list. After clicking this button, the Line Style Creation and Edition dialog appears on the screen.
Delete	A button making it possible to delete a custom line style selected in a list. When deleting a user style, all lines of this hatch for which the style was used will be drawn by the system *Normal* line style.
Preview Window	Contains an image of a line selected in a list.

* When a line style for a hatch is created, the addition of fragments into dash-and-gap combinations is impossible, and therefore the corresponding elements are not available in the Line Style Creation dialog.

8.2. Practice in Creation of Hatch Styles

Hatches which meet GOST requirements are supplied as part of KOMPAS-3D system. You can create hatch styles meeting other standards — ISO, DIN and others.

This section contains exercises for mastering the technique of hatch style creation on the basis of the hatches samples, the use of which is required by German standard DIN 201.

Exercise 6. Creation of a hatch style library. Independent work

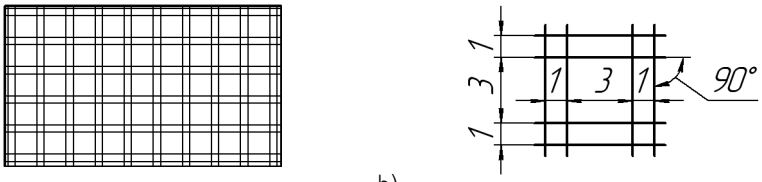
Задание Create a hatch style library user_hatches.lhs.

1. Invoke the **Service — Style Libraries — Hatch Styles...** command.
2. Create a hatch style library *user_hatches.lhs* in a similar way as you created a line style library in Exercise 1.

   Without closing the Hatch Style Set and Hatch Style Library Operation dialog, proceed to doing the next exercise.

Exercise 7. Creating a Porcelain hatch style

Задание Create a **Porcelain** hatch style (Fig. 8.4). Hatch line style – Thin.



a) b)

Fig. 8.4. Hatch style Porcelain:
a) hatch sample, b) location of hatch elements

This hatch consists of four groups of solid lines (Fig. 8.5).

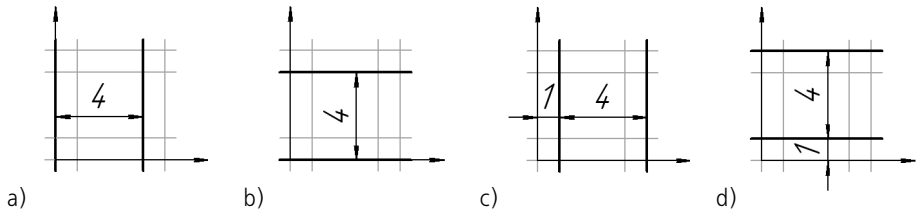


Fig. 8.5. Groups of lines forming a Porcelain hatch:
a) group 1, b) group 2, c) group 3, d) group 4

The location of a coordinate system is selected in such a way that it will be convenient to define the location of groups. The parameters characterizing this location are represented in Table 8.5.

Tab. 8.5. The parameters characterizing the location of groups of lines in a hatch coordinate system

Group	**Angle**	**X**	**Y**	**deltaY**
Group 1	90°	0	0	4
Group 2	0°	0	0	4
Group 3	90°	1	0	4
Group 4	0°	0	1	4

1. Click the **Create Style** button in a Hatch Style Set and Hatch Style Library Operation dialog.

Make sure that the *user_hatches.lhs* library window will be active. Otherwise, a new style will be added to a library (a set or a document) opened in a neighboring window.

A Hatch Style Creation dialog will appear on the screen. By default, it contains settings corresponding to the system hatch style *Metal*.

2. Enter value *100* into field **Number**.
3. Enter the name of a style to be created— **Porcelain** — into the *Name* field.
4. Enter *1* in the **Scale** field. Do not activate the **Do not change** option, in order to enable the changing of its scale when creating a hatch of a given style in a drawing.
5. Enter **0** in the *Slope* field as a hatch must not be rotated relative to an absolute coordinate system of a drawing (a fragment). Activate the **Do not change** option, so as to make it impossible to change a hatch slope when creating a hatch in a drawing.
6. Since a hatch should be formed of thin lines, you can use an already existing group of lines. To set its parameters properly, click the **Edit...** button.

   A Hatch Line Properties Customizing dialog will appear on the screen. You must set there the parameters characterizing the location of the first group of lines in a hatch coordinate system. Since the group should be formed of thin lines, the **Thin** style is selected in the **System Styles** list.

   6.1. Enter *90* in the **Angle** field.

   6.2. Enter **0** in the *X* field.

6.3. Enter *0* in the **Y** field.

6.4. Enter **4** in the *deltaY* field.

6.5. Here the customizing of group 1 has been completed. Click the **OK** button.

The hatch line parameters dialog is now closed. A Hatch Style Creation dialog will appear on the screen. In a small dialog preview window, the current group (selected in a list) of lines is displayed and hatch appearance is displayed in a large preview window. While a hatch contains only one group, the images in both windows will be the same.

7. Click the **Add...** button to add the second group of lines to a hatch.

A Line Properties Customizing dialog will appear on the screen.

7.1. Select the **Thin** style in the **Line Styles** group.

7.2. Set the parameters of the second group of lines in accordance with Table 8.5 and close the Line Properties Customizing dialog.

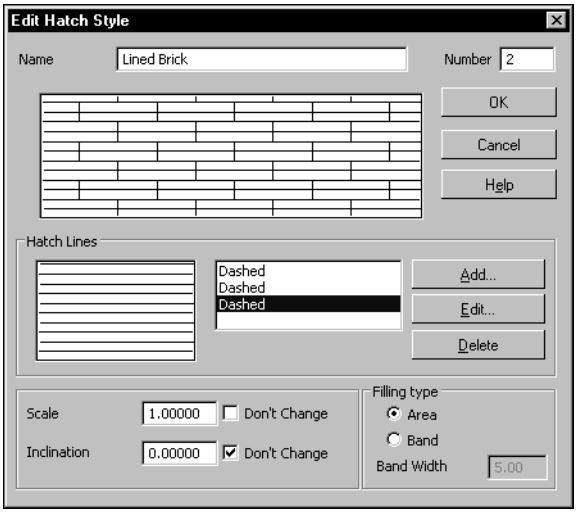


Fig. 8.6. Creating a Porcelain hatch style

8. Similarly, add the third and the fourth groups of lines in a hatch.

Customizing the *Porcelain* hatch style is completed (Fig. 8.6).

9. Close the Hatch Style Creation dialog by clicking the **OK** button.

A Hatch Style Set and Hatch Style Library Operation dialog will remain on the screen. The *Porcelain* hatch style created by you will appear in the *user_hatches.lhs* library.

10. Close the Style Set and Style Library Operation dialog by clicking the **Exit** button.

Exercise 8. Check of the hatch style created

Задание Check that the **Porcelain** hatch style created by you is customized properly.

1. Create a KOMPAS-3D graphic document.
2. Create a closed contour (a rectangle, a circle, etc.) in it, using the *Normal* system line style.
3. Apply the **Tools — Hatch** command.
4. Click in the **Style** field on the property bar.

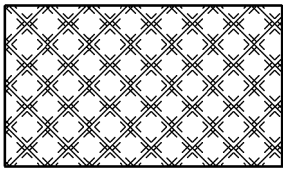
5. Select the **Another Style** line in the displayed list.
6. In the Current Style Selection dialog, which appears on the screen, click the **Library...** button.
7. In the File Opening dialog, which appears on the screen, select a library created by you *user_hatches.lhs*.
8. On the **Library** page of the Current Style Selection dialog select the library style name — *Porcelain* — and click the **Select** button.

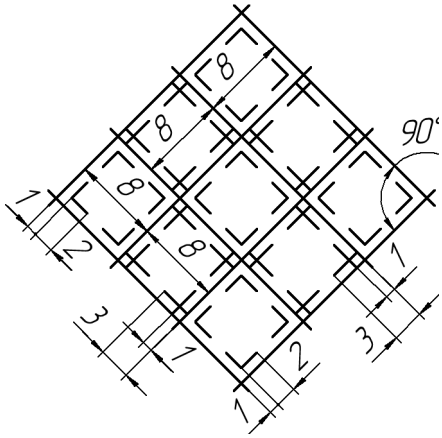
   The dialog will close and the selected hatch style will become a current one. It will be displayed in the **Style** field.
9. Make sure that the **Step** field, allowing the change of a hatch scale, is available on the properties bar, and the **Slope** field is not available.
10. Click the **Create Object** button on the Advanced Control Panel.
11. Look at the hatch created. Make sure that a hatch pattern is the same as that shown in Fig. 8.4, and the used line style is *Thin*.

If, creating a hatch, you selected a scale different from 1 on the properties bar, the distance between the lines will change in accordance with a specified factor.

Exercise 9. Creation of a Thermoplast hatch style

Create a **Thermoplast** hatch style (Fig. 8.7). Hatch line style – Thin.





a) b)

Fig. 8.7. Thermoplast hatch style:
a) sample of a hatch, b) size and location of hatch elements

This hatch consists of two groups of solid lines and four groups of dashed lines (Fig. 8.8).

A hatch coordinate system is a system, the X-axis of which coincides with one of the solid lines located at an angle of 45° from horizontal, and the Y -axis of which coincides with a solid line at an angle of 135°. In Fig.8.8 the hatch is rotated in such a way that the abscissa axis of its coordinate system would be located horizontally.

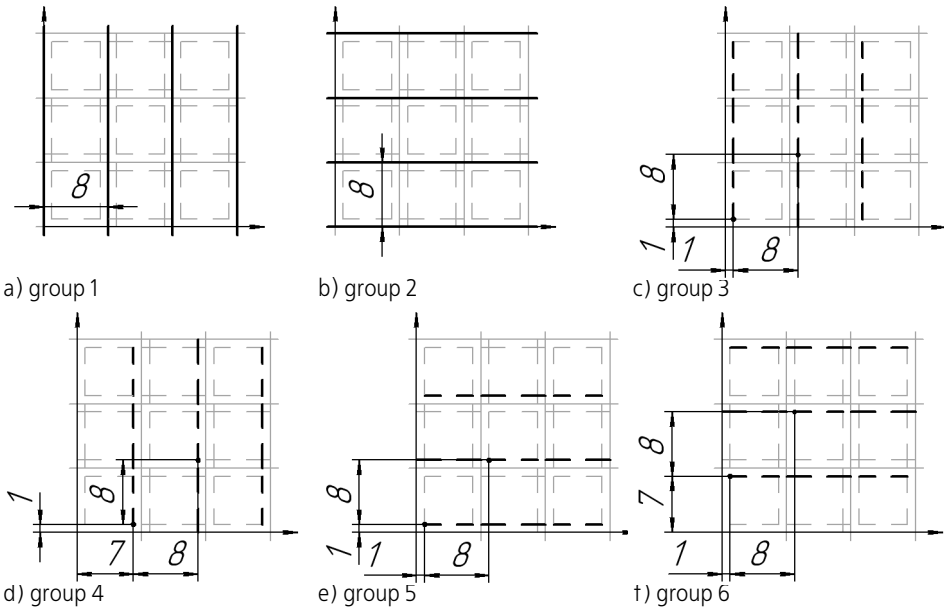


Fig. 8.8. Groups of lines forming a Thermoplast hatch:
a) group 1, b) group 2, c) group 3, d) group 4, e) group 5, f) group 6

Parameters characterizing the location of groups of lines in a hatch coordinate system are shown in Table 8.6.

Tab. 8.6. The parameters characterizing the location of groups of lines in a hatch coordinate system

Group	**Angle**	**X**	**Y**	**DeltaX**	**deltaY**
Group 1	90°	0	0		8
Group 2	0°	0	0		8
Group 3	90°	1	1	8	8
Group 4	90°	7	1	8	8
Group 5	0°	1	1	8	8
Group 6	0°	1	7	8	8

Groups 3–6 contain dashed lines. All of them are formed of the same dash-and-gap combinations. These combinations and dash-and-line lengths are shown in Fig. 8.9.

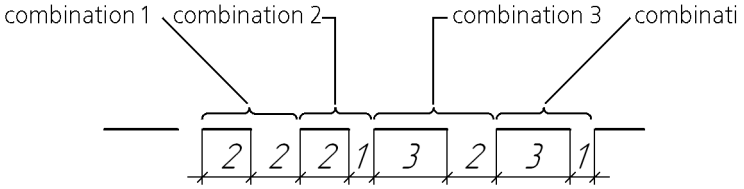


Fig. 8.9. Dash-and-gap combinations in dashed lines of Thermoplast hatch

1. Invoke the **Service — Style Libraries — Hatch Styles...** command.

   The Hatch Style Set and Hatch Style Library Operation dialog will appear on the screen.

2. Open the *user_hatches.lhs* library created when you did Exercise 1.

   2.1. Click button **Show Library**.

   2.2. Select the *user_hatches.lhs* file in the File Opening dialog, which appears on the screen.

   A full library name shall appear in the header of the active preview window; and in the window itself — a list of styles contained in this library.

3. Click the **Create Style** button.

Make sure that the *user_hatches.lhs* library window will be active. Otherwise, a new style will be added to a library (a set or a document) opened in a neighboring window.

A Hatch Style Creation dialog will appear on the screen. If, before the **Create Style** button is clicked, the existing *Porcelain* style was selected in the list of styles of the current library, its parameters are contained in the Style Creation dialog, i.e., the selected style is used as a prototype). In this case, using the **Delete** button, delete all lines except for the first one (**Thin**) from the list.

If the *Porcelain* style was not selected, the dialog contains the parameters corresponding to the *Metal* hatch system style.

4. Enter value *101* into field **Number**.
5. Enter the name of the style to be created— **Thermoplast**, in the *Name* field.
6. Enter *1* in the **Scale** field. Do not activate the **Do not change** option, in order to enable the changing of its scale when creating a hatch of a given style in a drawing.
7. Enter *45* in the **Slope** field as the hatch coordinate system is rotated in relation to the absolute coordinate system of a drawing (a fragment) by 45°. Activate the **Do not change** option, so as to make it impossible to change a hatch slope when creating a hatch in a drawing.
8. After performing the operations similar to those described in para. 6– 7, Exercise 7, edit the available group of thin lines and add a new group. Parameters characterizing the location of these groups in a hatch coordinate system are represented in Table 8.6. To monitor the correctness of your operations, compare the dialog that you see on the screen with the dialog shown in Fig. 8.10.

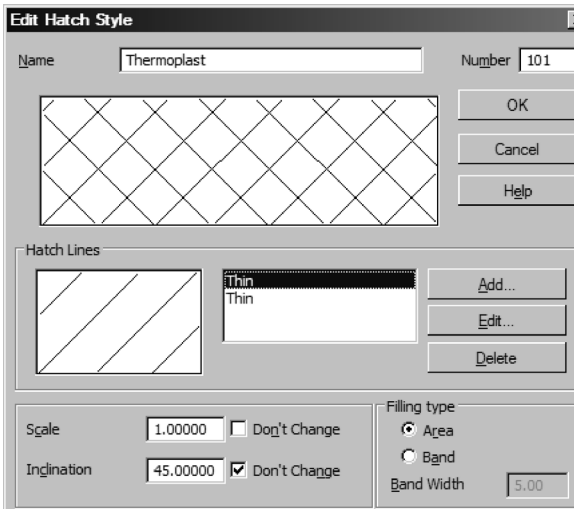


Fig. 8.10. Creating the first and the second groups of lines

9. Click the **Add...** button to add the third group of lines to a hatch.

   A Line Properties Customizing dialog will appear on the screen.

   The third group contains dashed lines. Since all available system lines are solid, you must create a custom line style.

   9.1. Click on the **All User Hatch Line Styles** window.

   9.2. Click the **New...** button which has become accessible.

   A Line Style Creation dialog will appear on the screen.

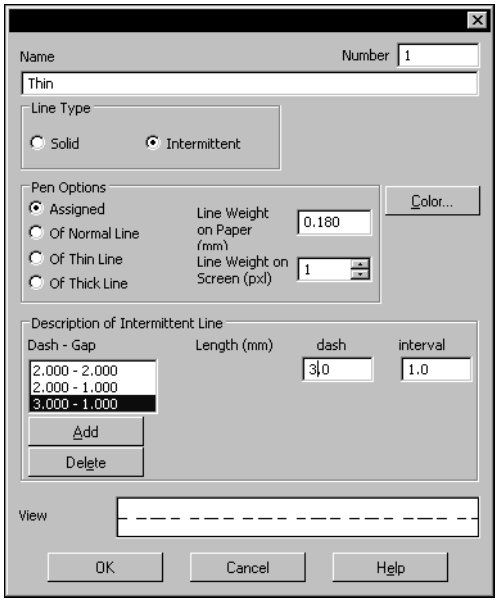


Fig. 8.11. Customizing a User's style

9.3. Enter *Thin Dashed* in the **Name** field.

9.4. In the **Curve Type** group select the **Dashed** option.

9.5. Select the **Thin Line** option in the **Pen Options** group.

9.6. Click the **Color...** button and set black color for the line.

9.7. The line consists of dash-and-gap combinations (see Fig. 8.9 on p. 100). The **Dash-Gap** list contains by default one combination, the dash-and-gap lengths in which are the same and equal to 1 mm. Enter the value *2* in the dash length field and the gap length field. This change will be sent to the **Dash-Gap** list and also be displayed in a preview window.

9.8. Click the **Add** button. The second dash-and-gap combination will appear in the list. Edit it according to Fig. 8.9.

9.9. Similarly, add the third and the fourth combinations.

9.10. Customizing of the User's style is completed (Fig. 8.11). Click the **Exit** button in the dialog.

Line Style Creation dialog will close. A Line Properties Customizing dialog will remain on the screen.

10. The **All User Hatch Line Styles** list contains the name of a line style created by you — **Thin Dashed**. Select this style and enter the values characterizing the location of the third group of lines in a hatch coordinate system (see Table 8.6 on p. 100).

11. Customizing the third group of lines is completed. Close the Line Properties Customizing dialog by clicking the **OK** button.

A Hatch Style Creation dialog will appear on the screen. A **Thin Dashed** line will appear in the list of lines, and an image of the respective group of lines will appear in the hatch preview window.

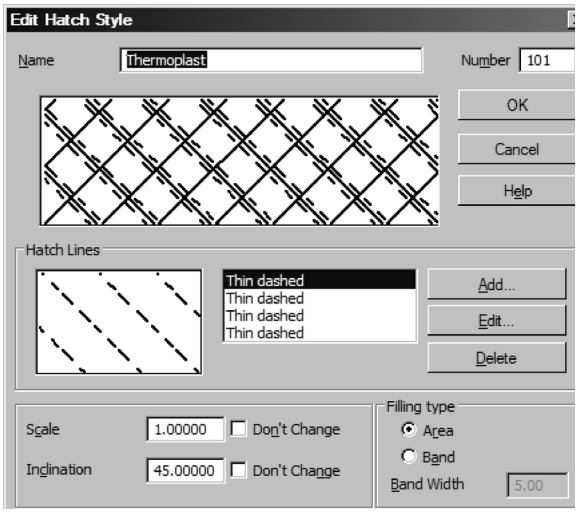


Fig. 8.12. Creating the third and the fourth groups of lines

12. Press button **Add...**.

13. In the Line Properties Customizing dialog, which appears on the screen, select the **Thin Dashed** style and set the location parameters for the fourth group of lines. Then close the dialog by clicking the **OK** button. To monitor the correctness of your operations, compare the dialog that you see on the screen with the dialog shown in Fig. 8.12.
14. Similarly, add the fifth and the sixth group of lines to a hatch.

    Here, creating a *Thermoplast* hatch style is completed (Fig. 8.13).

