KEYENCE

NEW **3-Axis YVO4 Laser Marker**

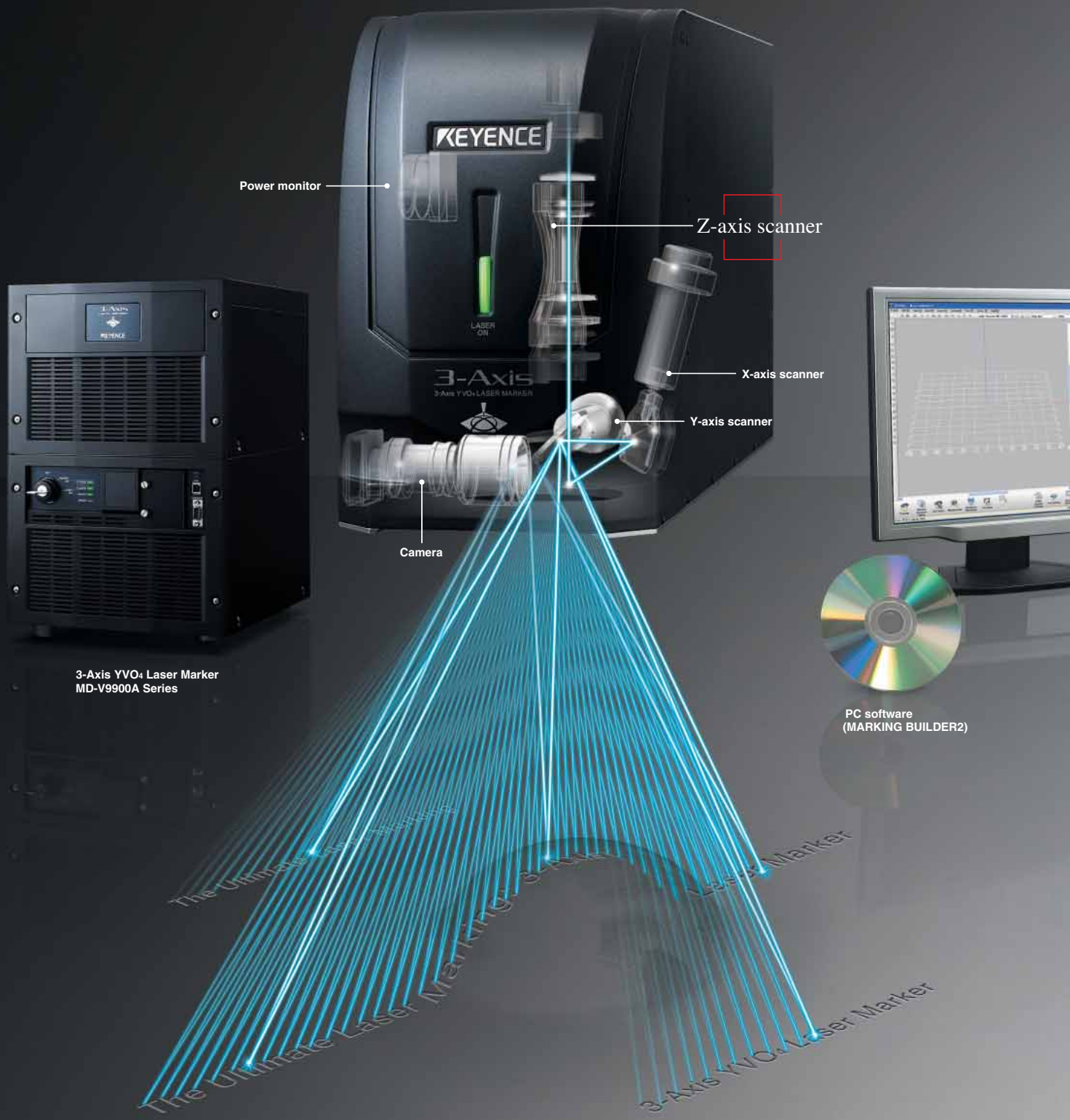
MD-V9900A Series

World's first

High-power YVO4 with 3-Axis control

CE

High-speed, high-quality and 3-Axis marking delivered in a powerful YVO_4 laser package



High Power YVO4

Ultra-high quality marking enables high-power output

World's first

DEPC (Dual End Pumping Cavity)

Double the power of traditional systems

World's first

High peak power with ultra-short pulse width

Sharp marking without damaging the product

Best in its class

Single mode beam spot

High quality laser beam creates clear contrast on a wide range of materials

World's largest range

Ultra-high pulse recurrence frequency 400 kHz

Smooth marking is possible on high speed production lines

YVO4 laser marker

The YVO4 laser marker employs YVO4 as its laser crystalline media for stable high-quality marking. Currently, YVO4 crystal is one of the best media for superior high-power performance and stability using a diode pumping solid state laser.

