TURQUM® TURKISH QUALITY OF MACHINERY

PRODUCT CONFORMANCE SPECIFICATIONS

-COMPRESSORS-

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1. GENERAL INFORMATION

1.1. (OAIB) TURQUM Quality Mark

This mark is a quality indicator granted to manufacturers whose conformances to the specifications in this document have been proven by the Central Anatolian Machinery and Accessories Exporters Union (OAİB).

This mark to be offered for the use by the manufacturers producing machinery and accessories and exporting abroad is not mandatory and shall be offered for the use of the manufacturer after the conformance of the products within the scope of the application with the related OAIB "***Product Conformity Assessment Specifications***" are determined. The products bearing the TURQUM Quality Mark shall have the qualification of a joint brand with a certain quality and address, which are reliable that create a privilege with their quality and easily recognized and preferred with their logo by the customer in the markets within the country and abroad.

While the said Quality Mark (TURQUM) provides goods of a high quality and reliability and a long term guarantee-service capability to the customers worldwide they will also assist the manufacturer to achieve the level of quality to enable them to compete with their competitors in developed countries, increase their customer potential and market share and aid the company to maintain and quality production system with a global level of quality.

The TURQUM Quality Mark is not only a system for testing and control of the final product but is at the same time a systematic approach foreseeing that the total production system of the producer is of a certain level of adequacy and quality.

Based on this approach:

*If **a production facility is** of the required **qualification** in terms of quality required **for a compressor group,** the compressors of the manufacturer produced at that facility in a similar manner and which are in the production program of the manufacturer shall **also** be **considered to be adequate** in terms of quality.*

If, due to technical limitations at the facility any **size limitation is required** on the product this shall be additionally **specified** in the certificate.

1.1.1 Certification Process

TURQUM Quality Mark certification process consists of 5 phases:

- **Application;** Application by the manufacturer by filling out the application form and submitting mandatory documents in its attachment to OAIB in order to obtain the right to use the TURQUM Quality Mark.
- **Document Examination**
- **Audit at the Facility;** is the examination of the conformance of the manufacturer to the conditions specified in the "***Product Conformity Assessment Specifications***" by the audit

team at the manufacturer facilities. This audit includes stages such as the document, production and quality processes, equipment, personnel, test activities, final product examination.

- **Certification; Product Conformity Assessment Agreement** is signed with those manufacturers whose conformance to ***Product Conformity Assessment Specifications*** have been determined in previous stages and they are given the right to use the Product Conformity Assessment Certificate and TURQUM Quality Mark.

- **Monitoring;** is the monitoring of the continuous conformance of the products of the manufacturer who has obtained the right to use the TURQUM Quality Mark to the ***Product Conformity Assessment Specifications*** by methods such as controls and customer complaints.

2. PURPOSE and SCOPE

2.1. Purpose

The purpose of this "***Product Conformity Assessment Specifications***" is to clarify the conditions that compressor manufacturers who wish to obtain Quality Mark (TURQUM) are required to meet in terms of production, quality, test, service, spare parts etc. activities and the technical specifications of the product.

2.2. Scope

These product conditions cover;

- Prerequisites,
- Machinery, Equipment and Test Stands,
- Conditions Related to the Personnel working on the Production and Design,
- Personnel related to Quality Control,
- Safety and Technical Conditions Related to the Product,
- Warranty Conditions,
- User Manual, Spare Parts and Service Conditions

that the manufacturer is required to meet in order to supply a better quality to its customers.

3. DEFINITIONS and ABBREVIATIONS

General Secretariat of Central Anatolian Exporters' Union (OAIB): Is the party which evaluates and certifies the product quality of the manufacturers according to the "***Product Conformity Assessment Specifications***" and any other document required for the evaluation of the product.

Product Conformity Assessment Procedure: Is the process of evaluation and certification of the product quality according to the product conformance specification and any other document required for the evaluation of the product performed by OAIB.

Product Conformity Assessment Agreement: Is the document signed between the Manufacturer and OAIB describing the rights and obligations of the parties arising out of certification activities.