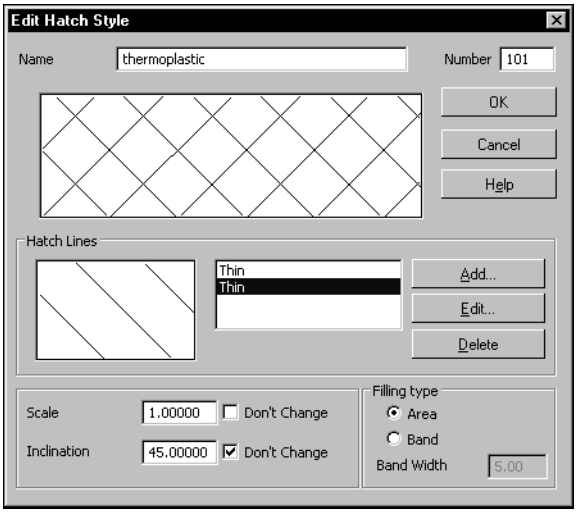


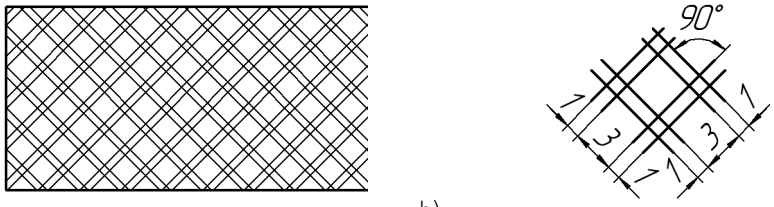
Fig. 8.13. Creating the fifth and the sixth groups of lines

15. Close the Style Creation dialog by clicking the **OK** button.

    A Hatch Style Set and Hatch Style Library Operation dialog will remain on the screen. Now the current *user_ hatches.lhs* library contains two styles: *Porcelain* and *Thermoplast*.
16. Close the dialog by clicking the **Exit** button.
17. Make sure that the style is created correctly by performing the operations similar to those described in the Exercise 8 on p. 98.

Exercise 10. Creating hatch styles. Test

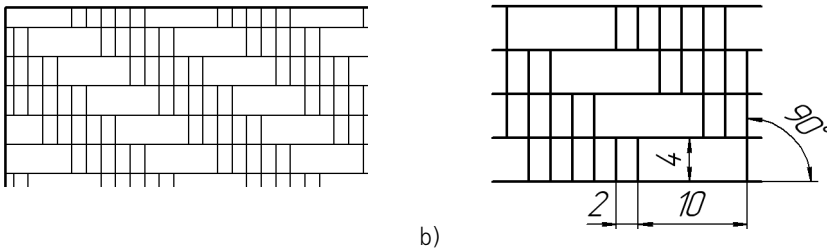
Задание Create a hatch style **Insulating Layer** (Fig. 8.14). Hatch line style – Thin.



a) b)

Fig. 8.14. Insulating Layer hatch style:
a) sample of a hatch, b) size and location of hatch elements

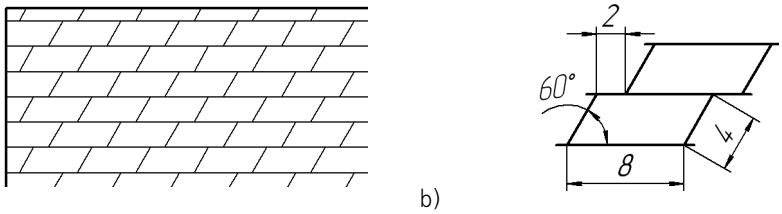
Задание Create a hatch style **Salts** (Fig. 8.15). Hatch line style – Thin.



a) b)

Fig. 8.15. Salts hatch style:
a) sample of a hatch, b) size and location of hatch elements

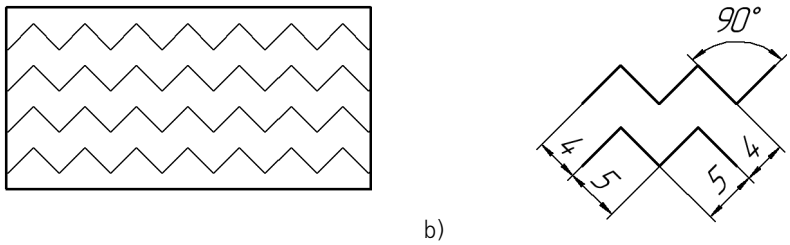
Задание Create a hatch style **Granite** (Fig. 8.16). Hatch line style – Thin.



a) b)

Fig. 8.16. Granite hatch style
a) sample of a hatch, b) size and location of hatch elements

Задание Create a hatch style **Resin** (Fig. 8.17). Hatch line style – Thin.



a) b)

Fig. 8.17. Resin hatch style:
a) sample of a hatch, b) size and location of hatch elements

Chapter 9.
Custom Text Style

To create a text style, perform the following operations.

1. Call command **Service — Style Libraries — Line Styles...**

   A Style Set and Style Library Operation dialog will appear on the screen.

2. Select a new style storage location.

   To select a storage location, use buttons **Show Library...**, **Show Set...** or **Show Document**. Style storage locations are described in Section 6.1 on p. 70.

3. Click the **Create Style** button.

   The dialog for creating and editing named groups will appear on the screen.

4. Customize the parameters of a new style (see Section 7.1) and close the dialog.

   The name of the style created will appear in an active preview window of the Style Set and Style Library Operation dialog.

After reviewing the material described in Section 9.1, it is recommended to do exercises 11–13 from Section 9.2. It will allow you to practice the described technique of creating text styles.

9.1. Customizing a Text Style

A text style is customized in the Style Creation and Edition dialog (Fig. 9.1). The control elements of this dialog are represented in Table 9.1.

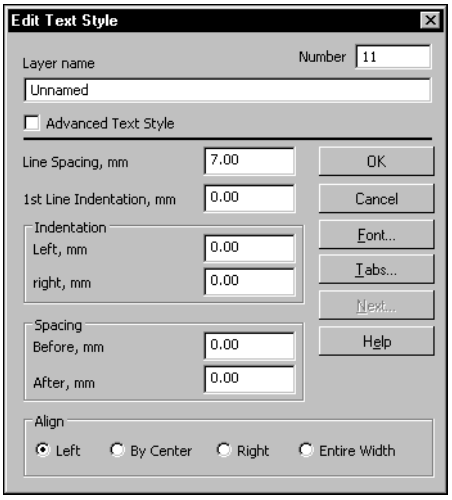


Fig. 9.1. Text Style Creation and Editing dialog

Tab. 9.1. Text Style Creation and Editing dialog

Element	Description
Name	A field for entering (editing) a style name. It is recommended that informative style names be given which fairly represent the function of such styles. In the future this will simplify the search for a style in a list.
Number	A field for entering (editing) a style number. The rules of style numbering are set forth in Section 6.2.4 on p. 78.
Advanced Text Style	Option allowing the setting of additional parameters of a text style. After activating it, the **Next...** button, which activates an Advanced Text Style Customizing dialog, becomes available.
Line Spacing	The distance between the base text lines in a paragraph (see Fig. 9.2).
1st Line Indent	Indent to the right in the first line of a paragraph (see Fig. 9.2)*.
Offset at left Indentation at Right	Distances between the left and right borders of the entry field and the respective text borders (see Fig. 9.2) *.
Spacing	The distance between two contiguous paragraphs. It is formed from two values — **an interval after** the preceding paragraph and **the interval before** the following paragraph.
Alignment	A group of switches that allows to set the method to align paragraphs (**to the left border**, **to the right border**, **centering**, and **alignment by two borders**).
Font	The button allowing customizing of font options (see Section 9.1.1).
Tabulation	The button allowing customizing tabulation options (see Section 9.1.2).
Next...	The button allowing customizing an advanced text style (see Section 9.1.3).

* Note that due to the presence of spaces in font characters, which are necessary to prevent the "sticking" of letters to each other, this distance may slightly differ from that set in the dialog.

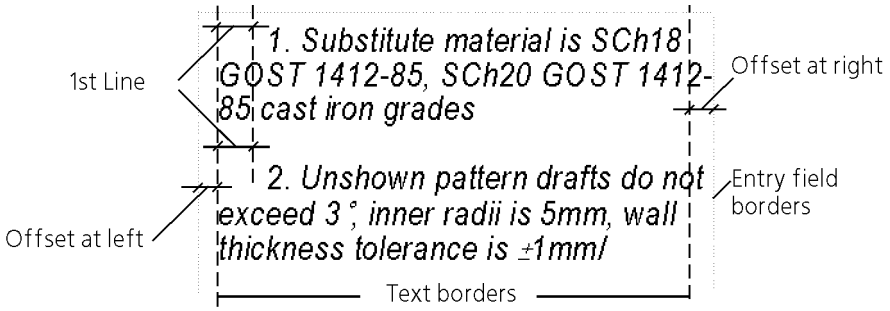


Fig. 9.2. Paragraph Properties

9.1.1. Font

Font options are customized in a dialog (Fig. 9.3) which appears after clicking the **Font...** button of the Text Style Creation and Edition dialog.

Control elements of the Font Options Customizing dialog are represented in Table 9.2.

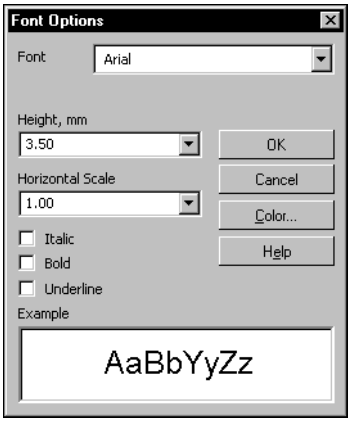


Fig. 9.3. Font options setup dialog

Tab. 9.2. Font options setup dialog

Element	Description
Font	A list allowing selection of any font set in Windows except for bitmap fonts.
Height	A field for entry or selection of font size. Note, that the size of the standard drawing font is the vertical size of a capital letter, expressed in mm.
Compression	A field for entry or selection of font spacing. If spacing is less than 1, this means to decrease of the width of letters and spacing between them by the specified factor, and if more than 1 , to increase.
Color	A button for selecting the color of text characters.

Tab. 9.2. Font options setup dialog

Element	Description
Italic	An option allowing the setting of an italics style of characters.
Bold	An option allowing the setting of a thickened (bold) style of characters.
Underlined	An option allowing the setting of character underlining.
Example	A preview window for a font with current options.

9.1.2. Tabbing

Tabbing is customized in a dialog (Fig. 9.4) which appears on the screen after clicking the **Tabs...** button of the Text Style Creation and Edition dialog.

Control elements of Tabbing Customization dialog are represented in Table 9.3.

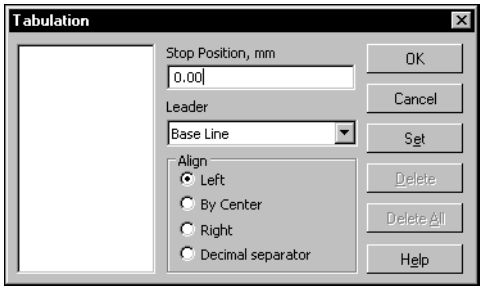


Fig. 9.4. Tabulation Settings Dialog

Tab. 9.3. Tabulation setup dialog

Element	Description
Ref.No.	Sets the tab indents in millimeters.
Leader	A list permitting one to select a method of entering tabbing options.
Alignment	A group of switches that manages the method to align text relative to the position of tabulation (Table 9.4). Text alignment by tabbing can be used, for example, for constructing a table of contents.
Set	A button allowing addition of the adjustable tab in a list.
Delete	A button allowing deletion of the selected tab.
Delete All	A button making it possible to clear at once the entire list of tabs.

Tab. 9.4. Methods to align text relative to the position of tabulation

Method	Description	Example
Left	A part of a line entered after a tab is located to the right from the tab position. Several lines beginning from this tab will be left-aligned.	Columnar layout. Each paragraph consists of one line and contains the same number of tabs and columns.
Centered	A line part entered after a tab is positioned symmetrically about the tab position. the tab position.	Headers. Tabs are entered in each line before the header text.
Right	A line part entered after a tab is positioned to the left from the tab position, i.e., this part of a line ends in a tab position. Several lines containing such tabs will be right-aligned.	Contents. A right tab with fill characters is entered between a header text and a page number.
Decimal point	A point that is entered in any place of a line after a tab is positioned at the tab position.	Multilevel lists, embedded contents.

9.1.3. Advanced Text Style

The advanced text style is used for texts entered into the columns of the document title block or into the cells of other tables with fixed dimensions. The advanced text style sets relationship between the number of text lines: one, two or three and its parameters: character height, character spacing and line spacing.

The advanced text style is customized in the dialog (Fig. 9.5), which appears after clicking the **Next...** button of the Text Style Creation and Editing dialog.

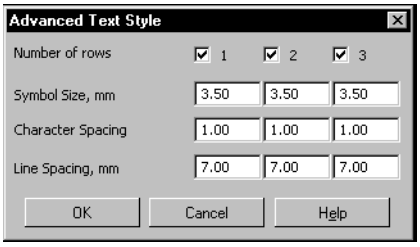


Fig. 9.5. Text Advanced Style Setup Dialog

The advanced text style is used only in tables, mainly for description of different cases of text input in the columns of the document title block, into a cell of the table with fixed dimensions, etc. When using a text style containing settings of an advanced text, the advanced style parameters are ignored outside tables.

For example, you can create text style *Normal* with 3.5 mm character height and adjust the advanced text style within text style *Normal* as follows: symbol size in a single line text — 10 mm; in a two-line text — 7 mm and in a three-line text — 5 mm. It means that the height of

text characters in a table cell, for which *Normal* style was applied, will be 10 mm if the text is of a single line, 7 mm if the text is of two lines, 5 mm if the text is of three lines and 3.5 mm if the text contains four or more lines. For example, if *Normal* style is applied to the text of a text document, then regardless of the number of rows the symbol size will be equal to 3.5 mm.

Control elements of the Advanced Text Style Customizing dialog are represented in Table 9.5.

Tab. 9.5. Advanced Text Style Customizing dialog

Element	Description
Number of Rows	A group of options making it possible to specify the possible number of text lines.
Symbol Size	Fields for entry of the height of characters of the text consisting of a specified number of lines.
Compression of characters	The fields for entering character spacing in a text consisting of the specified number of lines.
Line Spacing	The fields for entering line spacing in a text consisting of a specified number of lines.

If a text consists of more lines than set when the advanced text style was customized, text options are ignored.

9.2. Practice in Creating and Editing Text Styles

This Section contains exercises for mastering the technique of creating custom text styles and editing system text styles.

Exercise 11. Creating a text style library. Independent work

Задание Create a text style library user_texts.lts.

1. Invoke the command **Service — Style Libraries — Text Styles...**
2. Create a text style library with the name *user_texts* in the same way as you created a line style library in Exercise 1.

   Without closing the Text Style Set and Text Style Library Operation dialog, proceed to doing the next exercise.

Exercise 12. Creating header styles and body text style

Задание Create text styles allowing formatting the documents in accordance with a layout model shown in Fig. 9.6. Non-italicized Arial Bold font must be used in styles.

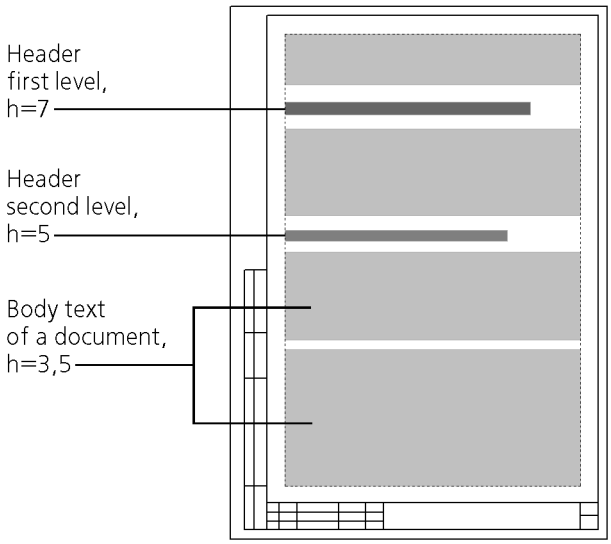


Fig. 9.6. Page layout

1. Click the **Create Style** button in the Text Style Set and Text Style Library Operation dialog.

Make sure that the *user_texts.lts* library window is active. Otherwise, a new style will be added to a library (a set or a document) opened in a neighboring window.

A Text Style Creation dialog will appear on the screen.

2. Enter value *100* into field **Number**.
3. Enter the name of a style to be created— **Body text** in the *Name* field.
4. Enter **5** in the *Line Spacing* field.
5. Enter *0* in the **First Line Indent** field as, according to the layout model, the first line of a paragraph does not have any indent.
6. Enter *0* in the fields of the **Indentation** group too, as the paragraphs of the body text begin and end directly at the entry border.
7. Enter *2* in the fields of the **Spacing** group.
8. Select the **Entire Width** option in the **Alignment** group, as the paragraphs of a body text are aligned at both sides (neither paragraph border is “ragged”).
9. Click the **Font...** button to set font options for a normal text.

   A Font Options Customizing dialog will appear on the screen.

   9.1. Select the **Arial** option from the **Font** list.

   9.2. Enter or select **3.5** in the *Size* field.

   9.3. Enter or select **1** in the *Spacing* field.

   9.4. Click the **Color...** button and select black color for the text.

   9.5. Do not activate the **Italics**, **Bold**, **Underlined** options.

   9.6. Close the Font Options Customizing dialog by clicking the **OK** button.

A Text Style Creation dialog will remain on the screen.

The option **Advanced Text Style** allows setting of some text options, depending on the number of lines in it. This setting is used for creating styles for the texts located in the table cells. In this case, advanced text style options need not be set.

10. Here the creation of the *Body text* style is completed. Close the Style Creation dialog by clicking the **OK** button.

    A Style Set and Style Library Operation dialog will remain on the screen. The name of the style created by you — *Body text* — is displayed in the active preview window.

11. Click the **Create Style** button.

    A Text Style Creation dialog will appear on the screen.

12. Enter value *101* into field **Number**.
13. Enter the name of a style to be created — **Header1** — in the *Name* field.
14. Enter **10** in the *Line Spacing* field.
15. Enter **0** in the field *First Line Indent*.
16. Enter *0* in the fields of the **Indentation** group too.
17. Enter the following spacing values: **Before Paragraph** — *12*, **After Paragraph** — *8*.

When setting a spacing, you must remember that a spacing between neighboring paragraphs is formed from the spacing after the preceding paragraph and the spacing before the following paragraph.

18. Select the **Left** option in the **Alignment** group. Selection of the **Entire Width** option is not recommended, as it usually results in disproportional increase of spaces between the header words, the paragraph of which consists of several lines (Fig. 9.7).

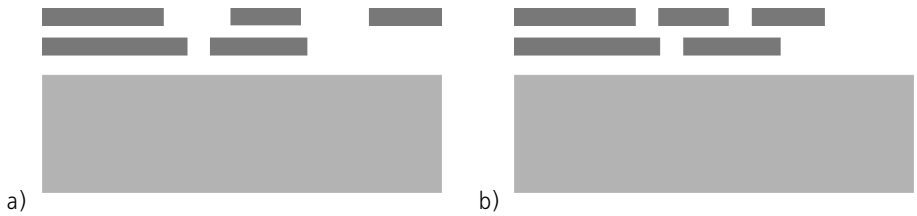


Fig. 9.7. Alignment of the header paragraph: a) to entire width b) to the left.

The alignment of body text paragraphs by width is also achieved by increasing the spaces between words. But due to the smaller size of characters and the presence of hyphenation, the lines of the body text contain more words than the header lines. Therefore, the difference between the spaces in the body text lines is inconsiderable.

19. Click the **Font...** button to set font options for the first level header.

    A Font Options Customizing dialog will appear on the screen.

    19.1. Enter or select **7** in the *Size* field.

    19.2. Customize the rest of the options in the same way as you did for a body text (see Sections 9.1, 9.3– 9.5).

    19.3. Close the Font Settings dialog.

A Text Style Creation dialog will remain on the screen.

Do not activate the **Advanced Text Style** option, as in the case of customizing of a body text.

20. Here the creation of the *Header1* style is completed. Close the Style Creation dialog by clicking the **OK** button.

    A Style Set and Style Library Operation dialog will remain on the screen. Two names of styles are displayed now in the active preview window — *Body Text* and *Header1*.

21. Independently create a style for the second level headers in accordance with a layout model.

Exercise 13. Check of text styles created

Check whether the text styles created by you – **Header1**, **Header2** and **Body Text** – are customized correctly.