3-Axis

3-Axis control provides performance that is ahead of its time

World's first

42-mm variable focal length

Significantly reduces setup time and man-hours

World's first

Variable spot size

Defocusing without changing the size of characters or marking position

Largest in its class

300 x 300-mm wide area

Covers a wide area without attenuating the laser accuracy

World's first

3-Axis marking with outstanding visibility

Precise marking on irregular target shapes

3-Axis

For the first time in the industry, a laser marker has the capability to perform marking not only in the X and Y directions, but also the Z direction! The 3 axis motion allows for outstanding visibility on deformed or curved surfaces, and makes it easy to mark targets that vary in height. This makes the MD-V the most versatile laser marker on the market today.

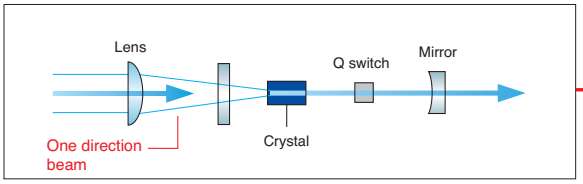
High-power YVO_4 laser balances marking time reduction with high quality

More than double the optical exchange efficiency of conventional systems

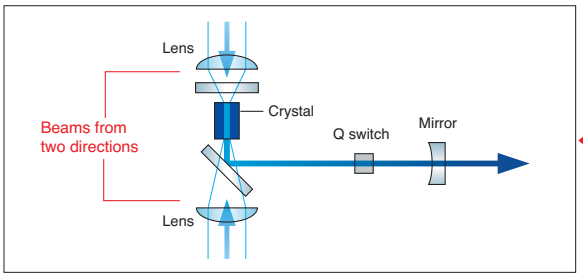
Bearings (black coloration marking)

DEPC (Patent pending)

The MD-V9900A Series is equipped with the newly developed DEPC (Dual End Pumping Cavity). The DEPC significantly improves the optical exchange efficiency compared to that of a traditional end pumping system. This higher efficiency means that the diode has to use less current to generate the equivalent power, reducing energy consumption and increasing diode life.



Traditional end pumping



DEPC (Dual End Pumping Cavity)

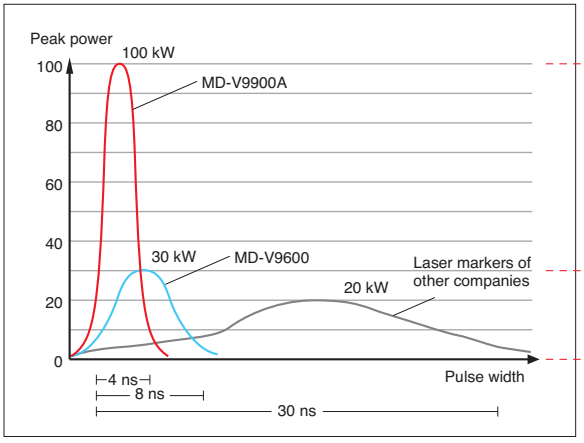
Efficiency is more than doubled

World's best

Digital camera enclosure (alumite removal)

100 kW peak power & short pulse laser

With a peak power of 100 kW (triple the peak power of conventional systems), the MD-V9900A can achieve sharp, high quality marking on hardened surfaces. This 100 kW is also generated with an incredibly small pulse width, reducing the possibility of thermal damage to the target surface.



More than three times the peak power

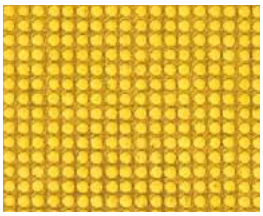
High peak power	▶ Useful for metal digging or resin coloration
Short pulse width	▶ Less thermal damage on target surface

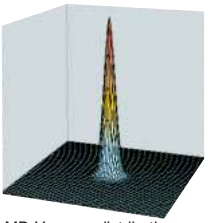
Best in its class


ITO film (coating removal)

Single mode beam spot

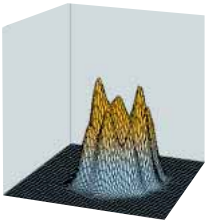
The MD-V Series utilizes an end-pumping YVO_4 laser system that generates an ideal laser beam. Conventional systems are forced to employ a multi-mode laser, leading to fluctuations in laser power and target quality. Single mode laser's concentrate the beam to provide high quality marking on a wide range of surfaces.


MD-V marking photo 300x


MD-V power distribution

Power peaks are concentrated on the center of the beam. Furthermore, ultra-short pulse marking enables sharp marking without adding extra stress.


Traditional YAG marking photo 300x


Traditional YAG power distribution

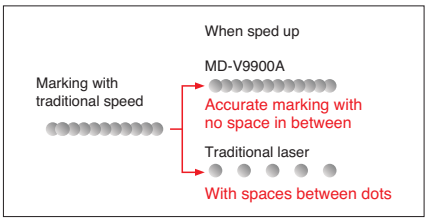
Peaks of power exist randomly in the beam. This is equivalent to using a lot of low powers to mark characters on a target surface. It is difficult to mark characters uniformly.