Product Conformity Assesment Certificate: Is the document prepared by OAIB in the name of the manufacturer within the scope of the agreement made between the manufacturer and the OAIB showing that the product has been examined and found to be in conformance with related ***Product Conformity Assessment Specifications***

TURQUM Quality Mark: Is the TURQUM logo, the copyright of which is owned by OAIB and which companies certified with the "Product Conformity Assessment Certificate" obtain the right to use.

Manufacturer: Is the company producing the machinery, accessories and equipment requesting Product Conformity Assessment Certification services.

Product: Is the machinery, accessories and equipment produced by the manufacturer.

Product Conformity Assessment Specifications: Is the related document prepared by the Sector Committees formed for the product by OAIB and which includes the conditions and technical regulations that the manufacturers are required to meet in order to obtain the **TURQUM Quality Mark**.

OAIB Machinery Quality Certification Department (MQCD): Is the office formed within OAIB in order to prepare all documents related to Product Conformity Assessment Certification activity, keep records, engage in promotional activities, have a duty in the QT, responsible for evaluating and accepting applications.

Quality Team (QT): Is the team formed by the manufacturer company within its own organization responsible for coordinating all product conformity assessment activities and consisting of at least 2 people.

Customer: Is the real or judicial person who buys and uses the product bearing the TURQUM Quality Mark.

Audit: Is the process that OAIB conducts in order to examine and evaluate the production facilities and the products of the manufacturer in relation to the product conformity assessment certification activities according to the related product conformance specifications. The audits consists of certification, follow-up, control, scope and address change controls.

Audit Team (AT): Is the team consisting of 1 chief auditor and at least 1 auditor assigned to examine and evaluate the products of the manufacturers according to the related product conformance specifications and responsible for conducting the audit on the site and on document, reporting the results and submitting to the Certification Committee.

Warranty: Is the certificate given by the manufacturer to the customer regarding the compressor does not have any materials, workmanship and production faults and which brings certain obligations to the manufacturer to be valid for a certain period.

Service: Is the after sales repair-maintenance and service given for the compressor in case requested by the customer.

4. PREREQUISITE

4.1. The manufacturer who applies to OAIB in order to obtain the Quality Mark (TURQUM) should be a compressor manufacturer and should be operating in the said production area **for at least 3 years**.

4.2. In the event of any standard being in force related to the compressors, the manufacturer produces and exports the compressor is required to meet said Turkish Standard and meet the conditions of the product standard. In the event there is no Turkish Standard in effect related to the compressor; the compressor of the manufacturer should be manufactured according to the TSEK mark, EN Standard and/or international standards (ISO, DIN, BS, ANSI etc.) or a standard mandated in the country where the compressor is being exported to and said product should meet the conditions of the standard.

4.3. The manufacturer should have the ISO 9001:2000 Quality Manufacturer System certificate or should meet the quality management system conditions. The ISO 9001:2000 certificate or the quality management system of the manufacturer should cover all the facilities where the compressors he applies to obtain the TURQUM Mark are produced.

4.4. The manufacturer should hold the CE mark or meet the related CE Mark regulations related to the compressor he applies to obtain a Product Conformance Mark for.

4.5. The manufacturer should be producing according to the related legal, environmental, work health and safety legislation.

5. MACHINERY, EQUIPMENT AND PERSONNEL CONDITIONS

5.1. Machinery, Equipment and Test Stand

5.1.1. The manufacturer should have the machinery and tool park of sufficient qualification to be able to produce to the accuracy it specifies in the manufacturer instructions throughout the process stages of the product from the raw material to the formation of the final product together with the required measurement, control and test equipment.

5.1.2. The manufacturer should have evaluated all factors for all the machinery/equipment used in the production which may impact the production quality adversely (temperature, dust, moisture, vibration, interaction of the machinery, access of unauthorized personnel etc.) and taken all required measures.

5.1.3. The manufacturer should continuously review all his equipment /infrastructure /auxiliary facilities during the production period and keep at the sufficient qualification capable of producing the product at the foreseen qualifications.

5.1.4. The manufacturer is required to have a test stand to be able to conduct the performance tests of the compressors he manufactures at required sensitivity. It is mandatory that the sensitivities and accuracies of the measurement devices here are calibrated to cover the periods in which the test is conducted.