1. Create a new KOMPAS-3D text document.
2. Enter 6 paragraphs of a text of medium length (so as they, for example, would occupy half a page). A system text style is applied by default to all paragraphs.
3. Select the first paragraph.
4. Apply to this paragraph the *Body Text* style from the *user_texts.lts* library created by you.
   4.1. Invoke the **Format — Style...** command.

   A Current Text Style Selection dialog will appear on the screen.

   4.2. Click the **Library...** button in the **Show** group.

   4.3. In the dialog that appears on the screen, select the **user_texts.lts** file and click the *Open* button.

   The full name of the library selected will appear in the Current Text Style Selection dialog. The list of styles contained in it will be displayed on the **Library** page.

   4.4. Select the *Body Text* style in the list and click the **Select** button.

   The Current Text Style Selection dialog will close. Make sure that the layout of the paragraph selected conforms to settings of the *Body Text* style: Arial font, capital letter size — 3.5 mm, alignment by width.
5. Similarly, apply the *Header1* style to the second paragraph , and the *Header2* style to the fourth paragraph.
6. Apply the *Body Text* style to the remaining paragraphs.
   6.1. Select the required paragraph and invoke the **Format — Style...** command.

   6.2. Activate the **Library** page of the dialog which appears.

   This contains a list of links to the library styles already used.

   6.3. Select the *Body Text* style in the list and click the **Select** button.

   The Current Text Style Selection dialog will close, and the selected paragraph will be properly formatted. Thus, the activation of the library is not required for repeated selection of a style from this library.
7. Make sure that

- Character size (vertical size of capital letters) and line spacing (distance between base lines of neighboring lines) in all paragraphs conform to the parameters specified in the process of customizing styles,
- Alignment of paragraphs corresponds to the options selected when styles were customized,

8. Save the document as *text.kdw*.

Exercise 14. Editing of system text styles in the current document

As you know, system line styles, hatches, and texts are supplied with the KOMPAS-3D system. While editing of system styles of lines and hatches is limited (a user can change only the color and width of system lines, which, in turn, affects the view of the hatches used by these lines), system text styles allow for a very large range of editing options.

The second difference between system lines (hatches) styles and system text styles is as follows. The settings of system lines and hatches are saved in the system and applied to all open documents at the same time. The settings of system text styles are saved in the documents and, therefore, may differ in different documents.

Задание In the document text.kdw, edit the system text style for table headers. Use a non-italicized Arial Bold for the style. Character size – 3.5 mm. The text in a cell must be left-aligned.

1. Open the *text.kdw* document created in the previous exercise.
2. Create an arbitrary table in it with a header in the first line and fill the table cells. The texts in the table header cells have a *Table Header* system style with default settings.
3. Exit the table editing mode.
4. Invoke the **Service — Options... — Current Text Document — Table Header** command.

   The right part of the dialog that appears on the screen contains control elements which allow to customize a *Table Header* text system style.
5. Enter **5** in the *Line Spacing* field.
6. Enter *1* in the fields of the **Indentation** group. Indents are distances from the text in a cell to the left and right borders of such a cell.
7. Enter the values in the **Spacing** group as follows: **Before Paragraph** — *2*, **After Paragraph**— *0*.
8. Select the **Left** option in the **Alignment** group.
9. Click the **Font...** button to customize font options for a table header.

   A Font Customizing dialog will appear on the screen.

   9.1. Select the **Arial** option from the **Font** list. Then the **Different from Default Font** option is activated. Let this option remain activated. Deactivation of this option makes it possible, when customizing a style, to quickly select the font set for this document as the default font.

The default font for the current document is also selected in the Options Customizing dialog. To do this, you must select the **Default Font** option in the left part of the **Current Text document**.
In this case, the stated customizing is not required.

9.2. Enter or select **3.5** in the *Size* field.

9.3. Enter or select *1* in the **Spacing** field.

9.4. Activate the **Bold** option and deactivate the **Italics** and **Underlined** options.

9.5. Clicking the **Color...** button, set a black color for the text.

9.6. Close the Font Customizing dialog.

10. Customizing of a *Table Header* system text style is completed. Close the Options Customizing dialog by clicking the **OK** button.

    You will see that the format of the first line of the table has changed: the appearance of the text and its location in cells correspond now not to the default settings of the *Table Header* style, but to the settings specified by you.

    The style of the text in other cells will not change as it was not edited.

11. In the *text.kdw* document edit independently a system text style for table cells. Use non-italicized Arial Bold font in the style. Character size — 3 mm. The text in a cell must be left-aligned.

12. Make sure that after changing a *Table Cell* system style, the appearance of the text in table cells has changed in accordance with the set parameters.

13. Save the document. In doing so, style settings made by you will be also saved. They will be used for table headers and cells in this document when such document is opened again, including at other workstations.

Exercise 15. Editing system text styles in new documents

Задание Edit the **Table Header** and **Table Cell** system text styles, intended for default use in new text documents. Styles must meet the same requirements as the styles with the same name in the text.kdw document.

1. Invoke the **Service — Options... — New Documents** command.
2. Open the **Text Document** section in the right part of the current dialog.
3. Select the **Table Header** option in this section.

   The right part of the dialog will display control elements for customizing the *Table Header* system text style, which will be used by default in new text documents.

4. Do Items 5– 9 from Exercise 14.
5. Select the **Table Cell** option in the **Text Document** section, and similarly customize the system style of the same name.
6. Close the Options Customizing dialog by clicking the **OK** button.

Exercise 16. Check on customization of system text styles.

Задание Check system text styles **Table header** and **Table Cell** in a new text document for proper default settings.

1. Create a new text document.
2. Invoke the **Service — Options... — Current Text Document** command.
3. Sequentially selecting the **Table Header** and **Table Cell** options in the left part of the dialog, make sure that the new document has acquired all required settings of the text style with the same name.

   You can also create a table in the new document, and after filling its cells check whether a text has acquired by default the required options.

   Thus, if the text styles used by you differ from default styles, you must perform the following operations.

- ▼ Customize the system text styles for new documents, so that they have the required options.
- ▼ Create the missing text styles (for headers of sections and subsections, captions for illustrations, etc.) and save them in a custom text style library.

Part III

Document Styles

Chapter 10.
Title Block and Document Layouts

The Layout is assigned to each document depending on its type, e.g., design or construcrion drawing, process flow chart, etc.

By default, the first sheet of a KOMPAS-3D drawing has the following Template: *Title Block (First Sheet) ISO 7200:2004*, and the first sheet of a text document has the follwoing template *Title Block (First Sheet) ISO 7200:2004*; the subsequent sheets of drawings and text documents are arranged under the following template: *Title Block (Next Sheets) ISO 7200:2004*.

The Layout of each document sheet can be changed at any time.

10.1. General Information

Layout is a part of a drawing or a text document of KOMPAS-3D system including a Title Block and borders (external and internal). The Layout of text document also include info about the Text Input Field dimensions, and the drawing Layout include info about Revision Table availability and the rules of its location on the sheet.

The Title Block includes one or several tables, the cells of which have special settings. These settings make available some service functions (automatic data input, data transfer from one cell to others, etc.).

The using of Layouts significantly facilitates creation of typical documents: it means that you are not required to draw out new borders and tables of the Title Block as they are already included into the Layout assigned to this document.

KOMPAS-3D includes standard Layouts for design documents. These Layouts are stored in the System Layout Library : file *Graphic_EN.lyt* that is stored in subfolder *\Sys* of the main system folder.

The package also includes file *Vector.lyt*. This file contains the Layouts of documents to be printed using vector devices.
To provide operation of some libraries, e.g., SPDS Designations library, some Special Layouts, different from the system Layouts, are required. These Layouts are included into the libraries packages to be supplied. When installing these libraries the corresponding Layout Libraries will be placed in subfolder *\Sys*.

User can edit the existing Layouts and create new ones. Creation of custom Layout Libraries is also possible. These libraries can include both new and existing Layouts, i.e., the Layouts can be copied between the libraries.

As long as the Title Blocks are the components of the document Layouts, they are stored in the same libraries **.lyt* as the Layouts. The Title Blocks are created and edited as separate objects. The Layout contained in any library **.lyt* can include only the Title Block stored in the same library.

Title Blocks and Layouts of the drawings and text documents are handled using the dialogs called by the commands, correspondingly:**Service — Style Libraries — Types of Title Blocks**, **Service — Style Libraries —Layouts of Drawings** and **Service — Style Libraries**

— **Layouts of Text Documents**. The control elements of these dialogs are practically analogous to that of the dialogs for use of object style library sets (see Table 6.2 on p. 72). The difference is that instead of the group of three buttons — **Show Set**, **Show Library**, **Show Document** — it has only one button — **Show Library** because the Title Blocks and Layouts, contrary to styles, can be stored only in libraries.

When copying a Layout from one library to another, the Title Block included into this Layout is also copied.
You can assure yourself of this performing Exercise 18 from Chapter 11.

The dialog of the Drawing Layout Library use is shown on Figure 10.1.

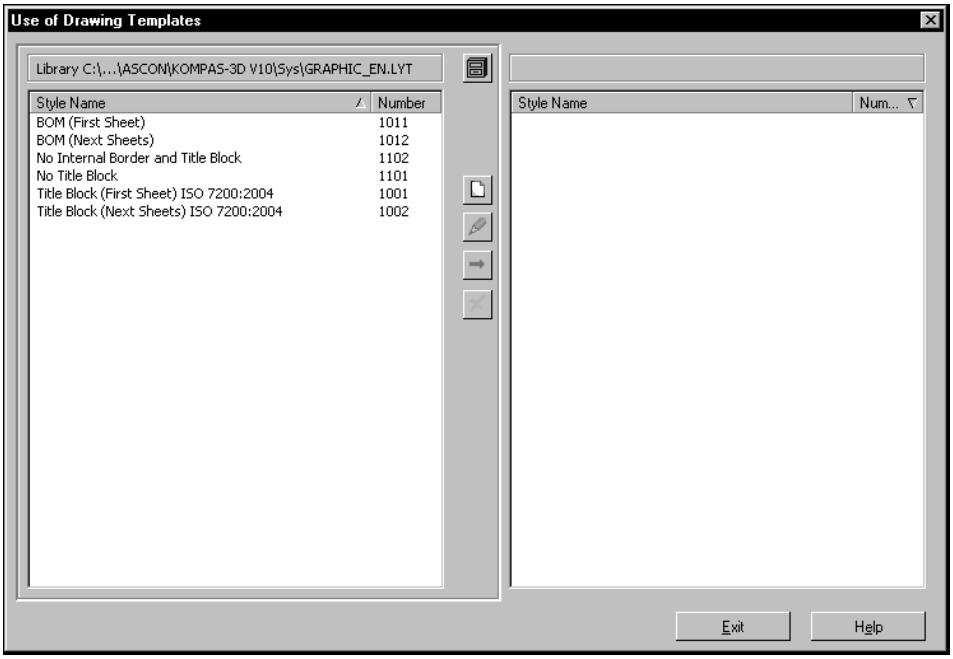


Fig. 10.1. Dialog of drawing layout library use

10.1.1. Storing Layout Parameters in Document

Storing of document Layout in the document itself is not provided. When assigning a Layout to a document, a link to an external library file **lyt* containing the selected Layout is created in this document.

All links available in the current document, including the links to the Layout Libraries, can be viewed on the page **External Links** of the document summary dialog. Use command **File — Properties...** to activate this dialog.

The document created on one work station will be correctly displayed on another work station only when the following conditions are fulfilled.

- A Layout library, to which the document refers, is available on the work station. The library should be stored in a folder, the path to which is indicated in the link, or in a folder, where the document is stored.
- A Layout with the required number is available in the library (see the next Section for information about the Layout numbers).

  E.g., there is a document with the standard Layout , i.e., a Layout from the system library, which was not edited by User. This document can be transferred to another work station without the Layout Library provided that this library is available on that work station and it includes the same (unedited) Layout.

  If a custom Layout (an edited Layout from the system library or a Layout from a custom library **.lyt*) is assigned to the document, then, in case of document transfer to another work station, it is **obligatory** to transfer there also the required Layout Library.

  If the Layout Library, to which the document refers, is not found and if the library does not include the required Layout, then the borders and tables of the Title Block will not be displayed in the opened document.

  If the library does not include the Title Block used in the Layout, the Title Block tables will not be displayed in a document with such a Layout.

  It can happen that the opened document has obviously a “foreign” Layout: table location and dimensions do not correspond to the sheet format, tables themselves do not correspond to the document type, etc. It means that the necessary library is found and it includes a Layout with the required number. However, a Layout different from the one used in the document is stored in the library under this number. The following methods can be recommended to correct the situation.
- If a document was moved from another work station, the Layout Library should be taken from that work station and placed into the same folder, where the document is stored. Then you can open the document again.
- If a document was not moved from another work station or the document source is unknown, examine the document and try to understand to which type of documents it belongs. Then find an appropriate Layout in the Layout Library and assign it to the document. Each document stores the data entered into the columns of its Title Block. If the Title Block of the selected Layout has the same columns, they will be filled with the data stored in the document.

10.1.2. Number of Title Block and Layout in the Library

Each Title Block and each Layout has its number, which is assigned to them when created.

The number is an unique attribute of the Title Block (Layout).

One and the same library cannot contain two Title Blocks with the same numbers. The reason is that the Title Block is included into a Layout just via its number.

One and the same library cannot contain two Layouts with the same numbers. The reason is that when assigning a Layout to a document, a link to this Layout will be included into the document. The link includes the following data: library full name and the number of a Layout from it.

Besides, the number of a Layout assigned to a document is important for compatibility with the previous versions, as well as for KOMPAS-3D application development using language tool kit.

Numbers from 1 to 100 are reserved for standard Layouts, so when creating new Layouts it is recommended to use numbers starting from 101.

The numbers of Title Blocks and Layouts contained in the library can be the same or different — it does not matter. E.g., the numbers of Title Blocks in library *Graphic_EN.lyt* coincide with the numbers of Layouts, which use these Title Blocks, but this is done only for usability.

At an attempt to put into a library (by creation or copying) the Title Block, the number of which coincides with the number of one of the Title Blocks in this library, a warning dialog will appear on the screen. This dialog is analogous to the dialog warning about the style existence in a library (see Fig. 6.6 on p. 78). This dialog also includes the titles of library objects (Title Blocks in this particular case) having the same numbers, as well as control buttons (see Table 6.4 on p. 78).

When inserting a new or copied Layout into a library, the presence of the copied Title Block in this library is checked first and then — the presence of the copied Layout.

If an object (Title Block or Layout) with the same number and the title as the object to be added exists in the library, a request to overwrite the object , i.e., to replace the old object with a new one, will appear on the screen. You can confirm or reject the overwrite.

If a probability of Layout exchange among several libraries is high enough, make sure that all Layouts (as well as Title Blocks) in these libraries have different numbers. It will help to prevent the conflict situations described above.

10.1.3. Recommendations on Document Layout Creation

The process of the document Layout creation includes two main steps:

1. Title Block creation
2. Layout creation using this Title Block.

You can create your own library **.lyt* to store a new Title Block and Layout. The process of Layout Library creation is analogous to the Style Library creation (see Section 6.2.1 on p. 73).

If a newly created Title Block (Layout) is a modification of an existing object, then this existing object can be used as a Prototype (see Section 10.3.2 on p. 134).

Prior to proceed to the Layout creation, it should be thought over carefully. Particularly, it refers to the Title Block tables, as their cells should be set up correctly (see Sections 10.2.1, 10.2.2).

It is recommended to test the created Layout carefully and then immediately correct the detected errors. It is due to the fact that the introduction of alterations into Layouts that have been already assigned to documents usually takes a lot of time.

Considering that the document Layout is a relatively complex object, special skills are required to handle it. That's why it is recommended to get acquainted with the present Section of the Manual and create several trial Layouts performing the Exercises in Chapter 11, prior to creation of the Layouts to be used for documentation issue in your Company.

10.2. Title Block Creation

A Title Block being a part of the document Layout is a special compound object of KOMPAS-3D. The Title Block can include one or several tables. These tables have only one dissimilarity from usual tables. It consists in the fact that during creating of the Title Block table each cell should be set up in a special way (see Section 10.2.2 on p. 126). The fill-in process for a document Title Block table is the same as the fill-in process of a usual table.

The general procedure to create a new Title Block is as follows.

1. Call command **Service — Style libraries — Types of Title Blocks...**The dialog for working with attribute types will appear on the screen.
2. Open an existing library or create a new library, where a new Title Block will be included.
3. Click button **Create Style** to proceed to creation of a new Title Block in the current library.

   The Title Block creation dialog will appear on the screen (Fig. 10.2).

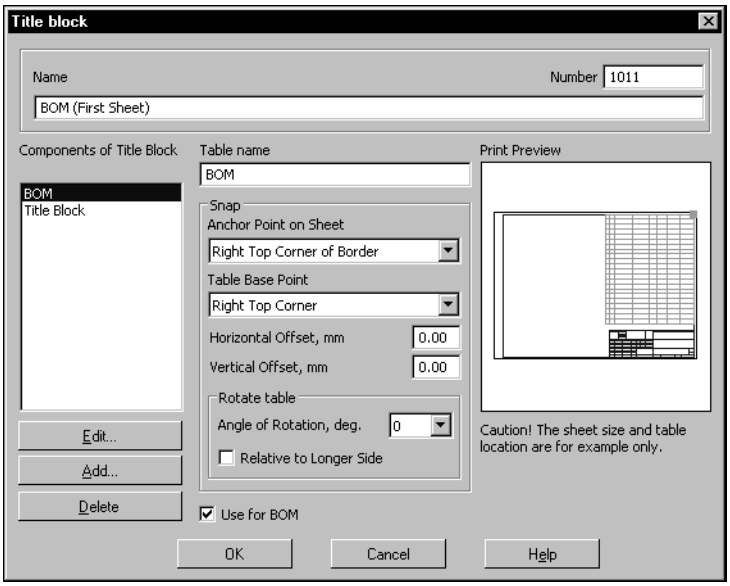


Fig. 10.2. Title block creation and editing dialog

4. Enter the name and the number of a new Title Block. You can use any name for the Title Block. Usually, it contains brief information about the Title Block (e.g., standard and application area). The rules of Title Block numeration are specified in Section 10.1.2 on p. 122.
5. Click button **Add** to proceed to creation of the first table of the Title Block.
6. Create and set up the first table of the Title Block (see Sections 10.2.1, 10.2.2).
7. Save the created table and close its window.

   The system will return to the Title Block creation dialog.

   The name of a newly created table (it is displayed in the Title Block creation dialog field having the same name) — «Unnamed».
8. Enter the name corresponding to the table purpose into field **Table Name**.

9. Set up location of the created table on the page in the Title Block creation dialog (see Section 10.2.3 on p. 133).
10. If the created table is used to input BOM items, then enable option **Use for BOM**[1].
11. Add the required number of tables into the Title Block and set up their location repeating items 5–7 as necessary.
12. Close the Title Block creation dialog.

    The system will return to the Title Block use dialog. The name of the created Title Block will appear in the list of Title Blocks of the current library.
13. Close the Title Block use dialog.

It is expected that the User proceeding to the Title Block table development possesses good skills to use tables in the documents of KOMPAS-3D system. That's why only specific options and options having a particular impact on the Title Block tables, but not all options, are described in Section 10.2.1.

10.2.1. General Table Setting Techniques

The preliminary setting up of a new table of the Title Block, as well as usual tables, is carried out using the new table creation dialog (Fig. 10.3). The dialog appears on the screen after clicking button **Add...** in the Title Block creation dialog (Fig. 10.2).

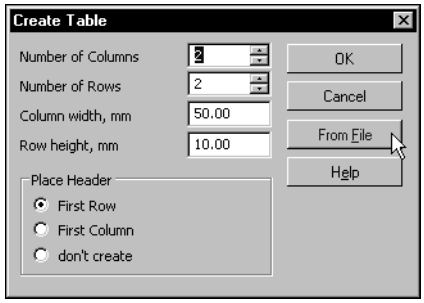


Fig. 10.3. Dialog for creating a new table

If the table for the Title Block was prepared in advance (see Section 10.3.1 on p. 134), click button **From File** and open the required table or fragment file.