World's largest range


Transistor (coloration marking)

Ultra-high pulse recurrence frequency 400 kHz

The MD-V9900A Series employs a Q switch frequency more than double that of previous KEYENCE lasers. The high frequency enables smooth marking of fine resolutions on high speed productions lines. Both continuous wave and pulse oscillation are available to accommodate varying surface conditions



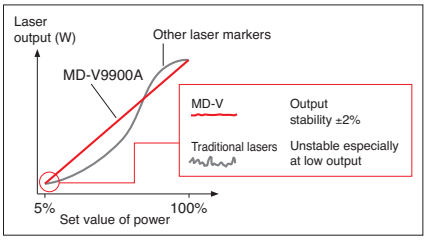
Adjustable over a wide range from CW (continuous wave) to 400 kHz pulse

Stability ±2%


Keys on a mobile phone (coat peeling)

Power linearity

The power linearity of traditional laser systems is typically +/-5%, and could be even larger at low power. The MD-V9900A achieves and incredible +/-2% power stability, meaning that the marking will never chip, burn, or blur.



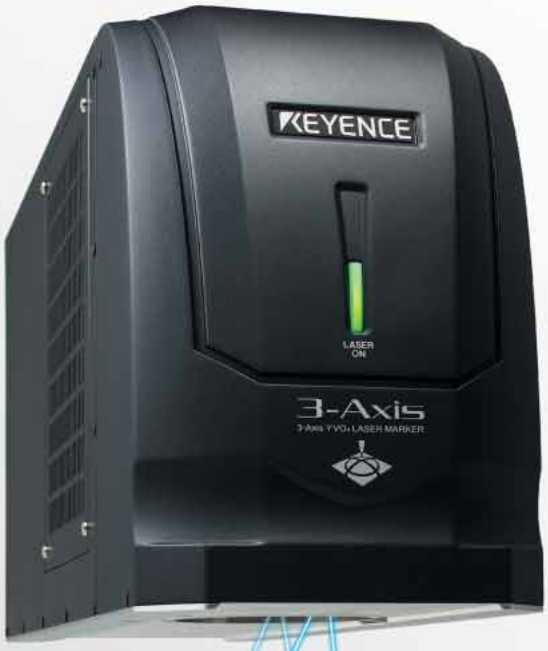
Installation, mark quality, and accuracy can be improved through 3-Axis control

World's first

Variable focal length

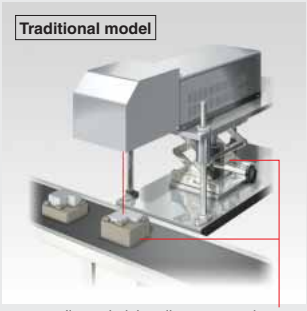
The 3-Axis laser control (X, Y and Z-axes) sets the maximum spot position at any focal length. The focal length can be set within a 42-mm range without attenuating the flatness of the marking area.

Enclosure made of resin
(marking on stepped surfaces)



Significant reduction in installation costs minimizes the setup time and man-hours

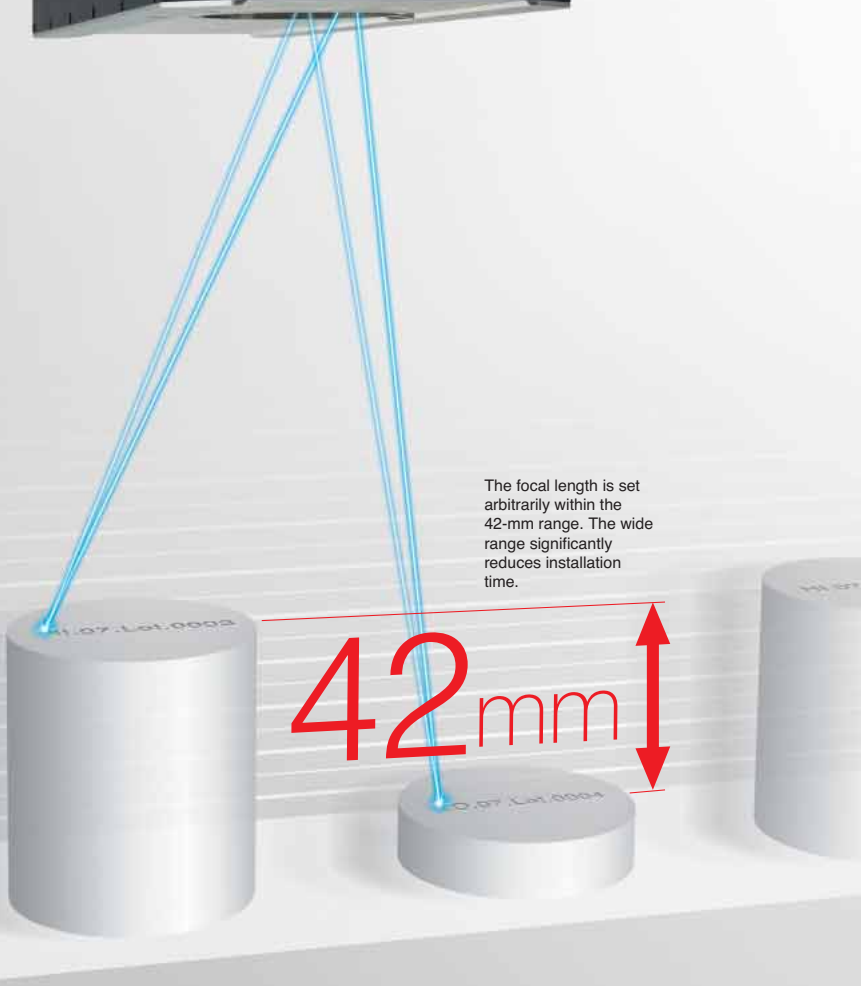
Traditional model



Jigs or height adjustment equipment is necessary.