5.2. Personnel Assigned for Production and Design

5.2.1. All personnel working at the production should have the qualification required of their fields (with sufficient level of training, experience, knowledge and accumulation).

5.2.2. The technical personnel of the companies shall be of sufficient number and sufficient level in terms of production engineering, workshop, project construction and R&D.

5.2.3. The personnel working at special processes (welding, non-destructive testing, X-ray etc.) should be certified in their fields.

5.2.4. The manufacturer should be using modern engineering methods and requirements (Finite Element Analysis, CFD or computer calculated programs etc.) in the compressor design and R&D.

5.3. Quality Control Related Personnel

5.3.1. The compressor manufacturer should have formed a **Quality Team (QT)** having sufficient experience and training in order to continuously control the product quality and raise the quality. The *Quality Team(QT)* should be independent of the production and should operate directly attached to the top management.

5.3.2. The manufacturer should form a *Quality Team (QT)* consisting of 2 people (a production authority and a quality authority) within the organization before applying for the TURQUM Mark.

The QT is responsible for coordinating the work to be done within the company regarding the TURQUM Quality Mark, preparing the documents and related papers, conducting activities related to increasing the effectiveness of the Mark, to contact with the OAIB, to accompany the audits, to provide required information and document for the audit team. The QT should be directly reporting to top management. The QT performs its duties in harmony with the existing *QT* of the company. The QT may also have other duties within the manufacturer's organization.

6. QUALITY CONTROL ACTIVITIES

6.1. Methods of data analysis, failure prevention and determining/eliminating failure causes are one of the major elements of the Product Conformity Assessment Mark. Therefore the

manufacturer should be using and making use of effective and valid quality control, monitoring evaluation and improvement techniques in the compressor manufacturing line.

6.2. In the light of the techniques mentioned in article 6.1 the approach of the manufacturer for improving its processes should be:

- To determine the expectations from the process for each process (product specifications, period, fault rate etc.),
- Determination of fault causes in the light of the data obtained by evaluation of the machinery, materials, method, measurements, people, environmental factors,
- Conducting systematic work related to elimination of causes for failure by suitable methods,
- Evaluation of work conducted.

6.3. The manufacturer, in addition to the control-test activities in the interm processes on the compressor production line and on the final product, should be using the error prevention and improvement methods practiced in the quality control field.

6.4. The calibration of measurement tools and apparatus used in the control and monitoring of the quality should be made by an accredited organization at required intervals.

6.5. The manufacturer should be applying tests on the final product meeting the standard related to the product for the determination of the qualities specified in the manufacturer procedures and technical product catalogs.

6.6. The manufacturer, in addition to the conditions of the ISO 9001:2000 regarding Purchasing and Suppliers, should be conducting work related to the improvement of the quality of the compressor and the parts produced by its suppliers for the compressor such as the rings, casting and engine.

6.7. It should be determined that the supplier holds required standards and documents. A method is required to have been developed to trace the defective products and semi-finished goods arriving from the supplier with regards to the lot date, code and additionally the materials inspection should have been provided for.

7. SAFETY AND TECHNICAL CONDITIONS

These conditions do not substitute the Turkish Standards, related international standard and CE regulations but cover additional safety and technical criteria related to the compressor. Because there are different compressor structures and types the technical specifications specified here cover general requirements for all positive displacement compressors and among the technical conditions that are for a specific compressor type and/or those that do not apply for all compressor types shall be kept excluded from the compressor types for which they do not apply.

7.1. The installation, operation and maintenance catalogs prepared for the related compressor family shall be submitted for the examination of the auditors. In such catalogs in addition to the

matters foreseen by the CE mark it shall be determined whether additional safety measures arising out of the type of the compressor type are provided.

7.2. The manufacturer should determine the reference environmental conditions which may affect the operation of the compressor and state those in the user manual.

7.3. On the compressor should be the name, address of the manufacturer, the compressor model/type, production year, serial no information and the basic technical specifications such as the free air efficiency of the compressor, operating pressure and nominal motor power should be printed directly in a manner to resist wear or by an identification plate.