If the table was not prepared in advance, set its parameters and click **OK**.

The system will go into the table editing mode: a new window with the table of set parameters will appear on the screen. Main Menu, Compact Panel and Property Bar will display in this mode the commands to work with tables.

When creating tables of the Title Block, all options of working with tables in KOMPAS-3D documents, which are described in Volume 2 of *KOMPAS-3D User Manual*, will be available. These options allow to adjust **General Settings** of the Title Block table. In addition, each cell of this table should necessarily have a **Special Setting** — an advanced format setting (see Section 10.2.2). This option is not available when creating usual tables.

When adjusting general settings of the Title Block table, the following information should be taken into consideration.

1. BOM style development is described in the BOM design module Manual.

- An automatic ban to edit the text will be set for each table cell containing any text. In other words, the presence of even one symbol in the cell means that it will be impossible to edit the text in this cell when filling in the Title Block in the document. The User will be able neither to delete the existing text, nor to supplement it, nor to change its parameters (font, color, size, etc.).
- The appearance of the text, which will be entered into an empty cell when filling in the document Title Block, is determined by the formatting applied to this cell during creation of the Title Block table. To set the cell format place cursor into this cell and click command **Format — Cell Format...** In the appeared dialog, you can set various parameters: text style, text offsets from cell borders, etc.

  Note that the text style can have advanced style settings — info about the required line spacing, symbol size and spacing in the text depending on the number of lines in this text (see Section 9.1.3 on p. 110).

  If the custom style should be applied to the text in a cell, it is recommended to save the style directly in the Title Block to be created — this will exclude style loss when moving the library to another work station. Text style creation in the Title Block is analogous to text style creation in the document (see Section6.2.2 on p. 74).
- Once the cell dimensions and text offsets are determined, it is recommended to fix the table dimensions. To do this, call command **Table — Table Fixing** and enable all options in the appeared dialog.
- If the Title Block table to be created is located on the sheet in such a way that some of its borders coincide with the document internal border (or with the borders of other tables), it is recommended to select the following line style for these borders:*Hidden*.

  It is due to the fact that some vector-type output devices process an even number of lines imposed on each other as 'no line'. As a result, some lines of the Layout will be absent in the printed document.

All in all, the cells of the created Title Block table should either **have the text**, or **have certain format and advanced format settings**, i.e., the settings determining the properties of the text to be entered into the cell when filling in the Title Block.

10.2.2. Cell Advanced Format Setting

Advanced Cell Format is a package of the Title Block cell properties, determining which service functions will be available when filling in the corresponding column of the Title Block in the document (automatic input of some data types, data transfer from one cell to other cells, calling of user menu, etc.). In addition, the cells properties specified during advanced format setting up determine the possibility and order of data transfer from one Title Block to another one when changing the document Layout.

The cell advanced format is set up in the dialog box having the same name (Fig. 10.4). It is called by clicking button **Next...** in the cell format setup dialog, or by clicking button **Advanced Cell Format** on panel **Tables and Borders** or on page **Tables** of Property Bar.

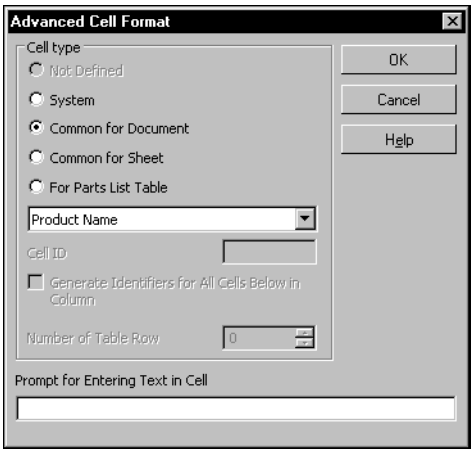


Fig. 10.4. Advanced Cell Format Settings dialog

When creating the Title Block table, the advanced format should be set up for each cell, which will be filled in by User during the work with the document. To do this, place cursor successively into empty cells of the table, call the cell advanced format dialog and set necessary properties of the current cell (where the cursor is placed) in this dialog.

Each empty cell of the Title Block is characterized by the following properties:

- **Type**,
- **ID**,
- **ID number**.

If the advanced format setting of the current cell has not been defined yet, its type is considered to be unspecified, and, as a consequence, at the first calling of the dialog the option **Not Defined** will be enabled in it. The cell type can not be left unspecified as otherwise the data input into this cell when filling in the Title Block will be impossible..

Available variants **System**, **Common for Document**, **Common for Sheet** and **For BOM Table** of group **Cell Type** allow to select the data type of the current cell.

Cell type descriptions and identifier assigning rules are given in Table 10.1.

Tab. 10.1. Cell types of the Title Block table

Type	Cell Description	Example
System	A cell of this type is filled in automatically (without User participation) in the document Title Block. Select the required identifier from the list to define which data is to be entered into a cell of system type.	Columns *Sheet number* and *Number of sheets* of main table in text documents and BOM's.

Tab. 10.1. Cell types of the Title Block table

Type	Cell Description	Example
Common for Document	The data entered into a cell of this type, when filling in the Title Block, can be automatically transferred into other cells of the Title Block tables on the same sheet and on other sheets of a multisheet document. **To transfer** data it is required that cell types and identifiers coincide. When changing the document Layout, the data from this cell is transferred into the cells of a "new" Title Block, which have the same type and identifier. Accordingly, type **Common for Document** should be set up and the same identifier should be selected for the cells of all Title Blocks, between which the data should be transferred automatically.	Column *Designation* of the main table, where the document designation is recorded. The text can be entered on any sheet of the document and this text will be automatically entered into *Column 26* of the same sheet and analogous columns of all other sheets in case of a multisheet document.
Common for Sheet	The data entered into a cell of this type, when filling in the Title Block, can be automatically transferred into a cell of another table of the Title Block on the same sheet. **To transfer** data it is required that cell types and identifiers coincide. When changing the document Layout, the data from this cell is transferred into the cells of a "new" Title Block, which have the same type and identifier. The content of this cell is **not transferred** into all sheets of a multisheet document.	Column *Revision* of the main table, where the document revision number is recorded. When changing one type of the Title Block of this document for another type, the column content will be automatically transferred into an analogous column with the same identifier.

Tab. 10.1. Cell types of the Title Block table

Type	Cell Description	Example
For BOM Table	This type is intended for BOM table cells (the Layout containing the Title Block with such table is included then into the BOM style*). When setting this cell type it is required to select the following identifiers from the list:**Ref. No.**, **Name**, **Designation**, **Number**, etc.) and specify the number of BOM table row, where the cell to be set up is located. All cells of the same column should have the same identifiers and differ only by the row number. Use option **Generate Identifiers for All Cells below in Column** to speed up the setup process for column cells of the same type (assigning identifiers and row numbers to them).	

* BOM style development is described in the BOM design module Manual.

It is necessary to set value for the identifier number in field **Cell ID** for cell type **Common for Sheet**.

Identifiers of cells of all other types should be selected from the drop-down list (Table 10.2 and 10.3). The numbers of these identifiers are predefined and field **Cell ID** will be inaccessible for data input.

Identifier **Custom** is one of the predefined identifiers. The peculiarities of its use are described in Section*Peculiarities of Using Cells of Types Common for Sheet and Common for Document* на с. 131.

Tab. 10.2. Identifiers of System Type Cells

ID	Identifier Number
Sheet number	7
Number of Pages	8
Format	Defined automatically by system
File Name (with Path)	43
File Name (Proper)	44
Designation line and Hyphen	45
Custom	

Tab. 10.3. Identifiers of 'Common for Document' Type Cells

ID	Identifier Number
"Product Name|1|"	1
Document Designation	2
Material designation	3
Document letter (Column 1)	40
Document letter (Column 2)	41
Document letter (Column 3)	42
Mass of Product	5
Scale	6
Manufacturer's code	9
Name of Resp. Eng.	110
Dev. finish date	130
Name of Check. Person	111
Checking date	131
Name of Mfg. Eng.	112
Process inspection date	132
Work type	10
Name of Draw. Person	113
Drawing date	133
Name of Qual. Eng.	114
Qual. insp. date	134
Name of Appr. Person	115
Approval date	135
Designation of Variant [Main Variant]	2110
Designation of Variant [Var.1]	2111
Designation of Variant [Var.2]	2112
Designation of Variant [Var.3]	2113
Designation of Variant [Var.4]	2114

Tab. 10.3. Identifiers of 'Common for Document' Type Cells

ID	Identifier Number
Designation of Variant [Var.5]	2115
Designation of Variant [Var.6]	2116
Designation of Variant [Var.7]	2117
Designation of Variant [Var.8]	2118
Designation of Variant [Var.9]	2119
Document Number	Not used
Document Name	51
Document Code	52
OKP Code	53
Custom	

Identifier numbers are displayed in the Message line in the Title Block table editing mode.

The text can be also entered in the cell advanced format setting dialog, this text will be displayed in KOMPAS-3D message line when filling in this cell of the Title Block (when cursor will be inside the cell). This text should be entered into field **Prompt for Entering Text in Cell**.

The prompt line should explain to the maximum extent the purpose of the current cell, as it will serve as the only system tip when entering the text into this cell.

If it is required that the User Menu will be available when entering the text into this cell, then symbol "|" (vertical line) followed by the Section number of the User Menu file, the rows of which should be displayed in the Title Block column to be filled in when calling out this menu, should be entered directly after the prompt text.

Text input into the Title Block columns by selecting the required rows from the User Menu speeds up the fill-in process and excludes misprints, which can occur while typing. The purpose of User Menu file, its structure and syntax are described in detail in Chapter 12

Peculiarities of Using Cells of Types Common for Sheet and Common for Document

The using of types **Common for Document** and **Common for Sheet** on one and the same sheet gives the same results - the data entered into the cells of this type can be transferred (provided that identifiers coincide) into the cells of other tables on the same sheet. However, type **Common for Document** is more universal as it provides also the data copying between the sheets in a multisheet document. Because any of the Title Blocks can be used for multisheet documents, it is recommended to adhere to the following rules.

- The cells containing the data, which are unique for this sheet, should have type **Common for Sheet**. If, among these cells, there are some cells, in which the data should be the same, then assign to them the same identifiers ; this will ensure the automatic fill-in of other cells on this sheet upon filling in of any such cell.
- The cells containing the data, which are unique for this document, e.g., its designation, part name, manufacturer's identification), should have type **Common for Document**. If, among these cells, there are some cells,in which the data should be the same, then assign to them the same identifiers ; this will ensure the automatic fill-in of other cells on sheet(s) upon filling in of any such cell.
- The cells, which are to be filled in by hand after the document is printed out, e.g., cells for signatures), can have either type **Common for Sheet**, or **Common for Document**. The only thing to check in this case is that no data is transferred to these cells from other cells. For a cell of type **Common for Sheet** it is achieved by assigning of a unique numeric identifier, and for a cell of type **Common for Document** — by assigning of identifier **Custom** with a unique value.

Use of Custom Identifiers

So, when setting up the cell advanced format it is required to define the cell type and its identifier. If there is no required identifier among the predefined , i.e., included into the list , ones, select variant **Custom** from the list.

In this case it is required to set value of the custom identifier to specify the cells, between which the data should be transferred. This value (integer number) is entered into field **Cell ID**, which becomes available upon selection of the custom identifier.

The values of custom identifiers assigned to the cells of different purpose should be necessarily different!

E.g., it is required to transfer data between the cells having custom identifiers and located in the Title Blocks of sheets in a multisheet document. For this purpose, it is necessary to assign type **Common for Document** to all these cells and set the same identifier values.

At the change of the document Layout the data transfer is possible between the cells having custom identifiers. A condition for such data transfer is a coincidence of types and identifier values of the cells of a previous Title Block and a new one.

Care should be exercised to see that the custom identifiers assigned to analogous cells have the same values, and it is required only when creating the Layouts, which can be interchanged with a high probability.

To avoid an accidental coincidence of an identifier assigned by User with an identifier already existing in the system (it is clear that it will lead to "mixture" of data in the cells) it is recommended to use identifiers specified in Table 10.4.

Tab. 10.4. Recommended Identifiers (Values of Custom Identifiers)

Range	Cell Type
1000–2000, 2500–16383	**Common for Sheet**, **Common for Document** (Identifier **Custom**)
100–150	**For BOM**

Identifier Control

When creating the Title Block table it is possible to check its cells for available identifiers and for their coincidence.

Call command **Service — Identifier Check** to carry out such check.

The identifier control dialog will appear on the screen. The current Title Block table is displayed in this dialog. Those cells of the table, the types and identifiers of which coincide, are highlighted with blue color, and those cells, the type (and identifier correspondingly) of which is not defined — highlighted with pink.

The presence of cells without identifiers or with the same identifiers is a gross mistake in the Title Block table creation. Therefore, if such cells were found, it is required to set their advanced format repeatedly.

10.2.3. Setting of Table Position on Sheet

To set the Title Block table position on sheet, select it in list **Components of Title Block** of the Title Block creation dialog. This Title Block will become the current one, i.e., its name will be displayed in field **Table Name**, and its image will be highlighted in window **Print Review**. The elements located in group **Snap** control the table position on sheet. These elements are described in Table 10.5.

Tab. 10.5. Elements of **Snap** Group

Element	Description
Base Point on Sheet	The list allowing to define, which characteristic point of the document internal border will be used as a base point for the current table snapping. This point is displayed in window **Print Preview** in the form of a small square.
Base Point of Table	The list allowing to define, which characteristic point of the table will be used as a base point for snapping.
Move Horizontally, **Move Vertically**	Fields to input the table base point offsets relating to the base point on sheet.

Tab. 10.5. Elements of **Snap** Group

Element	Description
Table Rotate	A group of elements determining the value and direction of the table rotation around its base point. The rotation value is set up by selecting the required row from list **Rotation angle**. The list includes the angle values divisible by 90°. In case the table location depends on a sheet format and orientation, e.g., Table *Column 26* of the Title Block, it is necessary to enable option **Relative to Longer Side**.

10.3. Advanced Methods of Title Block Creation

Some steps of the Title Block creation can be sufficiently expedited using such methods as table preliminary preparation and prototype use.

10.3.1. Preliminary Preparation of Tables

Prior to creation of a unique Title Block (with no existing prototype) it is possible to form preliminary all tables, which will constitute the Title Block, and save them in separate files on the hard disk.

The preparation of table files is not obligatory. The table creation is possible during the Title Block formation.

Carry out the following steps to create a table file.

1. Create a graphic or text document in KOMPAS-3D.
2. Create a table in this document, arrange it and set the required format for its cells.
3. When in the table editing mode, call command **File — Save Table to File...**
4. Select a folder and enter a file name to save the table in the appeared dialog box. The default extension of table files in KOMPAS-3D — *tbl*.

If the table of created Title Block practically has no areas with regular structure, it is more reasonable to pre-draw it in a fragment of KOMPAS-3D (**.frw*).

10.3.2. Use of Title Block Prototypes

If some Title Blocks already exist in the current library, you can use any of them as a prototype for a newly created Title Block. To do this, prior to clicking button **Create Style** in the Title Block use dialog, select the required Title Block in the list (Fig. 10.5).

Reply “Yes” on a system question about using the selected Title Block as a prototype (Fig. 10.6).

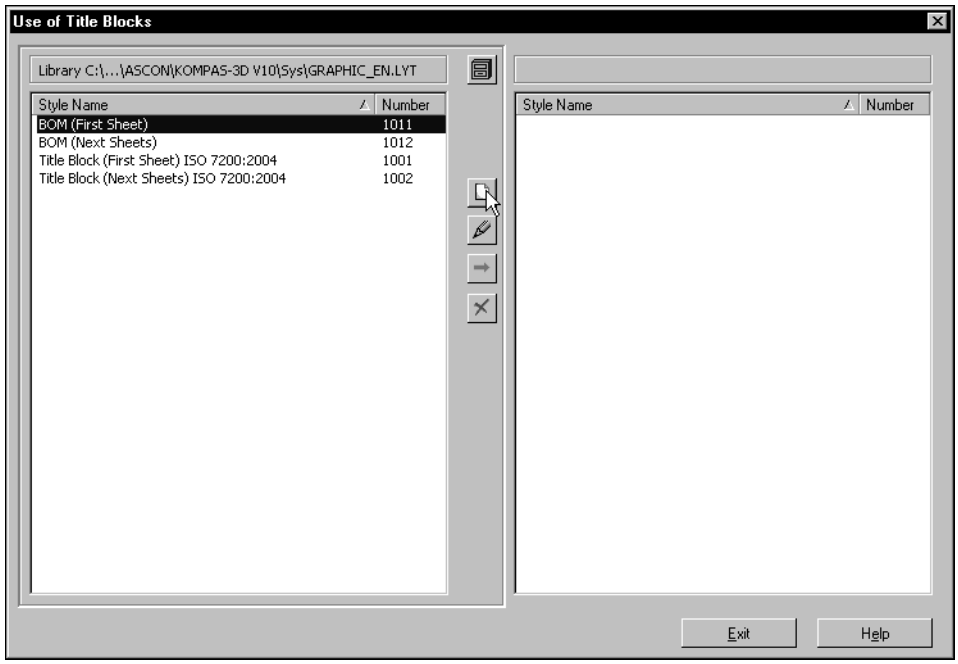


Fig. 10.5. Selection of Prototype Title Block

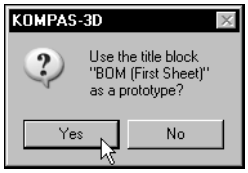


Fig. 10.6. Prototype Use Confirmation

In this case the Title Block creation dialog will display the list of the prototype Title Block tables (Fig. 10.7) and you will be able to develop a new Title Block editing these tables and their location. Table deletion and addition of new ones is also possible.

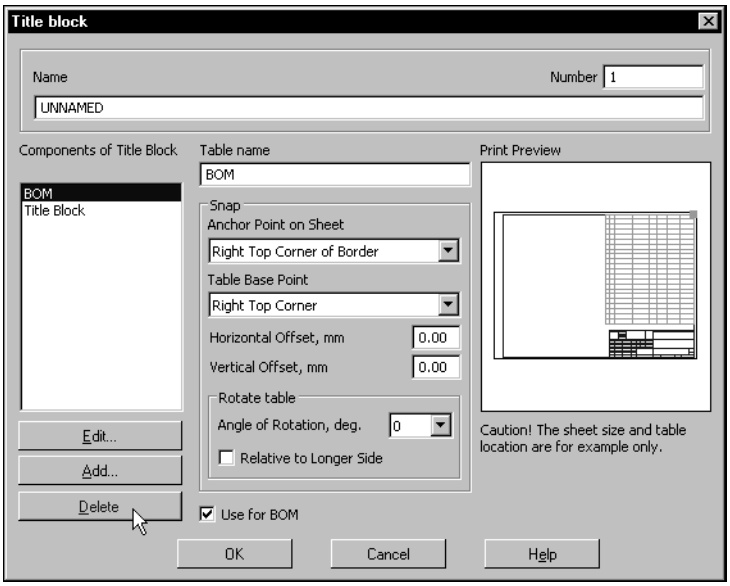


Fig. 10.7. Prototype Title Block Editing

To edit the table selected from the list click button **Edit...**, and to delete it — button **Delete**.

The Title Block created using a prototype is not different from the Title Blocks created without it.

In a similar way Layouts can be created based on a prototype.

10.4. Layout Creation

After setting up the Title Block, which will be included into a new document Layout, it is possible to proceed to creation of the Layout itself.

The general procedure to create a new Layout is as follows.

1. Call command **Service — Style Libraries — Drawing Layout...** or command **Service — Style Libraries — Layout of Text Documents...** depending on the type of a document, for which this Layout is created.
2. In the appeared Layout Use dialog box open library **.lyt*, which contains the Title Block to be used in the created Layout.

The Title Blocks stored in a current library **.lyt* are **not displayed** in the Layout Use dialog. To open the required library, you should know its file name. E.g., it can be memorized or recorded when creating the Layout.