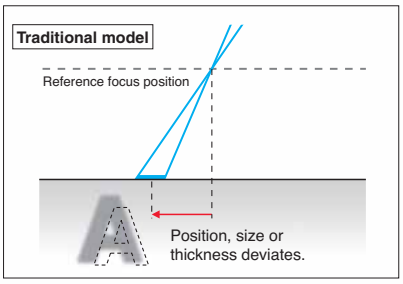
A vertical adjustment mechanism was necessary to move the laser head to the proper focal distance, or the focal point had to be adjusted for each workpiece using a suitable work placement jig. Setting the vertical adjustment mechanism or placing a suitable work placement jig demanded high installation costs.

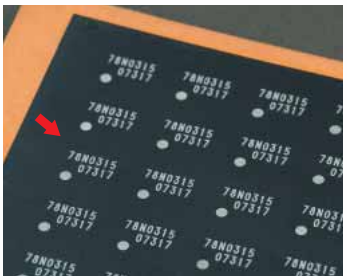
The focal length is set arbitrarily within the 42-mm range. The wide range significantly reduces installation time.



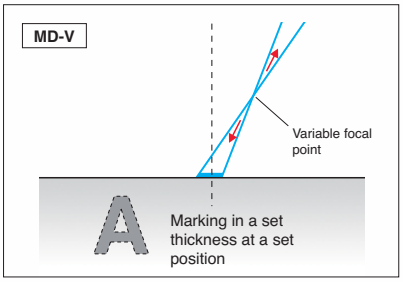
World's first Variable spot size

Varying the spot size of the laser is helpful when trying to enhance the contrast of characters on specific materials, or engrave more deeply into the target surface. Typical defocus techniques may cause varying character size and position, while the MD-V can provide uniform quality of characters.





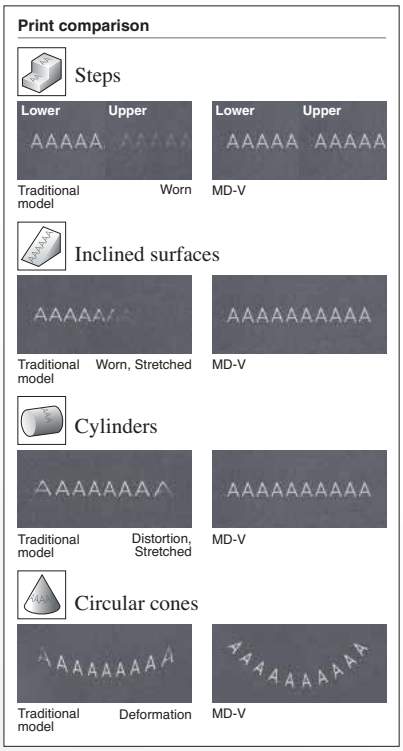
LSI (High accuracy marking with defocusing)



World's first 3-Axis marking

The MD-V9900A Series features 3-Axis control to modify the laser position according to the shape of a target, which can include steps, inclined surfaces, cylinders or circular cones. The MD-V9900A Series minimizes distorted, worn or chipped characters while enabling uniform marking on three-dimensional surfaces that are considered untouchable by conventional markers.

A switch on an instrument panel (marking on a 3D solid)



A 300 x 300-mm wide marking area without a reduction in accuracy.

High accuracy
300 x 300 mm

Largest in its class

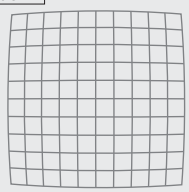
300 x 300-mm wide area

Marking in a large area often requires moving a target workpiece using an X-Y stage, or switching the lens on a conventional laser to create a wide marking area. Using an X-Y stage increases integration costs and time, and also decreases product throughput. A wide area lens can help these problems, however characters are often displaced or blurred at the edge of the marking area. The MD-V9900A Series utilizes a special lens system along with its unique 3-axis control to create a highly accurate 300 x 300-mm wide marking area, eliminating the need for mechanical adjustment while maintaining character integrity.

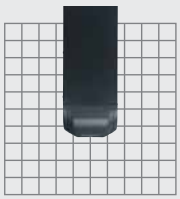
The KEYENCE advantage when marking over a wide area:

Problems associated with the properties of the Fθ lens of conventional systems have been eliminated, so characters stay clear and crisp over the entire marking area.