7.4. The direction of rotation of the compressor compression block should be marked in a legible and visible manner.

7.5. In the user manual of the compressor the characteristics of the connection basis and the anchorage connections and the precautions that need to be taken to prevent vibration should be shown.

7.6. The manufacturer should not be using used or discharged parts. This does not mean not using materials "obtained by re-cycling".

7.7. The components used in the compressor shall be painted/coated etc. in a suitable manner not to include any irregularities, scratches, oil, dirty appearance etc. type factors. The compressor coating/paint etc. should be resistant to corrosion and should be in a manner not to be damaged under the operation conditions of the compressor for reasons such as temperature, vibration etc.

7.8. The accessories and spare parts the manufacturer uses in the same model and type compressors should be of the same standard dimensions and should be usable in place of one another by replacement when required.

7.9. The static and dynamic stabilities of the rotary parts should have been made and it should be ensured that the limits in the norms are met.

7.10. Sealing elements should have been designed and controlled for performing their functions. The bearings used should be designed against peripheral and axial movement, and should be fixed on the axis and its casing after the bearing has been selected.

7.11. The manufacturer should specify the parts it has used in the compressor which may be subject to wear by use and their approximate wearing life (sealing members, bearings, filters, separator elements etc.) and state in the user manual the effects of such wear and the precautions to be taken.

7.12. The power unit of compressor (electrical motor, steam turbine, internal combustion engine etc.) should be capable of meeting the shaft power of the compressor block as specified in the Turkish Standards and/or related international standards, additionally, should be able to meet the

reserve power that results in the change to the compression ratio due to filter – separator pollution, environmental conditions etc.

7.13. In cases where the compressor drive is provided by an electric motor insulation class, protection class of the motor, permitted mains voltage range (400±%10 etc.), power should be specified in the user manual and technical documents and the motor should meet the standards. Again in this case, the identification plate bearing the name/address of the manufacturer, power, revolution, current, voltage, frequency, cos ϕ value, and the insulation class should be present. For drive units other than electric motors the identification plate bearing the name/address of the manufacturer and suitable technical information should also be present. If the manufacturer is having OEM production made in its name it may print its own name in the label instead of the manufacturer. In this case the country shall guarantee that it assumes the total responsibility for the motor.

7.14. The manufacturer should have either obtained the related capacity values for the compressor according to ISO 1217, 1996 Annex C on its own test stand or in laboratories having required qualifications to perform the tests. These characteristics should be stated in the technical document/user manual prepared for every compressor type it applies for the TURQUM Mark. In these manuals additionally the power consumption values for the specified pressure and capacity values should also be provided. Additionally, the manufacturer should be able to determine the vibration level, noise level, bearing temperature etc. in case the customer requests

7.15. The manufacturer should apply a hydrostatic pressure test with clean cold water to on the pressure vessels on the compressor or at standards (PED, 97/23/CE, 87/404/CE) related to the systems as specified. Such components used by the manufacturer should be approved and certified by an independent accredited organization as required by the CE mark.

7.16. The manufacturer should package in a manner not to damage its performance, function and physical appearance during transportation and storage. The manufacturer should take the required parts under safety, in order to prevent any damages caused by the vibration during transportation to arise at the compressor and should have affixed a warning label stating this matter.

7.17. The compressor should be suitable to operate in closed ambient where air flow is provided under normal conditions and in the event the compressor shall be used only in open spaces protective measures on the compressor (dust, rain, excess temperature) should have been taken. This matter should be stated in the user manual and technical documents. The motor protection class should be according to the operating conditions.

For example, if an open case machine is to be made that will be operate in open motor(IP23) should not used due to risk of water ingress.

7.18. The manufacturer is responsible for the performance of all controls and tests specified in these technical specifications. The places where the manufacturer obtains test services should be of suitable qualification to perform the test according to related standards and have validated the methods used.

7. WARRANTY

7.1. The manufacturer should observe The Consumer Protection Law numbered 4077 in effect of the "Turkish Republic Ministry of Industry and Trade" and related legislation of the countries it exports to.

7.2. The manufacturer, if it exports, in addition to the warranty certificate prepared in Turkish for every compressor it sells, should also prepare a copy of the certificate in the language of the country it exports to or in another language deems suitable by that country.