3. Click the button **Create Style** to proceed to creation of a new Layout in the current library.
4. Set up the properties of a new Layout in the appeared dialog (see Section 10.4.1). Close the Layout Setup dialog by clicking button **OK**. The system will return to the library use dialog. The name of a newly created Layout will appear in the list of Layouts of the current library.
5. Close the Layout Library use dialog.

10.4.1. Layout Setting

Drawing and text document Layout setting up is carried out in the dialogs with the same names.

The dialogs to set up drawing Layouts (Fig. 10.8) and text document Layouts (Fig. 10.9) differ from each other partially. The elements common for both dialogs are presented in Table 10.6.

Tab. 10.6. Common Control Elements of Document Layout Setup dialogs

Element	Description
Name	A field for layout number input. Usually, the name includes brief information about the Layout purpose.
Number	A field for layout number input. The Layout numbering rules are given in Section 10.1.2 on p. 122.
External Border	An option controlling the presence of an external border limiting the format in the Layout. Select the required row from list **Line** to define the line style for external border drawing. The current style line appearance is displayed in a preview window to the right from the list.
Internal Border	An option controlling the presence of the internal border in the Layout. Select the required row from list **Line** to define the line style for external border drawing. The current style line appearance is displayed in a preview window to the right from the list. Enter the required values into the fields of group **Clearance to External Border** to set the distance between the corresponding sides of the external and internal borders.
Normal Block	An option controlling the presence of the Title Block tables in the Layout. The name of a Title Block used in the Layout to be set up is displayed in the field located under this option. Click button **Select** located to the right from the filed to change the Title Block. A dialog containing the list of the Title Blocks included into a current library **.lyt* will appear on the screen.

It is more convenient to select the Title Block if its name coincide with the name of the Layout to be set up , e.g., like in library *Graphic_EN.lyt*.

The drawing Layout Setup dialog additionally includes the group of elements **Revision Table**. These elements are presented in Table 10.7.

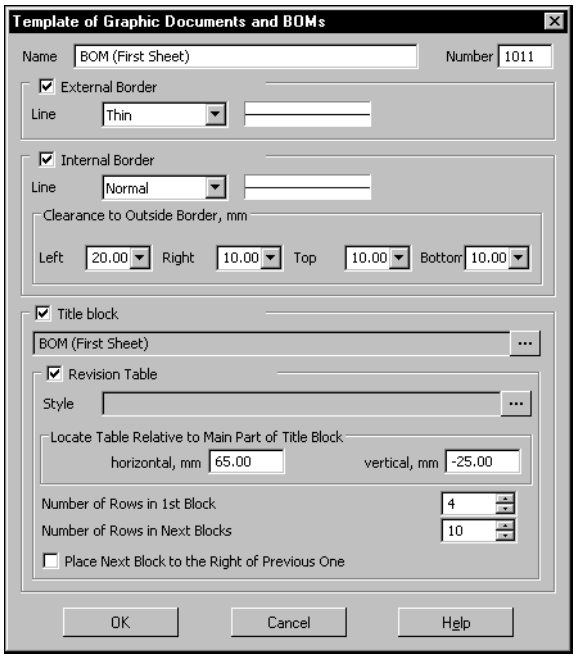


Fig. 10.8. Drawing Layout Setup dialog

Tab. 10.7. Group of Elements **Revision Table**

Element	Description
Revision Table	An option controlling the presence of the Revision Table in the Layout as a separate table not being a part of the Title Block. Such Revision Table is developed using BOM design module*, i.e., it is actually a specifically set up BOM table.
Style	A field, where the Revision Table style, used in the Layout to be set up, is displayed. Click button **Select** located to the right from the filed to change the Revision Table style. A dialog containing the list of the BOM styles included into a current library **.lyt* will appear on the screen. Here it is necessary to select a style corresponding to the Revision Table, which will be used in the Layout to be set up**. Two styles developed for the Revision Table are supplied with KOMPAS-3D system: *Revision table. GOST 2.104-2006* and *Revision table with zones. GOST 2.104-2006*. They are stored in library *Graphic.lyt.*
Table Offset relative to Main Table of Title Block	Fields to input an offset of the Revision Table lower-right angle in relation to the Title Block main table upper-left angle (the first table in the list of the Title Block tables is considered to be the main, see Fig. 10.2 on p. 124).

Tab. 10.7. Group of Elements **Revision Table**

Element	Description
Number of Rows in 1st Block	A field to input the number revision records in the first block of the table. E.g., the number of rows in the first block of the table should not exceed 4, so that the Revision Table does not go beyond the Title Block table limits on the first sheet of a design drawing.
Number of Rows in Next Blocks	A field to input the number of revision records in the subsequent blocks of the table. E.g., the number of rows in the subsequent blocks of Revision Table should be equal to 10 for the subsequent blocks of Revision Table to be equal by height to the Title Block table on the first sheet of a design drawing.
Place Next Block to the Right of Previous One	An option, which enabling specifies that a subsequent revision block will be placed to the right of the previous one. If this option is not enabled, the subsequent revision blocks will be placed to the left of the previous ones.

* BOM style development is described in the BOM design module Manual.

** You can work with the revision table in the document using this layout if the work with BOM is enabled.

The text document Layout Setup dialog (Fig. 10.9) additionally includes the group of elements **Text Fields**. The distances between the internal border sides and the corresponding input field boundaries can be defined in this group of elements. From face

Offset and text 1-st line indent values are measured from the input filed boundary (see Fig. 9.2 on p. 108).

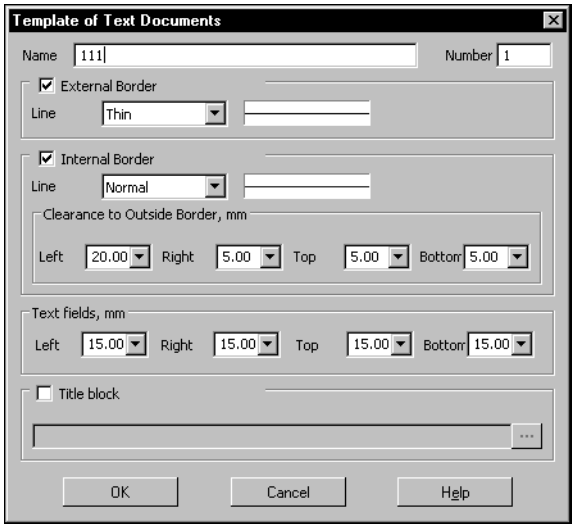


Fig. 10.9. Text Document Layout Setup dialog

10.5. Text Document Layout Peculiarities

To select a Layout for the sheets of the current text document call command **Service — Options... — Current Text Document — Sheet Parameters**.

You can specify the Layouts for the first and subsequent (even and uneven) sheets by selecting item **Layout** in the left part of the appeared dialog (Fig. 10.10).

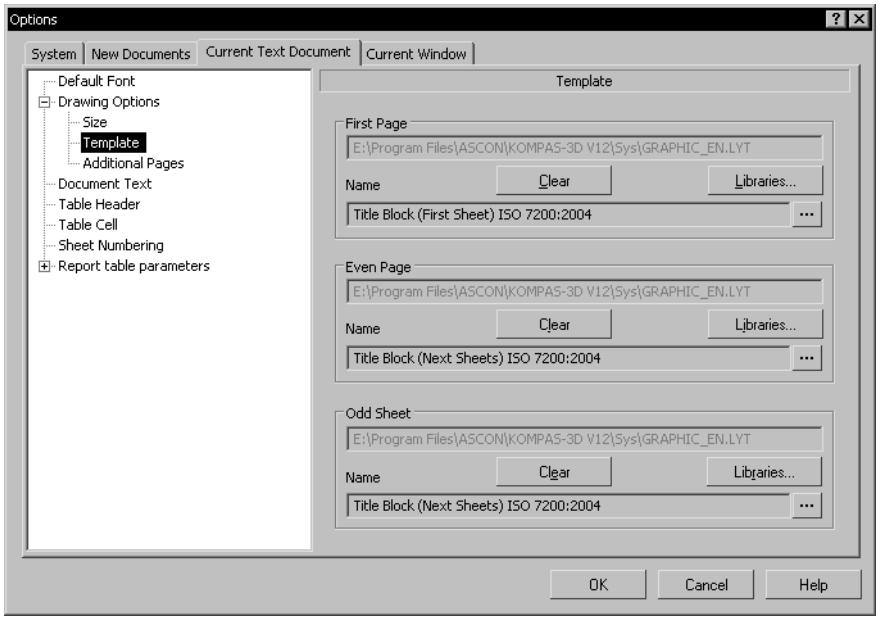


Fig. 10.10. Layout Selection Dialog for Text Document Sheets

You can specify the Layouts for additional at the beginning and at the end of a document, as well as their order, by selecting item **Additional Sheets** (Fig. 10.11).

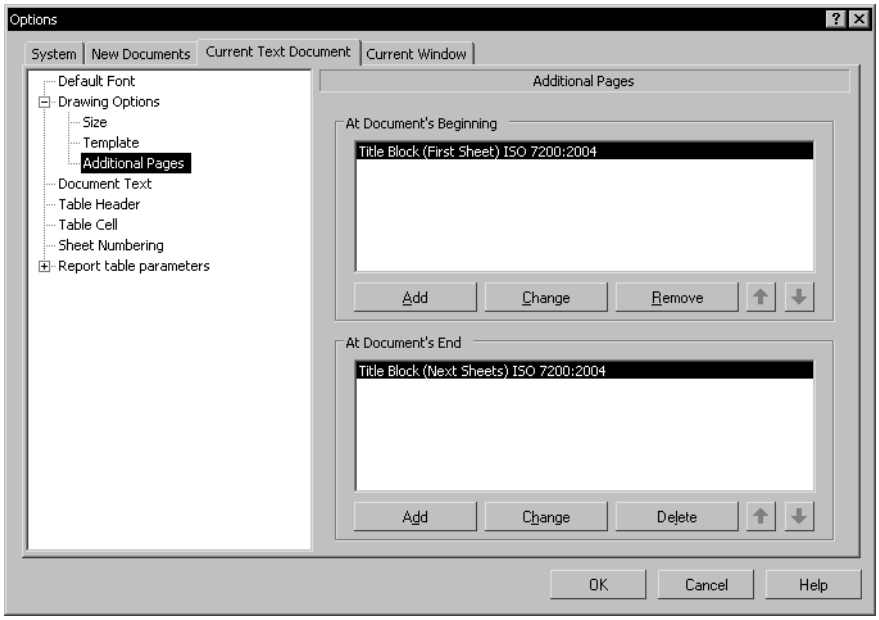


Fig. 10.11. Layout Selection dialog for Text Document Additional Sheets

The number of sheets is determined by the number of selected Layouts.

If you use the same Layouts for the most part of text documents, then the setting described above for each document is irrational. In this case it is possible to arrange so that all new documents will be created already with the required Layouts, i.e. to set the required Layouts as default.

To do this, call command **Service — Options... — New Documents — Text Document — Sheet Parameters**. You can set up the Layouts for all sheets of new (future) text documents the same way as for the current one by selecting items **Layout & Additional Sheets** in the left part of the dialog.

10.6. Document Templates

KOMPAS-documents Template is the document blank containing several typical settings. Template files have the following extensions:

- Drawing Template—*cdt*,
- Fragment Template—*frt*,
- Text Document Template—*kdt*,
- BOM Template—*spt*,
- Part Template—*m3t*,
- Assembly Template—*a3t*.

The Template is selected when creating a document (Fig. 10.12).

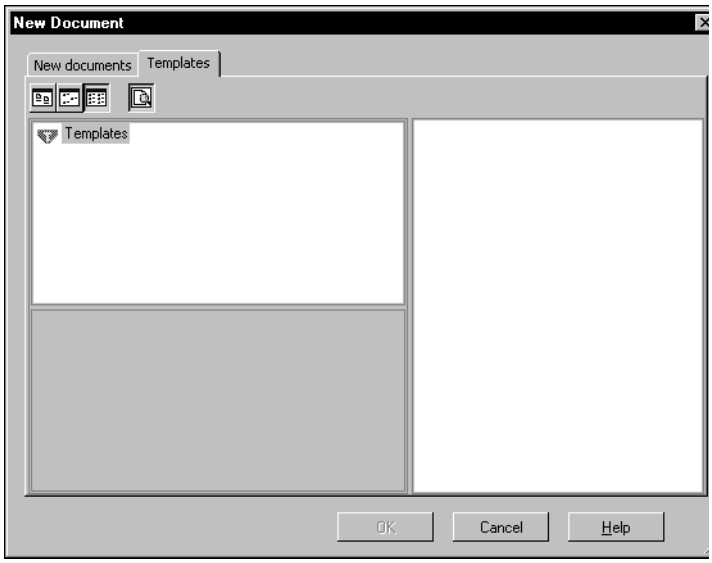


Fig. 10.12. Drawing Creation Using Template

Thanks to the use of Templates the process of preparation and setting up of new typical documents is expedited and unified.

The KOMPAS-3D package includes several Templates for drawings, text documents, BOM's and parts. The Templates are stored in subfolder *\Templates* of the main system folder.

User can edit the existing Templates and create the own ones for documents of any type.

The following steps should be carried out to make a Template.

1. Create a document of the required type.
2. Arrange and set it up as required.
3. Save the document by selecting row **Template** in list **Type** of the save dialog file.

The following settings and objects can be recommended to store in a Template:

- Format,
- Layout,
- (, , , .),
- Title BlockObject settings (dimensions, leaders, etc.)
- System text styles settings
- Property settings, part and assembly display accuracy.

When working with a document created using a Template, User can change any of the parameters stored in the Template.

Chapter 11.
Layout Creation Practice

This Chapter includes some exercises, which will allow you to acquire the basic skills of work with the drawing and text document Layouts. Prior to proceeding to the exercises it is recommended to study carefully theoretic information described in the previous Chapter.

11.1. Techniques of Operation with Layout Libraries

The exercises to set up the Title Blocks and Layouts are recommended to be performed in a separate library created specially for training.

Exercise 17. Layout Library Creation. Test

Задание Create layout library user_forms.lyt.

1. Call command **Service — Style Libraries — Drawing Layout...**
2. Create a layout library with the name user_forms in a similar way as you created a line style library in Exercise 1 on p. 86.

   Proceed to the next exercise without closing the Layout Use dialog.

Exercise 18. Layout Copying between Libraries

Задание Copy the following system Layouts into library user_forms.lyt: **Design drawing. First Sheet. GOST 2.104-2006** and **Design drawing. Next sheets. GOST 2.104-2006** from the Graphic.lyt library.

1. Activate the adjacent (to the left) preview window in the Layout Use dialog by clicking the mouse button.

2. Click button **Show Library**.
3. Open folder *\Sys* in the appeared dialog, select file *Graphic.lyt* and click button **Open**.

   The list of Layouts stored in the selected library will appear in the preview window to the left.
4. Select the following Layouts in the list: *Design drawing. First Sheet. GOST 2.104-2006* and *Design drawing. Next sheets. GOST 2.104–2006*. To do this, select them simultaneously pressing the button <*Ctrl*>.

5. Click button **Copy**.

   The selected Layouts will appear in a window to the right : the list of Layouts stored in library *user_forms.lyt*. These Layouts will be used to create custom Layouts when performing Exercises 22 and 23.
6. Close the drawing Layout Use dialog by clicking button **Exit**.

   While copying layouts *Design drawing. First Sheet. GOST 2.104-2006* and *Design drawing. Next sheets. GOST 2.104-2006* to library *user_forms.lyt* the Title Blocks used in these Layouts were also copied.
7. In order to check is, click command **Service — Style Libraries — Types of Title Block...**.

   The Title Block Use dialog will appear on the screen. Note that the content of the same libraries as in the Layout Use dialog is displayed in preview windows of this dialog.

8. Make sure that the preview window of library *user_forms.lyt* displays two Title Blocks *Design drawing. First Sheet. GOST 2.104-2006* and *Design drawing. Next sheets. GOST 2.104-2006*.

   These Title Blocks will be used to create custom Title Blocks when performing Exercises 20 and 21.

9. Close the Title Block Use dialog by clicking button **Exit**.

11.2. Drawing Layouts

This Section includes the exercises allowing to acquire skills of the Title Block and Layout creation. The use of creation methods is shown by the example of Layout creation for the first and next drawing sheets containing casting elements. In accordance with *Attachment 2 to GOST 3.1125–88* these drawings should have an additional Title Block (Fig. 11.1, 11.2). The purpose of the additional Title Block columns is described in Table 11.1.

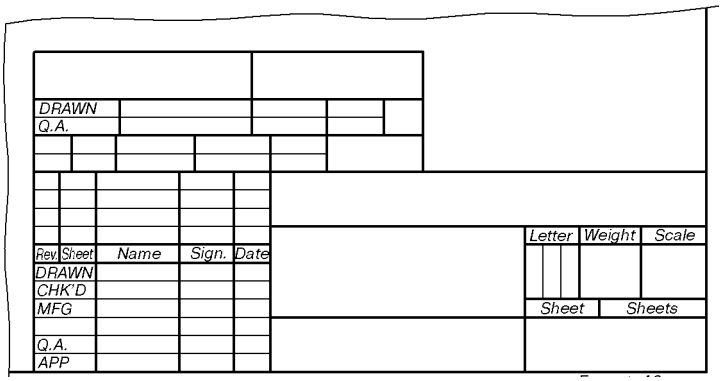


Fig. 11.1. Additional Title Block Location on Sheet

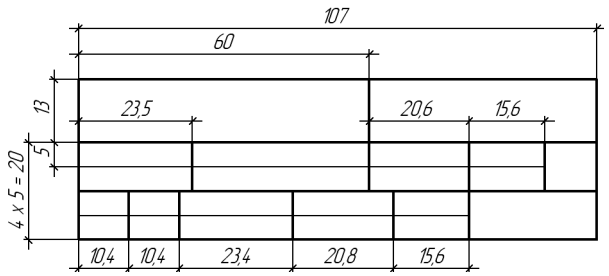


Fig. 11.2. Additional Title Block Structure and Dimensions

Tab. 11.1. Purpose of Additional Title Block Columns for Drawings Containing Casting Elements

Column number	Purpose
1	Casting code (or designation)
2	Document designation as per GOST 3.1201–85.
3	Casting Resp. Eng.

Tab. 11.1. Purpose of Additional Title Block Columns for Drawings Containing Casting Elements

Column number	Purpose
4	Name of Casting Resp. Eng.
5	Signature of Casting Resp. Eng.
6	Signature date.
7	Qual. Eng.
8	Name of Qual. Eng.
9	Signature of Qual. Eng.
10	Document revision number.
11	Mark about notice list supersedence and introduction as per GOST 2.503-90.
12	Notice designation (code).
13	Signature of person resp. for revision.
14	Spare.

11.2.1. Title Blocks

Exercise 19. Table Image Creation in Fragment

1. Create a new fragment.
2. Using system line styles *Normal* and *Thin* draw a table in this fragment following the dimensions specified on Fig. 11.2.

   As it can be seen from Fig. 11.1, the lower border of additional Title Block coincides with the upper border of the drawing main table. Therefore, do not draw the line limiting the Title Block from below.
3. Save the created fragment under the name *stamp.frw* and close it.

Exercise 20. Title Block for First Sheet

1. Call command **Service — Style libraries — Types of Title Blocks...**The dialog for working with attribute types will appear on the screen.

   The Title Block Use dialog will appear on the screen. If library *user_forms.lyt* is closed, open it using button **Show Library**.

   When making test exersice, we copied to library 18*user_forms.lyt* the layouts *Design Drawing. First Sheet. GOST 2.104-2006* and *Design drawing. Next sheets. GOST 2.104-2006*. As you remember, the corresponding Title blocks were also copied automatically. Their names are displayed in the current preview window.

2. Select Title Block Text *Design Drawing. First Sheet. GOST 2.104-2006* and click the button **Edit**.

   The Title Block creation and editing dialog displaying parameters of the selected Title Block will appear on the screen. These parameters should be edited.

3. Enter value *101* into field **Number**.
4. Enter the following to the field **Name**: *Drawing with casting elements. First Sheet. GOST 3.1125–88*.
5. Press button **Add...**.
6. Click button **From File** in the appeared table creation dialog box and select from menu command **Create from Fragment**.
7. Select file*stamp.frw*, which contains the table image, in the appeared file opening dialog.
8. Click button **OK** in the appeared table creation parameters dialog.
9. The table, the image of which was stored in the selected fragment, will appear in KOMPAS-3D window (Fig. 11.3).