Traditional model Area distortion due to lens characteristics

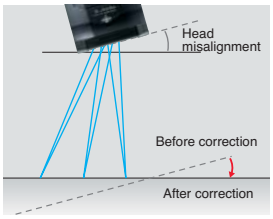


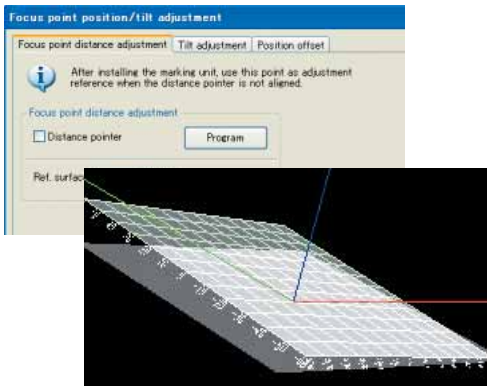
MD-V Area in which deformation and distortion are corrected



Mounting position Correction

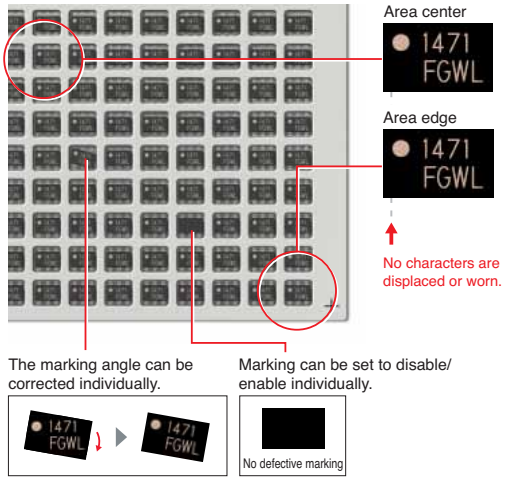
The dedicated software easily corrects the head inclination after integration using X, Y and Z-axes, without the need for mechanical adjustment. This feature significantly reduces the man-hours for installation.





Pallet marking

Identical characters or serial numbers can easily be marked at high speed on multiple workpieces, such as electronic components in a tray. The MD-V can disable marking or correct inclination for individual targets. Additionally, the dedicated communication algorithm significantly reduces coordinate adjustment via communication lines.



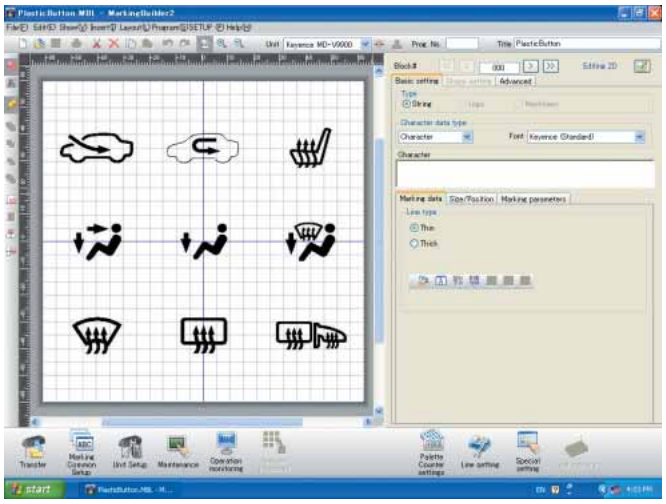
Dedicated software simplifies setup

Marking Builder 2 (2D & 3D) *OPTION

With the Marking Builder 2 software, two dimensional marks can be attached easily to three dimensional figures on the screen. Anyone can set the best suitable marks on a variety of shapes including steps, cylinders, inclined surfaces, circular cones and more.

Basic operation

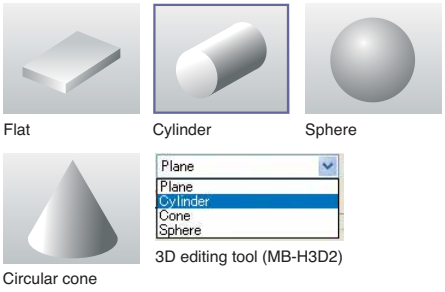
Step 1 Edit marks in the two dimensional setting window



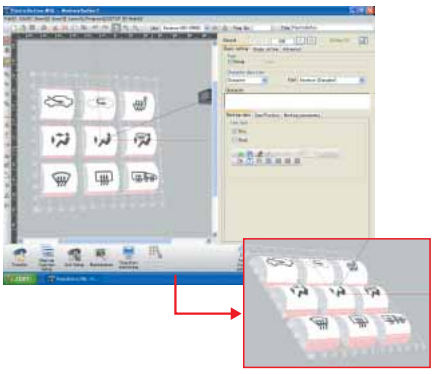
Marking Builder 2 software

Step 2 Select a figure

Select a figure from the standard four figures, which includes a flat, cylinder, sphere or circular cone, and attach the mark on the selected figure.



Step 3 Organize marks in the three dimensional setting window



Marks can be viewed and inspected stereoscopically by changing angles at your command.

Step 4 Mark the target

Font Architect

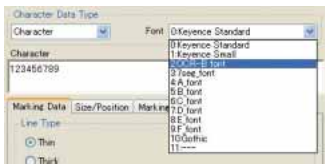
▶ In addition to the 2 standard fonts, it is possible to add 10 fonts.

Flexible printing for each user.