The Warranty certificate should include:

- The name, full address and communication information of the manufacturer
- Signature of the manufacturer's authorized person and the country stamp,
- The model, type and serial number of the compressor under the warranty coverage,
- The warranty period and the date it takes effect,
- Matters included and excluded with the warranty,
- The obligations of the manufacturer and the consumer during the warranty period.

7.3. The manufacturer should provide a **minimum of 2 year** warranty following the sales date that the compressor it has sold is free of any material, workmanship and production faults and shall perform correctly "when the conditions of use given in the user manual are taken into consideration"

8. USER MANUAL, SPARE PARTS AND SERVICE

8.1. User Manual

8.1.1. The manufacturer should prepare a user manual for every compressor bearing the TURQUM Quality Mark and deliver this manual to the customer for every compressor it sells.

8.1.2. In addition to the user manual prepared in Turkish if it exports it should prepare a copy of the manual in the language of that country or the language deemed to be suitable by the country.

8.1.3. The user manual prepared for the compressor should include:

- All technical specifications related to the compressor,
- Full safety instructions related to the transportation, installation, functioning and maintenance of the compressor and detail information and drawings describing its operation (transportation, installation, electrical connection diagrams etc.)
- A maintenance and lubrication instruction describing all maintenance and lubrication procedures for the compressor with drawings and tables where required, and including the maintenance-lubrication period, the equipment required to be used and the lubricant types,
- An exploded drawing, lists and main consumables replacement instructions showing all parts of the compressor,
- Possible failures which may arise related with the compressor, their causes and information on how they can be remedied,

- Up to date information regarding how the product and spare parts shall be ordered (product, spare part codes, explanation of the coding system etc.),
- Communication information regarding after sales services of the manufacturer related to the compressor (service, spare parts request, advice etc.).

8.2. Spare Parts

8.2.1. The manufacturer should be able to provide all spare parts for the compressor it sells **for a period of 10 years** following the sales date and should include the clause that they shall be provided in the sales agreement it makes with the customer.

8.2.2. The manufacturer should have the inventory systems and structure to provide the spare parts requested by the customer in the shortest possible time and if an agreement has been made with the customer regarding the time to provide spare parts, it should be able to provide spare parts in the timeframe mentioned in such agreement.

8.2.3. The manufacturer should deliver the spare parts it provides to its customer together with documents with instructions and/or drawings showing how they should be installed.

8.3. Service

8.3.1. The manufacturer should be able to provide a high quality and reliability after sales service related to the compressor it sells. Related required information shall be shared with the auditor regarding the service organization and its capabilities.

8.3.2. The manufacturer should have formed the service organization to provide its customer the service of required qualification and in short time. In this scope:

- Manufacturer's teams providing the service should be in good control of all technical/practical/safety information related to the compresor and trained to be able to provide all kinds of services.
- The service organization and teams of the manufacturer should have the infrastructure facilities to provide all kinds of services related to the compressor (building, vehicles, hand tools, spare parts, test and measurement devices etc.).
- If an agreement has been made between them regarding the manufacturer shall intervene with the compressor within the shortest possible period following the service required is communicated it should be able to provide service within the timeframe mentioned in such agreement.
- In case of an emergency service request for sudden stops in the production of the customer resulting from compressor failure, the manufacturer should have specify a time period in the sales agreement a time period that it is capable of providing service especially for such a condition. There should be evidence that the manufacturer is capable of providing such service.
- The manufacturer should be able to provide services for the compressor it sells **for a period of 10 years** following the sales date and should include the clause in the sales agreement it makes with the customer that it is capable of providing the same.

- The manufacturer should be able to provide for a fee planned maintenance services related to the compressor it sells.
- The manufacturer should have a system to track all kinds of the service requests by its customers and the records of the services provided for a period of 10 years in the past.
- The data of the manufacturer obtained from the service organization systems, (its own product quality, services and customer satisfaction) shall be analyzed and evaluated to improve the service.

The manufacturer may provide these services through an organization within its own country or via a distributor, authorized organization etc. In case a distributor, an authorized organization etc. is used it should prove that it is capable of meeting the conditions of Article