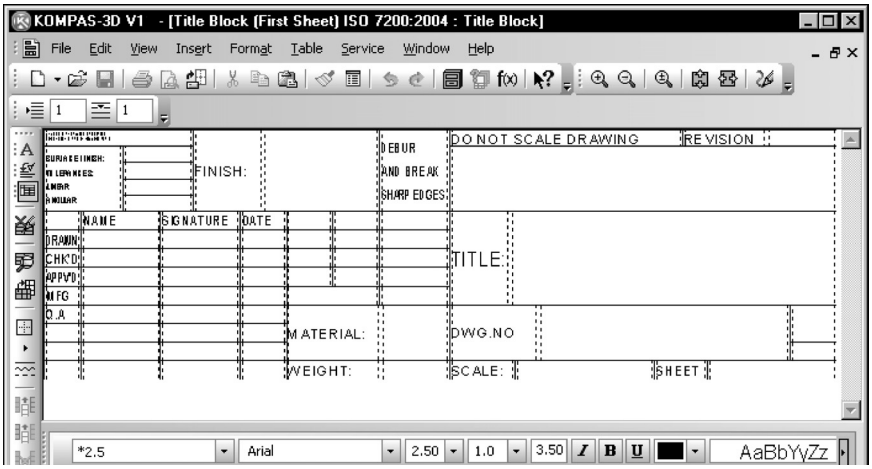


Fig. 11.3. KOMPAS-3D Window in mode of new title block creation

As this fragment did not include the line limiting the Title Block from below, then style *Hidden* was automatically selected for lower border lines of the corresponding table cells. By default, hidden lines are not displayed on the screen. To display them click button **Show Grid** on page **Table** of the Property Bar.

The text input boundaries are shown with dashed line inside the cells. Distances from input area boundaries to the corresponding cell boundaries are text **Offsets**. The following offset values are used by default:

- left 0.5 mm
- right 0.5 mm
- top 0 mm
- bottom 0 mm

10. Set top and bottom offsets equal to 0.5 mm for columns 1, 2 and 14.
    10.1. Place the cursor into the required cell and call command **Format — Cell Format**.
    10.2. Enter value *0.5* in fields **Top** and **Bottom** of the appeared dialog box.
    10.3. Left unchanged the other offset values of these and other cells.
11. Call command **Table — Table Fixing**.

12. Enable all options in the appeared dialog box and close it.
13. Set text style *Default* to all columns, except for columns 1, 2, 3, 7 and 14, and enable option to enter only one text line to each of them.
    13.1. Place the cursor into the required cell and call command **Format — Cell Format**.
    13.2. Enable option **Single-line Text** in the appeared dialog box.

    Owing to this setting the line break will be ignored in these columns when filling in the additional Title Block. The string length will be fitted to the column width automatically increasing text symbol compression.

    13.3. Click button **Change...**
    13.4. Activate the **Embedded** tab in the displayed dialog.
    13.5. Select style *Default* from the list on this page and click button **Select**.

    The name of the selected style will appear in field **Default Text Style** of the cell format setup dialog.

    13.6. Close the cell format setup dialog.

    How did text styles *Default*, *Letter-Mass-Scale*, *Designation*, *Name* and *Material-Company*, the names of which are displayed in the current text style selection dialog, appear in a new table of the Title Block?

    They were created and saved in Title Block *Design Drawing. First Sheet. GOST 2.104-2006*, which was used as the basis for a new Title Block.

    Text style creation in the Title Block is possible when creating or editing any table of this Title Block. Text styles created in the Title Block are available in any of its tables, but not only in that one, for which they were created.

    You just checked it by assigning style *Default* to the cells of a newly created table. This style will be applied to the texts entered to these cells when filling in the additional Title Block of a document.
14. Assign text style *Default* to columns 3, 7 and 14.

    It is not necessary to set a ban for line break in these columns. Columns 3 and 7 will contain text and as a consequence they will not be available to users. Column 14 — a spare one, so a possibility of multiple line input should be left for it.
15. Set left alignment for all columns, except for columns 1 and 2.
16. Enter text *Name of Resp. Eng.* into column 3, and text Name of *Qual.Eng.*into column 7.

    Text input and edit will be impossible in these columns while filling in the additional Title Block.
17. Assign style *Designation* to columns 1 and 2.

    This style has the advanced style setting — a setting determining line spacing and symbol size and spacing in the text depending on the number of lines in it.
    17.1. Call command **Service — Style Libraries — Text Styles** to see this advanced style setting.

    17.2. Click button **Show document** in the appeared dialog box.
    17.3. Activate the **Embedded** tab in the active preview window. The list of text styles available in the current Title Block (the Title Block, which includes the table to be edited) is displayed on this page.

17.4. Select style *Designation* from the list.

17.5. Click button **Edit**.

17.6. In the appearing dialog, click the **Next...** button.

The text advanced style setup dialog will appear on the screen (Fig. 11.4).

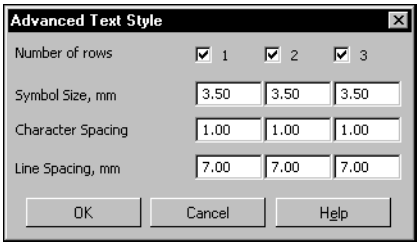


Fig. 11.4. Text Advanced Style Setup Dialog

The settings in this dialog determine the following rules of text location in the cell:

- if the text consists of one line, then symbol size will be 7 mm; line spacing is of no importance in this case,
- if the text consists of two lines, then they will be located with spacing 7 mm; symbol size is 5 mm.

17.7. Without changing the settings close the dialogs of text advanced style setup, text style edit and use of style library sets.

General cell setting up — determining of text appearance in the cells — is finished. Now, it is necessary to set up the advanced format — determine service functions available when filling in the additional Title Block columns in a document, as well as the possibility and order of data transfer from one additional Title Block to another one when changing the document Layout.

The advanced format should be set up for each empty cell, i.e., for all cells, excluding cells 3 and 7. To do this, it is necessary to place cursor in the required cells, call advanced format setup dialog (Fig. 11.5) and set the required properties.

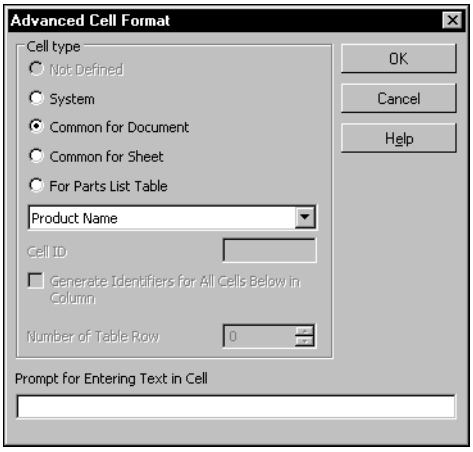


Fig. 11.5. Advanced Cell Format Settings dialog

18. Advanced Cell Format Settings dialog. To do this, click button **Advanced Cell Format** on toolbar **Tables and Borders**.
19. Set up the advanced cell format in accordance with Table 11.2.

Tab. 11.2. Advanced Cell Format Setup

№ Column No.	Cell Type	Cell Identifier	Value **(for identifier Custom)**
1	Common for Document	Custom	1000
2	Common for Document	Custom	1001
4	Common for Document	Custom	1002
5	Common for Sheet	1003	
6	Common for Document	Custom	1004
8	Common for Document	Name of Qual. Eng.	
9	Common for Sheet	1005	
6A	Common for Document	Qual. insp. date	

20. Set type **Common for Sheet** for all other cells and assign to them identifiers from 1006 to 1017.
21. Enter information about the column purposes from Table 11.1 on p. 144 as **Prompt for Entering Text in Cell**.

    So, e.g., *Casting code or designation* will serve as a prompt for the first column, and *Document designation as per GOST 3.1201–85* for the second column, etc.
22. Enter vertical line and number 4099 after the prompt text when setting up the columns for date input (6, 6a, 6b and 6c): |4099.

    Owing to this fact, the double mouse click in these columns will call in future (when filling in the additional Title Block) the date selection dialog.

    Why should the table cell advanced format be set up in this particular way?

- None of the cells contains the data, which could be determined by the system independently, so none of the cells has type **System**.
- In just the same way none of the cells is intended for BOM object input, so type **For BOM Table** is not used either.
- Following the rules given in Sections *Peculiarities of Using Cells of Types Common for Sheet and Common for Document* на с. 131 and *Use of Custom Identifiers* на с. 132, the cells of a created table should be set up as follows.
  - Casting code and document designation is information, which should be the same on all sheets of a multisheet document, so type **Common for document** is selected for columns 1 and 2. Identifier **Custom** is selected for these cells as there is no system identifier for them. Identifier values are set in accordance with Table 10.4 on p. 133.

- Name of Resp. Eng. of the casting drawing is the same on all sheets of a multisheet drawing. The same can be said about the Name of Qual. Eng. That's why type **Common for Document** is selected for columns 4 and 8.
- System identifier **Name of Resp. Eng.** can not be assigned to column *Casting Resp. Eng.* as usually a casting drawing responsible engineer and a part drawing responsible engineer (whose name is specified in the Title Block main table) are two different persons. It would have led to transferring the Name of Resp. Eng. from the Title Block to this column. Therefore, the custom identifier is assigned to column 4.
- Contrary to the responsible engineers, the quality engineer for a casting and part drawing can be one and the same person, so the following system identifier is assigned to column 8:**Name of Qual.** Therefore, the name entered into column *Name of Qual.Eng.* while filling in the Title Block will be automatically transferred to column *Name of Qual.*
- Columns 5, 9, 13 and 13a are provided for signatures, therefore they have type **Common for Sheet** and unique numeric identifiers.
- Columns 6 and 6a are provided for dates of document signing by the casting responsible engineer and the quality engineer. These columns are set up analogous to columns 4 and 8: both of them have type **Common for Document**, but Custom identifier is assigned to column 6 and System identifier is assigned to column 6A (**Qual. Insp. Date**).

If quality engineers, which check part drawings and casting drawings, are different, then columns 8 and 6a should be set up analogous to columns 4 and 6.

- Columns 10, 10a, 11, 11a, 12 and 12a include the data unique for this sheet, therefore they have type — **Common for Sheet**.

23. Call command **Service — Identifier Check**.

    The dialog with the current table image will appear on the screen. Displaying of any table cells in blue or pink color denotes correspondingly the absence or the coincidence of identifiers of these cells.

24. Provided that such cells are present in the table, check and change their settings.
25. Call the **File — Save Table** command.

    The created table and its settings will be recorded into Title Block *Drawing with casting elements. First Sheet. GOST 3.1125–88*.

26. Now save table to file. This file will be used when creating the Title Block for next sheets of drawings with casting views.

    26.1. Call the **File — Save Table to File...** command.

    26.2. Select a folder to save the table file in the appeared dialog box. Enter *stamp* into field **File Name** and click button **Save**.

    File *stamp.tbl* containing structure and Layout of this table, format and advanced format of its cells will be created in the specified folder.

27. Call the **File — Finish Editing Table** command.

Table editing window will be closed. The Title Block creation dialog will appear again on the screen.

A newly created table will be placed to the end of list **Components of Title Block** and will be called "UNNAMED". Its image will be highlighted with green in window **Print Preview**.

28. Select this new table in the list and enter *Additional* into field **Table Name**.
29. Locate this new table on sheet in such a way that its lower left corner coincides with the upper left corner of the Main Table.
    29.1. Select line **Right Bottom Corner of Border** from list **Base Point on Sheet**.
    29.2. Select line **Left Bottom Corner of Border** from list **Table Base Point**.
    29.3. Enter value *185* into field **Horizontal Offset**.
    29.4. Enter value *55* into field **Vertical Offset**.
    29.5. Enter value *0* into field **Rotation Angle**.
30. Do not enable options **Relative to longer side** and **Use for BOM**.
31. At that the process of creation of Title Block *Drawing with casting elements. First Sheet. GOST 3.1125–88* is finished. Click the **OK** button.

    The Title Block creation dialog will be closed. The Title Block Use dialog will appear on the screen. It contains Title Blocks *Design drawing. Next sheets. GOST 2.104-2006* and *Drawing with casting elements. First Sheet. GOST 3.1125–88*.

Exercise 21. Title Block for the Next Sheets

The creation process of the Title Block for next sheets does not include the step of table setting up, as the table for this Title Block is ready already — it is stored in file *stamp.tbl*. Other steps are analogous to those of the Title Block creation for the first sheet, so their detailed description is omitted.

1. Select Title Block *Design drawing. Next sheets. GOST 2.104-2006* and click the button **Edit**.

   The Title Block creation and editing dialog shall appear on the screen.
2. Enter *102* in the field **Number**.
3. In the field **Name** enter *Drawing with casting elements. Next sheets. GOST 3.1125–88*.
4. Press button **Add...**.
5. In the displayed table creation dialog, click button **From File** and select from menu the command **Load from Table File...**
6. In the appeared file opening dialog, select file *stamp.tbl*, which contains the table created and set up when performing the previous Exercise.

   The selected table will appear in KOMPAS-3D window.
7. Make sure that the table retained its structure and layout and its cells retained their texts, format and advanced format settings.
8. Call the **File — Save Table** command.
9. Repeat items 28–30 from the previous exercise by setting the vertical offset to 15 mm.
10. At that the process of creation of Title Block *Drawing with casting elements. Next sheets. GOST 3.1125–88* is finished. Click the **OK** button.

The Title Block creation dialog will be closed. The Title Block Use dialog will appear on the screen. Now it includes the following Title Blocks: *Drawing with casting elements. First Sheet. GOST 3.1125–88* and *Drawing with castings elements. Next sheets. GOST 3.1125–88*.

11. Close the Title Block Use dialog.

11.2.2. Templates

Exercise 22. First Sheet Layout

1. Call command **Service — Style Libraries — Drawing Layout...**

   The Layout Use dialog will appear on the screen. The list of Layouts stored in library *user_forms.lyt* is displayed in one of its windows: *Design drawing. First Sheet. GOST 2.104-2006* and *Design drawing. Next sheets. GOST 2.104-2006*.

2. If this is not the case, click button **Show Library** and open file *user_forms.lyt.*

3. Select Layout *Design drawing. First Sheet. GOST 2.104-2006* and click button **Edit**.

   The document Layout Setup dialog will appear on the screen.

4. Enter the following to the field **Name**: *Drawing with castings elements. First Sheet. GOST 3.1125–88*.
5. Enter *101* in the field **Number**.
6. Click button **Select** in group **Title Block**.
7. Select the following line in the appeared Title Block Selection dialog: *Drawing with castings elements. First Sheet. GOST 3.1125–88* and click the button **OK**.

   The Title Block Selection dialog will be closed. The Layout Setup dialog will remain on the screen.

8. Close the Layout Setup dialog without changing other parameters by clicking **OK**.

   The Layout Use dialog will remain on the screen. Instead of Layout *Design drawing. First Sheet. GOST 2.104-2006* the following Layout will appear in its active preview window: *Drawing with castings elements. First Sheet. GOST 3.1125–88*.

Exercise 23. Layout of Next Sheets

1. Select Layout *Design drawing. Next sheets. GOST 2.104-2006* and press the **Edit** button.

   The document Layout Setup dialog will appear on the screen.

2. In the field **Name** enter *Drawing with casting elements. Next sheets. GOST 3.1125–88*.
3. Enter *102* in the field **Number**.
4. Select Title Block *Drawing with castings elements. Next sheets. GOST 3.1125–88*.
5. Do not change other parameters.
6. Click the **OK** button.
7. Close the Layout setting dialog.

11.2.3. Layout Correctness Check

It is necessary to check the Layout setting correctness immediately after their creation. Having found an error, correct it immediately because edition of the Layouts already assigned to documents is a very long and laborious work.

Exercise 24. Check of Created Layouts

1. Create a new drawing in KOMPAS-3D.

   The following default Layout is assigned to the first sheet of a new drawing *Design drawing. First Sheet. GOST 2.104-2006* from library *Graphic.lyt*.

2. Assign to this sheet the Layout *Drawing with castings elements. First Sheet. GOST 3.1125–88* from library *user_forms.lyt*.

   2.1. Call command **Service — Document manager**.

   2.2. Look at the **Tree of sheets, views and layers** (it is located in the left part of dialog **Document manager**) and select object **Sheets** in it.

   The line corresponding to a single sheet will appear in the right part of the dialog — in the **List of Sheets, Views and Layers** . **List of Sheets, Views and Layers** is a table with object properties displayed in its columns. Any property can be changed directly in **Document Manager**.

   2.3. Select the line corresponding to the drawing first sheet by a mouse click.

   2.4. Click on the last cell of the line — a cell located in column **Layout Library**.

   The sheet Layout Selection dialog will appear on the screen.

   2.5. Click button **Libraries...** in it.

   2.6. Select file *user_forms.lyt* in the appeared file opening dialog and click button **Open**.

   The file opening dialog will be closed. The Layout Style Selection dialog will appear on the screen.

   2.7. Select line *Drawing with casting elements. First Sheet. GOST 3.1125–88*.

   2.8. Close the Style Selection dialog and then the Layout Selection dialog by clicking **OK** button.

   2.9. Click button **Apply** in dialog **Document Manager**.

   You will see that the drawing sheet image has changed on the screen: now it includes the additional Title Block. Move window **Document Manager** sideways not closing it for convenient view.

3. Add a new sheet to the drawing and assign the Layout *Drawing with castings elements. Next sheets. GOST 3.1125–88*. These operations are executed via **Document manager**.

   3.1. Chose a convenient screen position for the **Document manager** to facilitate your work.

   3.2. Click button **Create Sheet** on the toolbar of **Document Manager**.

   The line corresponding to the added sheet shall appear in the **List of Sheets, Views and Layers**. The newly added sheet has the following default layout: *Design drawing. Next sheets. GOST 2.104-2006* from library *Graphic.lyt*.

   3.3. Assign it the following layout: *Drawing with castings elements. Next sheets. GOST 3.1125–88* from library *user_forms.lyt*. To do this, complete steps described in paragraphs 2.3–2.8.

4. Click **OK** to close the **Document Manager** dialog.

5. Check correct setup of the additional Title Block table.

   5.1. Click on the Title Block of the first sheet to enter this Block edit mode.

5.2. Set cursor to column 1 — the upper left cell of the table.

5.3. Make sure that the Message line displays message "Casting Code or Designation".

5.4. Enter several symbols to the cell. Make sure that height of the symbols is not more than 7 mm.

5.5. Press the *<Enter> key* to create another line in the same cell, and enter the text of this line. Make sure that height of the symbols is 5 mm.

5.6. Double mouse click on any of the columns provided for date input (6, 6a, 6b or 6c). Make sure that the Date Selection dialog appeared on the screen.

5.7. Fill in all columns of the additional Title Block with the arbitrary data, except for the columns provided for signatures (5, 9, 13 and 13a).

Make sure that arbitrary number of lines can be entered into column 14 and only one line —into all other columns.

Make sure that style *Default* is applied to the entered text.

5.8. Exit from the Title Block edit mode by pressing key combination *<Ctrl> + <Enter>*.

Make sure that:

- the data entered into columns *Casting code or designation* and *Document designation as per GOST 3.1201–85* (1 and 2) have been transferred to the corresponding cells of the additional Title Block on the second sheet;
- the data entered into columns *Name of Casting Resp. Eng., Name of Qual.Eng*., *Resp. Eng. signature Date*, *Qual. Eng. Signature Date* (4, 8, 6 and 6a) have been transferred to the corresponding cells of the additional Title Block on the second sheet;
- the data entered into columns *Name of Qual.Eng.* and *Qual. Eng. Signature Date* (8 and 6a) have also been transferred to the corresponding columns of the Title Block Main Table on the first sheet;
- the data about casting modifications have not been transferred anywhere.

6. Save your drawing.

7. Assign to the first sheet the following Layout: Drawing with castings elements. Next sheets. GOST 3.1125–88.

Make sure that all the data remained unchanged in the additional Title Block after the Layout change.