Original font x 2

User font x 10

It is possible to freely alter the font from the registered system font. It is also possible to differentiate within settings.



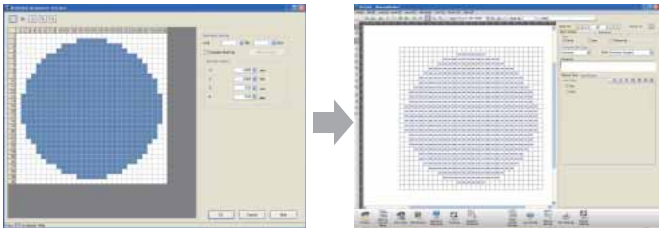
Easy Palette setting

▶ Maximum of 65,025 units allocated in a bundle.

Wafer layout before dicing is speedy and true because easy layout and individual print setting is possible.

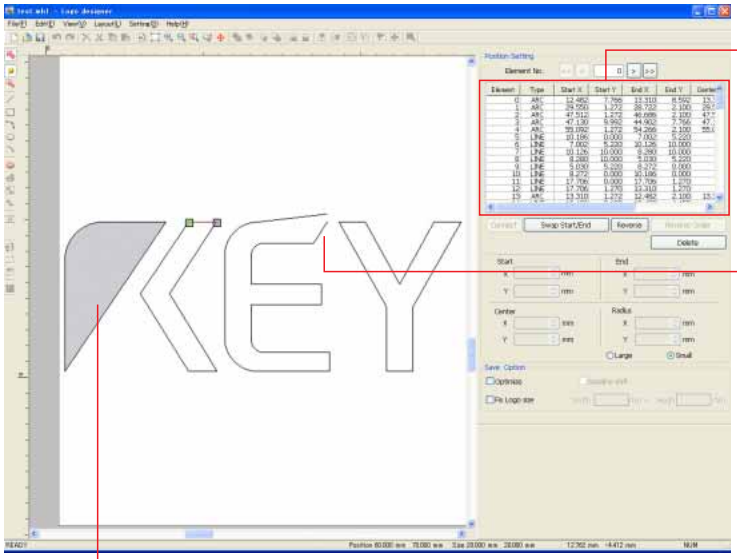
Assign individual print locations. Loading from a CSV file is also possible.

Easy layout with Marking Builder. Realize a significant reduction of working hours for edit work.



Logo designer *OPTION

Logo designer is a new application within Marking Builder 2 that can import DXF files, do various pattern fill effects, and also select areas to fill.
Success is easily achieved by importing various designs in order to get the optimal conditions for the printing target.

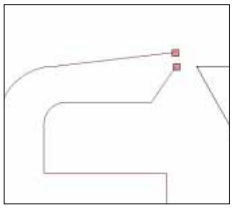


List

Select the coordinates from the displayed list. The stroke order can be freely changed.

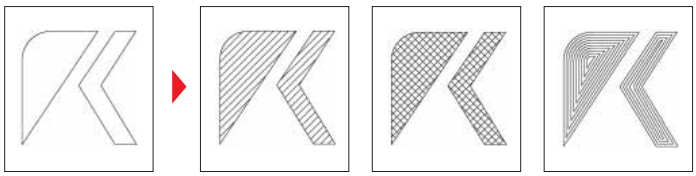
Disconnected line detection

The disconnected part of the contour line is displayed. Even when a complex design is imported and the connections aren't perfect, contour lines can be easily connected.



Various hatching functions

Fill effects of designs such as a logo can easily be changed without using CAD. The hatching pattern can select diagonal lines, intersecting lines, contour lines, etc. and optimally fill according to the marking target.

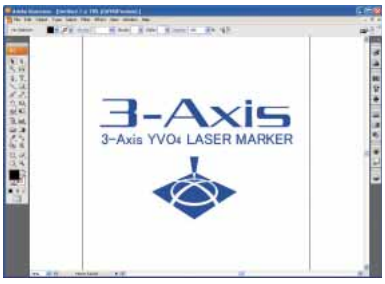


Closing lines　Diagonal lines　Intersecting lines　Contour lines

Illustrator plug-in *OPTION

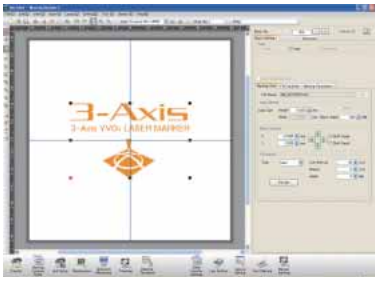
It is possible to load logo mark designs created in Illustrator directly into Marking Builder.
After loading, parameter editing of hatching adjustment can be done in the edit screen.

Create logo design graphics with Adobe® Illustrator®



Create designs with Illustrator

Load into Marking Builder directly as a logo mark.