Actually, the following had happened when the Layout was changed. Title block tables included to the layouts *Drawing with castings elements. First Sheet. GOST 3.1125–88* and *Drawing with castings elements. Next Sheets. GOST 3.1125–88* have been checked for the presence of identical cells i. e. cells with identical types and IDs. Then, the data from cells of the previous Title Block were transferred into identical cells of a new Title Block.
In this case the identical cells were found owing to the use of the same table in Layouts.
If it is required to organize the data transfer between the cells of different tables included into different Title Blocks, it is necessary to set up these cells manually in such a way that their types and identifiers coincide.

11.3. Layout of Text Documents

This Section includes Exercises, which allow to get acquainted with some peculiarities of the text document Layouts.

Layout creation for text documents includes the same two main steps as for drawing Layout creation:

- Title Block creation,
- creation of the Layout containing the Title Block.

The process of text document Title Block creation is analogous to drawing Title Block creation.

The Layout creation using a ready Title Block is the subject of Exercise 25.

26 .

The Layout, the creation process of which is described in Exercise 25, already exists in library *Graphic.lyt*.

Exercise 25. Layout for Text Document

Create a Layout in library user_forms for the revision sheet in a text document. Use Title Block **Revision sheet (vertic.) Next sheets. GOST 2.503–90 FZ** from library Graphic.lyt.

1. Call command **Service — Style libraries — Types of Title Blocks...**

   The Title Block Use dialog will appear on the screen.

2. Using button **Show library**, open library *user_forms.lyt* in one window of the dialog and library *Graphic.lyt* in the other one.
3. Copy Title Block *Revision sheet. (vertic.) Next Sheets. GOST 2.503-90 F3* from library *Graphic.lyt* to *user_forms.lyt* and close the Title Block Use dialog.
4. Call command **Service — Style libraries — Layout of text documents...**

   The text document Layout Use dialog will appear on the screen.
5. Open library *user_forms.lyt* using button **Show library**.
6. Create Layout *Revision sheet (vertic.) Next sheets. GOST 2.503-90 F3.*

   6.1. Click button **Create style** in the text document Layout Use dialog.

   The text document Layout Setup dialog will appear on the screen.

   6.2. Enter the following to the **Name** field: *Revision sheet (vertic.) Next sheets. GOST 2.503-90 F3.*

   6.3. Enter *101* in the field **Number**.

   6.4. Enable option **Title Block**. A field with the Title Block name is located under it. For now this field is empty.

   6.5. Click button **Select** to the left from the field with the Title Block name.

   6.6. The Title Block Selection dialog will appear on the screen.

   6.7. Select the following Layout in this dialog: *Revision sheet. (vertic.) Next sheets. GOST 2.503-90 F3* and click the **OK** button.

The Title Block Selection dialog will be closed, and the name of the selected Title Block will appear in the text document Layout Setup dialog.

At that the Layout creation process is finished (Fig. 11.6).

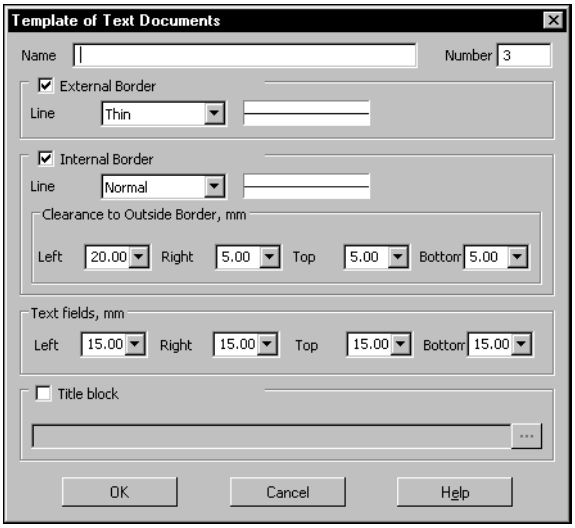


Fig. 11.6. Template Creation for Revision Sheet in Text Document

6.8. Close the dialog without changing other parameters by clicking **OK** button.

The text document Layout Use dialog will remain on the screen. The following newly created Layout will appear in the list of text document Layouts stored in library *user_forms.lyt*:*Revision sheet. (vertic.) Next sheets. GOST 2.503-90 F3.*

7. Close the text document Layout Use dialog.

Exercise 26. Inclusion of Additional Sheets into Text Document

Задание Create a text document with a cover sheet at the beginning and a revision sheet at the end of this document.

1. Create a new text document in KOMPAS-3D.

   The document is displayed in normal mode, i.e., without border and Title Block.

2. Fill in 2-3 pages of the document with any text.
3. Call command **View — Page Layout**.

   The document image will change: border and Title Block will appear on the screen. Make sure that the document does not include any additional sheets.

4. Create additional sheets in the current document.

   4.1. Call command **Service – Options... – Current Text Document – Sheet Options – Additional Sheets**.

   The additional sheets Setup dialog for the current text document will appear on the screen.

   4.2. Click button **Add** in group **At Document's Beginning**. The Layout Selection dialog will appear on the screen.

4.3. Click button with three dots to the right from list **Name**.

The Layout Style Selection dialog will appear on the screen.

4.4. Select line **Cover sheet. GOST 2.105–95**.

4.5. Close the Layout Style Selection dialog and then the dialog **Layout** by clicking **OK** button.

The additional sheets etup dialog will remain on the screen. The name of the selected layout — **Cover Sheet will appear in the list of additional sheets At Document Beginning**. GOST 2.105-95.

4.6. In a similar way add Layout at the end of the document a sheet with Layout **Revision sheet (vertic.) Next sheets. GOST 2.503–90 F3**, which was created when performing the previous Exercise.

4.7. At that the setup process for additional sheets of the current text document is finished. Close the dialog by clicking the **OK** button.

5. Make sure that a cover sheet appeared at the beginning of the document (before its first sheet) and revision sheet — at the end (after its last sheet).

Text input on these sheets is carried out in the Title Block editing mode.

6. Make sure that both additional sheets are included into automatic sheet numbering and automatic total sheet number determination, i.e., actually, the first additional sheet at the beginning should become the first sheet of the document and the last additional sheet at the end should become the last sheet of the document.

Part IV

Service Text Files

Chapter 12.
User Menu File

User menu file describes menus containing commands for insertion of text fragments to various texts. This file is named *Graphic.pmn* and located in subfolder *\Sys* of KOMPAS-3D Main Folder.

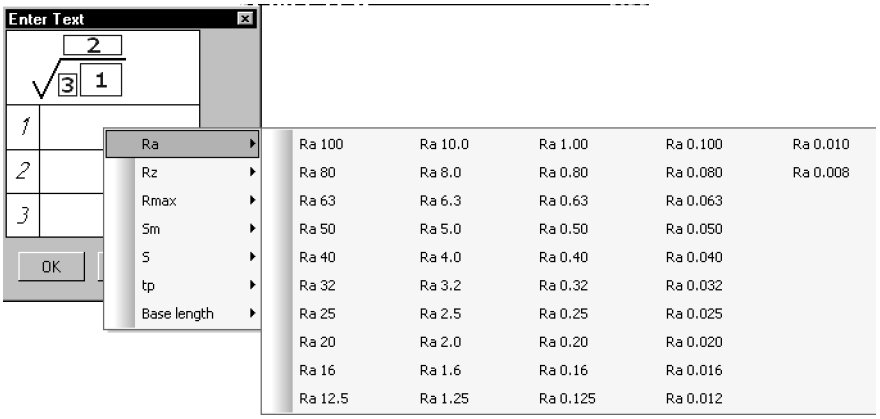


Fig. 12.1. User menu for text input in Roughness Symbol

Examples of menus described in the file *Graphic.pmn* are the menus called by double-clicking the left mouse button in the following cases:

- working with dialog for entering special character text (Fig. 12.1), geometric tolerance, etc.
- filling the Document Title Block (Fig. 12.2).

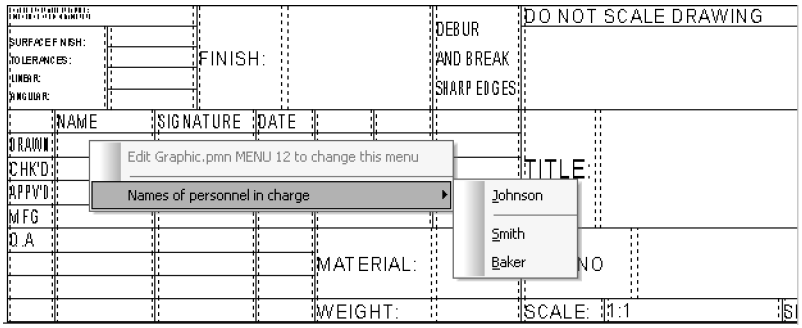


Fig. 12.2. User menu for filling the Drawing Title Block

Graphic.pmn is a text file that can be directly edited by the user.

By editing this file, the user can, for instance, customize the pop-up menu for filling the Title Block to include necessary names and initials of officials, complement the scale list, etc.

The user can also create new sections in *Graphic.pmn* file that describes menus available when entering a text into columns of original (user) Title Blocks (see Section 10.2.2 on p. 126).

If the KOMPAS System was been executing during *Graphics.pmn* file editing, then changes to the file will be available after KOMPAS system is restarted.

12.1. File Structure

The file is comprised of sections. You can insert your own sections into the file. It is recommended to number them from 1001 to 4000.

Section numbers 1-1000 are reserved for ASCON. Please do not use them, otherwise your custom menus may conflict with new versions of *Graphic.pmn* file included to the system distribution package.

12.2. File Syntax

The User Menu File allows to build an hierarchic menu structure. It is comprised of individual lines. A line may describe a section or a menu command. Lines may be commented. Comments are not displayed on the screen or inserted to the document. Comment is a string preceded by **'** (apostrophe) symbol. E.g., in the line **MENU 2 'Surface finish parameter** the comment is **Surface finish parameter**.

Each section of the file has a header **MENU num** where **num** is the section number.

A file section must begin with the keyword **BEGIN** and end with the keyword **END**. Lines located between those keywords (inside the section) will be displayed in the User Menu.

A section lists menu items (separate commands) and submenus (names of command groups) nested in this section. Submenus, in their turn, may also contain menu items and submenus.

A menu item has the following syntax:

MENUITEM "name" FLAGS, where

name is menu name,

FLAGS is flag combination (see Table 12.4 on p. 166).

A nested menu section , i.e., a submenu , has the following syntax:

POPUP "name", where

name is submenu name (which appears in the menu).

Similar to the parent menu, a submenu should begin with the keyword **BEGIN**, end with the keyword **END** and contain menu items (MENUITEM) and nested submenus (POPUP).

The syntax of **name** in a menu item or a submenu is as follows:

name = name1|name2, where

name1 is a substring that will appear in the menu, i.e., command

name2 is a substring that will be inserted into the text when the command is selected.

If **name** consists of a single substring (of the form **name = name**), then this substring will appear in the menu and will be inserted into the text.

The substring **name1** may contain the control symbol &. The following symbol will be underlined and serve as shortcut key. A shortcut key allows to execute the command from the keyboard by pressing the appropriate key. The menu that contains this command should be

displayed thereat on the screen. E.g., the file *Graphic.pmn* contains the string **MENUITEM "&Polish|Polish"**. In the User Menu, it will appear as **Polish**, and the P letter will serve as a shortcut key, i.e., after calling the menu containing the **Polish** command, for calling this command, it will be sufficient to press the *<P>* key on the keyboard.

The substring **name2** may contain various control symbols that define the configuration of a string inserted into the text. Various types of structures containing those control symbols and description of each structure are given below.

1. Insert Indices

   The structure **$XX;YY$** allows to insert subscripts and superscripts in the document.

   A substring entered after the first symbol **$**, will be inserted to the document as a superscript. If the first symbol **$** is followed by the symbol **;** then a substring after the symbol will be inserted in the document as a subscript. The next symbol **$** ends the sub/superscript. If the symbol **;** is missing or it is separated from the ending **$** by an empty row, then only a superscript will be inserted. If the starting **$** and **;** are separated by an empty row, then only a subscript will be inserted.

   The menu item **AA$XX;YY$BB** will be inserted to the document as

   AA $^{\mathbf{XX}}_{\mathbf{YY}}$ **BB**

   A menu item may contain several sub/superscripts. In this case the symbol **$** that starts the sub/superscript must be separated from the symbol **$** that ends the previous sub/superscript by at least one symbol. If a menu item contains the **$$** sequence, then a single symbol **$** will be inserted in the document.

   The symbols **s**, **m**, and **l** allow to change the size of sub/superscript symbols. They must follow the control symbol **$**. Size-controlling symbols are active for the entire sub/superscript. Text will be small-sized after **s**, medium-sized after **m** , and full-sized after **l** . By default, a sub/superscript text is full-sized.

   An example of entering a sub/superscript and changing its size is provided in Table 12.1.

Tab. 12.1. Insertion of sub/superscripts into a document; changing size of a sub/superscript

Menu Item	Displayed Menu Command	String Inserted to Document	Index Height
MENUITEM "L min cubed|L$3;min$"	**L min cubed**	$\mathbf{L^{3}_{min}}$	full
MENUITEM "L min cubed|L$l3;min$"			
MENUITEM "L min cubed|L$s3;min$"	**L min cubed**	$\mathbf{L^{3}_{min}}$	small

2. Inserting Fractions

   The structure **$bXX;YY$** or **$dXX;YY$** allows to insert a fraction in the document.

   A substring entered after the symbol **$b** or **$d**, will be inserted to the document as a fraction numerator. If the symbol **$b** (**$d**) is followed by the symbol **;**, then a substring after that symbol will be inserted to the document as a denominator of the fraction. The next symbol **$** ends the fraction. If the symbol **;** is missing or it is separated from the

ending **$** by an empty row, then the fraction will have only a numerator. If the symbol **$b** (**$d**) is separated from the symbol **;** by an empty row, then the fraction will have only a denominator.

The menu item **AA$dXX;YY$BB** or **AA$bXX;YY$BB** will be inserted to the document as

AA $\frac{XX}{YY}$ **BB**

The symbols **s**, **m**, and **l** allow to change the size of fraction symbols. They must follow the control symbol **$b** (**$d**). Size-controlling symbols are active for the entire fraction. Text will be small-sized after **s**, medium-sized after **m** , and full-sized after **l** . By default, fraction symbols are full-sized.

An example of entering fractions and changing their size is provided in Table 12.2.

Tab. 12.2. Insertion of fractions into a document; changing size of a fraction.

Menu Item	Displayed Menu Command	String Inserted to Document	Fraction Height
MENUITEM "Clearance fit H7/h6|$bH7;h6$" **MENUITEM "Clearance fit H7/h6|$blH7;h6$"**	**Clearance fit H7/h6**	$\frac{H7}{h6}$	full
MENUITEM "Clearance fit H7/h6|$bmH7;h6$"	**Clearance fit H7/h6**	$\frac{H7}{h6}$	small

A menu item may contain several fractions.

3. Insertion of Special Characters and Symbols

To insert special characters and symbols into structures, use the **~** (twiddle) symbol. It serves as a sign of the end of a special character number or a symbol code.

3.1. Insertion of KOMPAS System Special Characters

@+XXXXX~BB

A string of type
<Special Character No. XXX from the file Graphic.sss> BBwill be inserted into the text.

Numbers, images and names of KOMPAS-3D special characters are provided in the Appendix.

E.g., the file *Graphic.pmn* contains the string
MENUITEM "2 holes with diameter 20|2 holes @+2~20".

In the User Menu, it appears as
2 holes with diameter 20.

When it is selected, the following string will be inserted in the text:

2 holes Ø20

Thus, the structure **@+2** in the file *Graphic.pmn* substitutes the diameter symbol.

Special characters Nos. 78–80, 83, 9399–99, 171, 172 contain text (e.g., No. 80 contains framed text). This text, in turn, may contain other special characters.

All symbols in the substring **name2** that follow the number of any special character that contains text are considered as composing the text of this special character (including control symbols).

E.g., the file *Graphic.pmn* contains the string
MENUITEM "Root of one third|@+98~$b1;3$".

In the User Menu, it appears as
Root of one third.

When it is selected, the following string will be inserted in the text:

$$\sqrt{\frac{1}{3}}$$

The largest permissible special character number is 65536.
If the number of a special character is greater than 65536, then the number shall be found as a remainder of the integer division of the specified number by 65536.

3.2. Insertion of Symbols from Fonts installed in the Operation System

^(FNAME)YXXXXX~BB

A string of type
<Symbol with code XXX from the font FNAME> BB will be inserted to the text

The **Y** symbol in the **YXXXXX** structure designates a modifier of code representation. The modifier shows the numeral system , hexadecimal or decimal, in which the symbol code is represented (table. 12.3).

Tab. 12.3. Modifiers of symbol code representation

Modifier	Numeral system	Notes	Example
*	Hexadecimal system	Maximum number of symbols is 4. The case of A, B, C, D, E, F characters is not relevant.	***221E**
+	Decimal system	Maximum number of symbols is 5. The largest code value is 65536; If the number of a special character is greater than 65536, then the number shall be found as a remainder of the integer division of the specified number by 65536.	**+61448**

Name of font style and codes of symbols may be determined, e.g., from standard Windows application **Character Map** (Fig. 12.3).

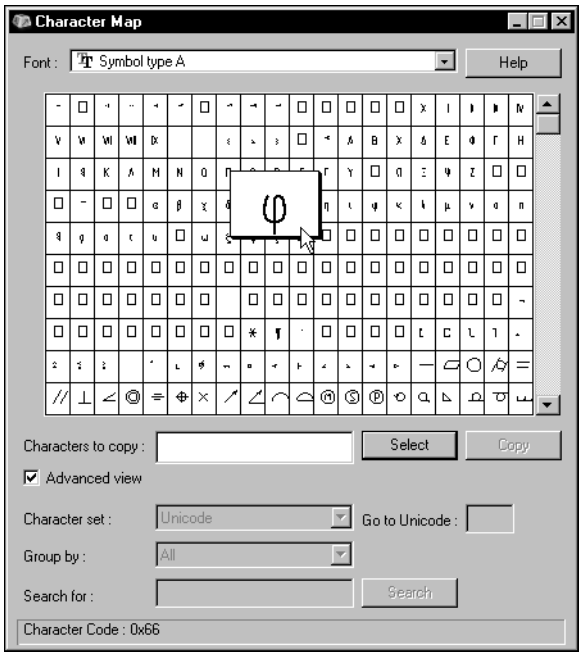


Fig. 12.3. **Character Map** application window

E.g., the file *Graphic.pmn* contains the string
MENUITEM "Drum revolutions at max. transformation|^(Symbol Type A)+121~$m*;3$".

In the User Menu, it appears as
Drum revolutions at max. transformation.

When it is selected, the following string will be inserted in the text:
Ψ^{*}_{3}

3.3. Insertion of Symbols from Current Font

^YXXXXX~BB

A string of type
AA <Symbol with code XXXXX from the current text font> BB will be inserted to the text

The **Y** symbol in the **YXXXXX** structure designates a modifier of code representation. The modifier shows the numeral system , hexadecimal or decimal, in which the symbol code is represented (see table12.3).

To determine a style and a code of a symbol, you can, for example, use the standard Windows application **Character Map** (see Fig. 12.3).

To insert the @, ^, ~, $, & symbols from the current font in the text, you can use the @@, ^^, ~~, $$, && structures respectively, instead of the **^YXXXXX~** structure.

Instead of basic structures for insertion of special characters and symbols i. e. **@YXXXXX~BB**, **^(FNAME)YXXXXX~BB** and **^YXXXXX~BB**, you can use additional structures: **&XX~BB**, **#(FNAME)XX~BB** and **#XX~BB** respectively. Differences between basic and additional structures are the follows:

- you can use only two characters (not five) for designation of a special character number or a symbol code,
- a modifier is not available in structures for insertion of symbols; a specified code is deemed to be decimal.

4. Insertion of a Line Break

   AA@/BB

   Two lines will be inserted to the text: **AA** and **BB**.

   E.g., the file *Graphic.pmn* contains the string
   MENUITEM "Block valve angular| Block valve@/angular".

   In the User Menu, it appears as
   Block valve angular.

   When it is selected, two strings will be inserted in the document:
   Block valve
   Angular

   Thus, the structure @/ in the file *Graphic.pmn* works as a line break sign.

If a table cell of the Title Block is configured for single-line text, then any line breaks will be ignored.

Tab. 12.4. Flags for MENUITEM

Flag	Purpose
SEPARATOR	Draws a horizontal separator line. Any text or flags are ignored.
MENUBREAK	Places the menu command in a new column.
DISABLED or **GRAYED**	The menu command is unavailable for selection and displayed as grayed.

Flags may be combined, separated by spaces or commas.

Fragment of the file *Graphic.pmn* is provided below as an example of structure and syntax of this file.

```
MENU 12
BEGIN
MENUITEM "User-configured menu (Graphic.pmn MENU 12)"  GRAYED
MENUITEM SEPARATOR
```

```
MENUITEM “I.V. &Nikolayeva      Vice President|Nikolayeva”
MENUITEM SEPARATOR
POPUP “Developers”
BEGIN
MENUITEM “P.P. &Polikarpov      Dept. Manager|Polikarpov”
MENUITEM SEPARATOR
MENUITEM “I.I. &Ivanov|Ivanov”
MENUITEM “P.P. P&etrov|Petrov”
MENUITEM “S.S. &Sidorov|Sidorov”
END
POPUP “Technologists”
BEGIN
MENUITEM “Yu.Yu. &Semenov      Dept. Manager|Semenov”
MENUITEM SEPARATOR
MENUITEM “A.B. &Dubinina|Dubinina”
MENUITEM “M.Ya. &Petrova|Petrova”
MENUITEM “I.I. P&olovinin|Polovinin”
END
POPUP “Quality Inspection”
BEGIN
MENUITEM “M.Yu. &Buyanov      Dept. Manager|Buyanov”
MENUITEM SEPARATOR
MENUITEM “P.P. &Polikarpov|Polikarpov”
MENUITEM “A.A. &Samokhvalov|Samokhvalov”
END
END
```

This section of the User Menu File describes the menu called when entering names of officials into fields of the Title Block (Fig. 12.2 on p. 160).

When editing the User Menu File, one should remember that some of its sections are used by the system for semi-automated text entry when setting dimensions and technologic symbols (for instance, a surface finish parameter value can be chosen from the User Menu). It is not recommended to edit those sections, as they contain standard texts and values.

Chapter 13.
Density Reference File

In MP calculations of revolved and extruded solids, you can select a value of density of material from the special reference file instead of entering it manually. The same file is used to select a material in the model properties setup.

Names of materials and their respective density values are stored in the file *Graphic.dns* located in subfolder *Sys* of KOMPAS-3D Main Folder.

Graphic.dns is a text file that can be directly edited by the user.

File sections begin and end with symbols «{» and «}» respectively. A section name must be on the same line as the opening brace. Sections can be nested. Spaces are not significant symbols and do not alter the appearance of strings in a reference dialog displayed on the screen.

Below is provided a fragment of the file *Graphic.dns* that describes the **Metals** section containing two subsections :**Aluminum Alloys** and **Bronzes**.

```
{ Metals
{ Aluminum Alloys
 AD, AD1= 2.71
 D1= 2.80
}
{ Bronzes
 Br.AZh9-4= 7.50
 Br.AZhMc10-3.5= 7.50
 Br.KMc3-1= 8.40
}
```

Chapter 14.
Codes and Names File

The nomenclature of engineering documents is established by GOST 2.102–68. According to the standard, each document type has its certain code and naming. In KOMPAS-3D, numbers and names of non-substantive engineering, operational, and repair documents and diagrams are retrieved from the file *Graphic.kds*.

The contents of this file define the following:

- the content of **Numbers and names** dialog displayed after selecting the command for number and name insertion,
- standard numbers and names used
  - when auto-filling the BOM Title Block,
  - when disabling the display of product name in an item of BOM,
  - when synchronizing the Title Block of a drawing and a model.

The file *Graphic.kds* cannot be edited in KOMPAS-3D. However, this is a text file and thus it can be opened and edited in any text editor, e.g., in Windows Notepad.

File sections begin and end with symbols «{» and «}» respectively. A section name must be on the same line as the opening brace. Sections can be nested. This allows to construct a tree-like structure of document types. Spaces are not significant symbols and do not alter the appearance of strings in a dialog.

Below is provided a fragment of the file *Graphic.kds* that describes the *Repair Documents* section of **Numbers and names** dialog (Fig. 14.1). This section contains the following subsections:

- **Major Repair**;
- **Medium repair**.

The example shows the correspondence between structure and contents of *Graphic.kds* file and those of the dialog.

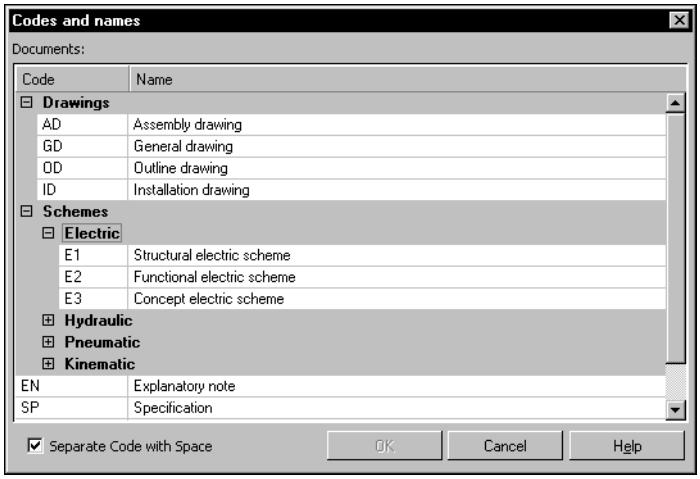


Fig. 14.1. **Numbers and Names** dialog; Repair Documents section

```
{Repair documents
 {Major Repair
   RK  =  Repair Manual
   UK  =  Repair Specifications
   ZK  =  Norms of spare parts usage  for repair
   MK  =  Norms of material usage for repair
   ZIK  =  Schedule of spare parts for repair
   VRK  =  Schedule of repair documents
 }
 {Medium repair
   RS  =  Repair Manual
   US  =  Repair Specifications
   ZS  =  Norms of spare parts usage  for repair
   MS  =  Norms of material usage for repair
   ZIS  =  Schedule of spare parts for repair
   VRS  =  Schedule of repair documents
}
```

The file *Graphic.kds* should be located in a folder with the path defined by the system variable *SYS*. By default, this is *\Sys* folder of KOMPAS-3D System.

The system checks the presence of the numbers and names file in the following cases:

- when calling the command for numbers and names insertion,
- when creating a BOM item in a drawing with Title Block filled in,
- when switching to the slave working mode with BOM items in a drawing with Title Block filled in,
- when opening a drawing with Title Block filled in and with BOM Table in drawing,
- when opening a BOM that contains at least one object and with Title Block filled in,
- when opening a BOM with the Title Block that is associated with a document attached to it.

The availability of the numbers and names file is checked once per working session, i.e., in one of the above list cases that occurs first.

If the file *Graphic.kds* is missing in the folder that was set as default, then the system displays the dialog shown in Figure 14.2.

Buttons of this dialog are described in the Table 14.1.

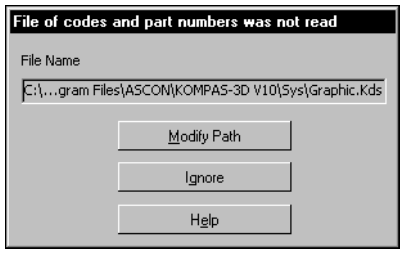


Fig. 14.2. Number and Name File Replacement Dialog

Tab. 14.1. Buttons of Numbers and Names file replacement dialog

Button	Function
Change Path	Searching for the numbers and names file on the disk. Upon pressing this button, the standard Windows Open File dialog will be displayed. You can select any file (also, with an extension other than **.kds*), whose structure matches that of a numbers and names' file. The selected file is used only for the current working session. After the next start, the system will again search for the file *Graphic.kds* in the system folder defined by the variable *SYS*.
Ignore	Abandon the use of the file *Graphic.kds* in the current working session. After pressing this button, automated entry and processing of numbers and names when working with a BOM will become unavailable until the end of the session.

Chapter 15.
Library Manager Configuration File

Library Manager configuration files contain the description of the Library Manager structure. Their file extension is *lms*. These files are used in the following cases:

- initial populating of the Library Manager,
- execution of **Update Library Manager** command.

Upon launching the Library manager or executing **Update Library Manager** command, the following actions will be performed.

- Analysis of the configuration file.
- Checking that library files listed in the configuration file are present in the folder *\Libs* of the KOMPAS System.
- Adding the files found to the Library Manager according to the specified structure.

If before the **Update Library Manager** command execution the Manager contains libraries not listed in the configuration file, they remain unchanged. If the Manager contains libraries listed in the configuration file, but with paths inconsistent with this file, then their location in the Manager will not change. Libraries are not added repeatedly.

The configuration file cannot be edited in KOMPAS-3D. However, this is a text file and thus it can be opened and edited in any text editor, e.g., in Windows Notepad.

There may be several configuration files. The Library Manager is populated using contents of all configuration files. User configuration files for the Library Manager should be assigned the extension *lms* and stored in the folder *\Sys* of the KOMPAS System.

Every line of the file contains a description of an attached library and includes the following parts:

- Path to the library in the Manager,
- Name of the Library File,
- Comment.

Parts of the file line are preceded by the following designations:

- */d*- path to the library in the Manager, path elements are separated by vertical bar |,
- */f*- Name of the Library File,
- */c*- comment.

Below is provided a fragment of the file *Graphic.lms* included to the KOMPAS-3D distribution kit.

/d-Sample Libraries|Symbols/f-Graphic.lfr/c-Design Elements Library

/d-Sample Libraries|Symbols/f-Tech.lfr/c-Technologic Symbol Library

An example of Library Manager structure built in accordance with this fragment is depicted in Fig. 15.1.

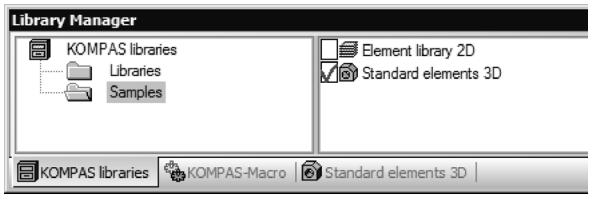


Fig. 15.1. Example of Library Manager structure

Appendix. Special Characters for KOMPAS-3D

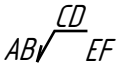
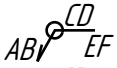
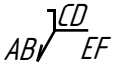
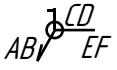
I. Creating Dimensions

1	°	Degree	6	≤	Less Than or Equal to
2	⌀	Diameter	7	≥	Greater Than or Equal to
3	±	Plus-minus	80	abcd	Text Framed
82	∓	Minus-plus	83	abcd	Root Face Size
4	×	Multiply	95	abcd	Overlined Text
14	□	Square	96	abcd	Underlined Text
77	R	Radius	169	abcd	Strikethrough Text
81	M	Metric Thread	97	abcd	Text Bailed
90	◯	Sphere	98	$AB\sqrt{CD}EF$	Square Root
68	&	Symbol &	99	$AB\sqrt[3]{CD}EF$	Cubic Root
212	~	Symbol ~	210	№	Number
5	≈	Approximately Equal			

I.I Asterisk with

100	*	Asterisk	184	*15	Asterisk with 15
8	**	Double Asterisk	185	*16	Asterisk with 16
101	*1	Asterisk with 1	186	*17	Asterisk with 17
102	*2	Asterisk with 2	187	*18	Asterisk with 18
103	*3	Asterisk with 3	188	*19	Asterisk with 19
104	*4	Asterisk with 4	189	*20	Asterisk with 20
105	*5	Asterisk with 5	190	*21	Asterisk with 21
106	*6	Asterisk with 6	191	*22	Asterisk with 22
107	*7	Asterisk with 7	192	*23	Asterisk with 23
108	*8	Asterisk with 8	193	*24	Asterisk with 24
109	*9	Asterisk with 9	194	*25	Asterisk with 25
110	*10	Asterisk with 10	195	*26	Asterisk with 26
180	*11	Asterisk with 11	196	*27	Asterisk with 27
181	*12	Asterisk with 12	197	*28	Asterisk with 28
182	*13	Asterisk with 13	198	*29	Asterisk with 29

183	*14	Asterisk with 14	199	*30	Asterisk with 30
I.II Superfix					
200	0	Superfix 0	204	4	Superfix 4
1254	+	Superfix +	205	5	Superfix 5
127	'	Superfix ,	206	6	Superfix 6
128	1	Superfix 1	207	7	Superfix 7
129	2	Superfix 2	208	8	Superfix 8
203	3	Superfix 3	209	9	Superfix 9
I.III Subscript					
111	1	Subscript 1	117	7	Subscript 7
112	2	Subscript 2	118	8	Subscript 8
113	3	Subscript 3	119	9	Subscript 9
114	4	Subscript 4	120	0	Subscript 0
115	5	Subscript 5	126	_	Subscript -
116	6	Subscript 6			
II. Angles, Tapers, Conicity					
76	∠	Taper (Left)	13	▷	Conicity (Right)
11	=	Taper (Right)	9	∢	Angle (Left)
12	◁	Conicity (Left)	69		Angle (Right)
III. Geometric and Location Tolerance					
30	Ⓜ	Dependent Tolerance	32	Ⓢ	Independent Set Tolerance
31	Ⓟ	Illegal Tolerance			
III.I Geometric Tolerance					
16	—	Straightness Tolerance	23	⌭	Cylindricity Tolerance
17	▱	Flatness Tolerance	18	⌓	Longitudinal Section Profile Tolerance
22	○	Circularity Tolerance			
III.II Location Tolerance					
24	//	Parallelism Tolerance	19	Ψ	Symmetry Tolerance
25		Perpendicularity Tolerance	27	⌖	Positional Tolerance
10	∠	Slope Tolerance	33	×	Axes Intersection Tolerance

26	◎	Coaxial Tolerance			
III.III Cumulative Geometric and Position Tolerance					
28	↗	Run-out Tolerance	20		Preset Profile Geometric Tolerance
29	⌰	Total Run-out Tolerance	21		Preset Surface Geometric Tolerance
IV. Roughness Directions					
70	═	Parallel	74	C	Circular
71	⊥	Perpendicular	75	R	Radial
72	×	Intersecting	170	P	Dotted
73	M	Arbitrary			
V. Welded Connections					
34	◺	Cathetus Size Symbol	40	A	Unlocked Line Weld
35	⌓	Remove Weld Reinforcement (Front)	148	⅂	Field Weld Symbol
36	B	Remove Weld Reinforcement (Reverse)	121		Welding Seam Symbol
37	⌣	Finished Cold Laps with Graded Taper (Front)	122		Welding Seam Symbol. Along Contour
38	⌒	Finished Cold Laps With Graded Taper (Reverse)	123		Welding Seam Symbol. Mounting Seam
15	/	Intermittent Weld or Dotted Staggered Weld (1)	124		Welding Seam Symbol. Mounting Seam by Contour
39	Z	Intermittent Weld or Dotted Staggered Weld (2)			
V.I ISO 2553:1992 Welded Seams					
1001	⌒	Flanged Weld between Plates	1013	⊖	Seam Resistance Welding
1002	‖	Square Butt Weld	1014	⌒	Flanged Weld between Plates Mirror Symbol
1003	∨	V Butt Weld	1015	∧	Square Butt Weld Mirror Symbol
1004	∠	Single-V Butt Weld	1016	∠	Single-V Butt Weld Mirror Symbol

1005		V Butt Weld with Wide Root Face	1017		V Butt Weld with Wide Root Face Mirror Symbol
1006		Single-V Butt Weld with Wide Root Face	1018		Single-V Butt Weld with Wide Root Face Mirror Symbol
1007		U-butt Weld	1019		U-butt Weld Mirror Symbol
1008		Single-J Butt Weld	1020		Single-J Butt Weld Mirror Symbol
1009		Back Weld	1021		Back Weld Mirror Symbol
1010		Fillet Weld	1022		Fillet Weld. Mirror Symbol
1011		Plug Weld	1023		Plug Weld Mirror Symbol
1012		Spot Weld			

V.II Other Marks

84		Cathetus Size Symbol (inverted 1)	86		Cathetus Size Symbol (inverted 3)
85		Cathetus Size Symbol (inverted 2)			

VI. View, Cut, Section Symbols

63		Rotated	64		Reoriented

VII. Surface Finish Symbols

171		Top. Rev. No.3 GOST 2.309–73	211		Top w/o parameters
172		Top. W ith Material Removal. Rev. No.3 GOST 2.309–73	91		Top. Without Material Removal
78		Top	92		Lower. Without Material Removal
79		Lower	87		Surface Finish. Top. Along Contour
93		Top. W ith Material Removal.	88		Surface Finish. Top. W ith Material Removal. Along Contour
94		Lower. W ith Material Removal.	89		Surface Finish. Top. Without Material Removal Along Contour

VIII. Special Characters for 4.x-Compatibility

VIII.I Roman Numerals

41	Ⅰ	Roman 1	46	Ⅵ	Roman 6
42	Ⅱ	Roman 2	47	Ⅶ	Roman 7
43	Ⅲ	Roman 3	48	Ⅷ	Roman 8
44	Ⅳ	Roman 4	49	Ⅸ	Roman 9
45	Ⅴ	Roman 5	50	Ⅹ	Roman 10

VIII.II Predefined Surface Finish Symbols

65	Rz40	Rz40	67	Rz20	Rz20
66	Rz80	Rz80			

VIII.III Greek Alphabet

51	α	Lowercase Alpha	57	Σ	Upper-case sigma
52	β	Lowercase Beta	58	σ	Lowercase sigma
53	γ	Lowercase Gamma	59	τ	Lowercase Tau
54	Δ	Upper-case Delta	60	φ	Lowercase Phi
55	δ	Lowercase Delta	61	Ω	Upper-case Omega
56	π	Upper-case Pi	62	ω	Lowercase Omega

IX. Structural Sections Notation

130	∅	Circle	143	⊏	Channel
131	□	Square/Rectangle	144	⊥	Bulb-tee
132	⬡	Hexagonal Section	145	⌊	Bulb-angle
133	Τριανγ	Triangular Section	146		Equal-flange C-type Section
134	⌓	Segmented Profile	147	⅂	Equal-flange Zee Beam
135	⏢	Trapezoidal Section	213	⌴	Unequal Channel
136	⬭	Oval Design of Section	214	⌊	Unequal Angle
137		Strip Design of Section	215	⅂⌜	Twin Equal Angles
138		Flat-bulb	216	⅂⌜	Twin Unequal Angles
139	⁝	Double Flat-bulb	217	⌐⌙	Alternate Angles
140	∟	Angle	218	⌈⌉	2-Channel Box

141		T section	219		Twin Channels
142		Double T Section			

X. Revision Numbers

149	①	Revision No.1	159	⑪	Revision No.11
150	②	Revision No.2	160	⑫	Revision No12
151	③	Revision No.3	161	⑬	Revision No.13
152	④	Revision No.4	162	⑭	Revision No.14
153	⑤	Revision No.5	163	⑮	Revision No.15
154	⑥	Revision No.6	164	⑯	Revision No.16
155	⑦	Revision No.7	165	⑰	Revision No.17
156	⑧	Revision No.8	166	⑱	Revision No.18
157	⑨	Revision No.9	167	⑲	Revision No.19
158	⑩	Revision No.10	168	⑳	Revision No.20

XI. Special Characters for Engraving

173		Character Cell 12.0 for characters 2, 3,...	177		Character Cell 17.6 for characters D, M,...
174		Character 14.4 for characters D, M,...	178		Character Cell for characters D, M,...
175		Character 15.2 for characters D, M,...	179		Character Cell 20.8 for characters D, M,...
176		Character Cell 16.0 for characters D, M,...			

XII. Graphic Notation Conventions in Charts. GOST 2.751-73

201		Twisted Pair	202		H-type Cable

Index of terms