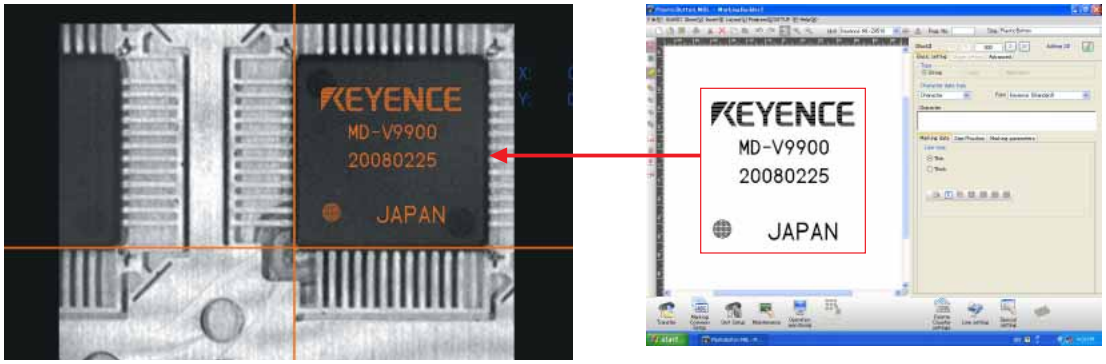
Hatching editing can be done easily in the Marking Builder screen.

*Adobe® Illustrator® is a registered brand of Adobe.

Improve productivity with our ...

NEW Viewfinder function

There is a built-in camera inside the laser marking head. Unlike an external camera, it is possible to confirm the position adjustment and marking results with the built-in camera since the image doesn't shift when marking.

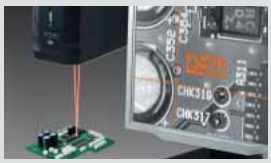


Alignment view function

It is possible to adjust and confirm the marking position by displaying the characters and logo on the viewfinder screen. Anyone can easily and surely mark because it is possible to configure the workpiece marking using the software.

Advantages of the built-in viewfinder

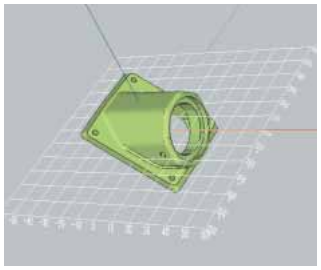
- **Even with little effort, it is easy to adjust the positioning.**
- **When using the built-in camera, it is possible to confirm the position adjustment and marking results since the image doesn't shift when marking.**
- **It is possible to adjust the position with the protective covering done.**



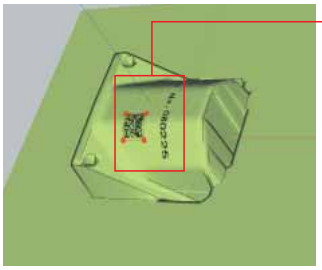
It is possible to use concentric shooting to eliminate position slipping

Z-MAP Creator *OPTION

3D-CAD can be imported to Marking Builder as a bedsill of the tridimensionality marking. Achieve 3D image marking with shapes that are not expressible with basic marking.



3D-CAD (STL format) Screen



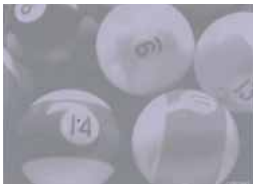
Z-MAP Screen

3D-CAD data (STL format) can be converted into Z-MAP (Marking Builder only data) with the touch of a button. After the conversion, the CAD data is used as a foundation and it is possible to change the characters and logo.

High Resolution Photographical marking function

The “High-res” Photographical marking” function that accurately duplicates high quality graphics is on board. Because of the fine control possible with the YVO_4 laser, the realistic sensation of a picture is duplicated as it is with laser marking.

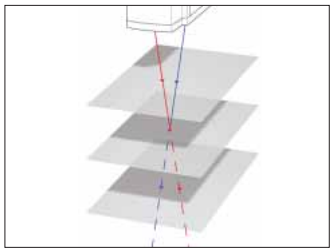
Conventional



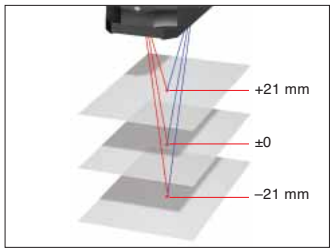
“High-res” Photographical marking

Variable distance pointer (Patent pending)

Two types of red guide beams show the optimum marking distance on a workpiece. Different from traditional pointers, the focal point can be focused based on the pointer's position without changing the laser head or workpiece height.



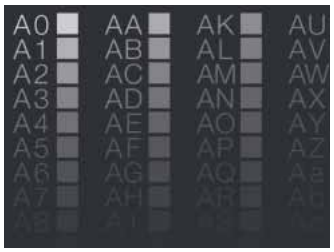
Traditional laser marker
There is only one focal point. The height of the head or that of the marking area should be adjusted according to the workpiece.



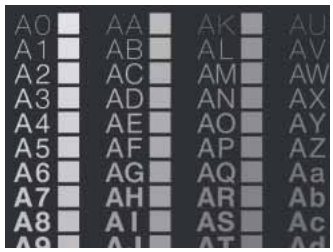
MD-V9900A Series
The focal point can be adjusted without changing the height of the laser head or that of the workpiece if the marking area is within the focal length (within ±21 mm).

Variable spot sample marking function

In addition to the traditional combination of laser power, marking speed and Q-switch frequency, the variable spot sample marking function features a useful feature that marks characters while changing the spot size (focal length). The best marking condition can be determined from the marking results. Even novices can find the best marking condition quickly for difficult mark settings such as shallow marking on electronics components (resins) or black marking on tools (metals).



Traditional sample marking function
The spot size is fixed. Only the laser power, marking speed and Q-switch frequency can be set.



Variable spot sample marking function
In addition to the traditional functions, it is possible to set various conditions while changing the spot size.

Multiple guide laser beams

The Marking Builder 2 software is equipped with a multiple guide laser beam function that allows for easy alignment of target marks. Choose to project the entire marking area, the exact position of each mark, or the shape of the target workpiece. Utilizing the guide lasers will ensure your marks will never be out of position again.

Frame of the marking area
(An area where characters could be marked is displayed.)

Image of a target workpiece
(The outline of a marking target is displayed.)

One or continuous guide laser beam radiation
(Characters to be marked are displayed.)

Marking areas
(Marking areas are displayed.)

Accelerate automation processes with our ...

Built-in power monitor (Patent pending)

Along with a system to verify the output value of the laser, the MD-V9900A also employs an internal system to monitor and automatically adjust for power variations that may occur over the lifetime of the laser. This feature will help to ensure that each mark is made with the same quality and consistency, regardless of the operator or age of the marking head.

Advantages of the built-in power monitor

- **Automatic power measurement and correction**
- **Quick measurement without moving equipment**
- **No variation caused by individual operators**
- **No change in accuracy over long-term use.**

External equipment connection

Follow-up marking on a rotating workpiece

Characters or logos can be marked while following a rotating workpiece. Rotation does not have to be stopped. Not only is the complex control simplified, but the follow-up marking function also improves the quality and significantly reduces tact time.

+ Servo motor with positioning function

MV Series

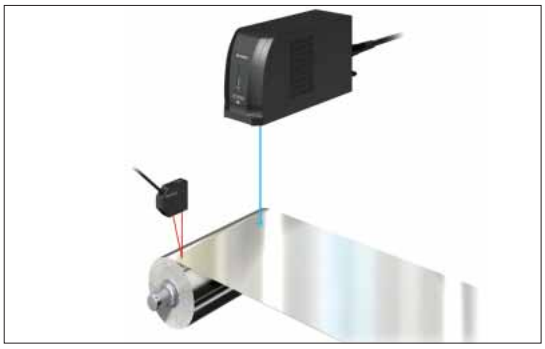
Micrometer

Adjusting the mark according to a change in distance

Change in distance to a target workpiece is perceived in real time by receiving an analog output. The LK-G Series helps to mark characters while varying the focal length.

+ High speed and high accuracy CCD laser displacement sensor

LK-G Series



Automatic marking of barcode information

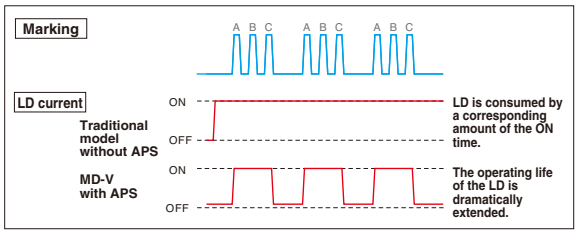
Data read with a barcode reader can be transferred to the laser marker without using external control devices such as a PLC or a PC.

+ Ultra-compact 2D barcode reader

SR Series

Automatic power-saving function

The MD-V9900A Series is equipped with the Auto Power-saving function (APS), which automatically lowers the current level of the LD light source when not marking characters. The power is not turned off but only set to a lower current level. This enables the system to return to marking mode instantly.



Configure the marking settings in any work environment

A new 8.4 inch liquid crystal touch panel is available. This 8.4 inch liquid crystal touch panel can be used at a worksite where it is difficult to install a personal computer. Additionally, a commercially available monitor and mouse enable the same operation as using the touch panel.

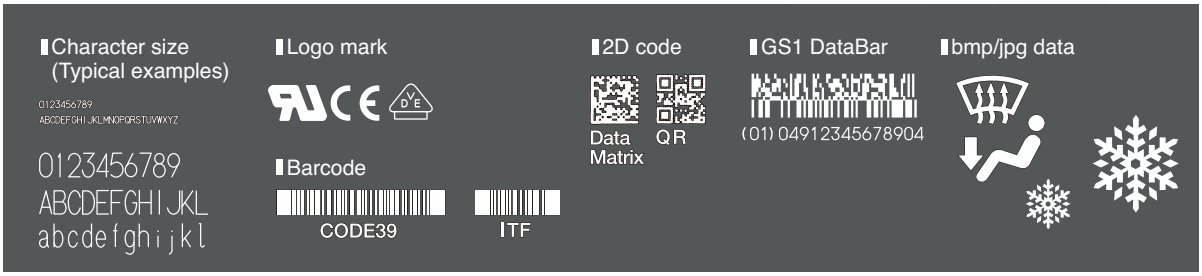
Touch panel console
MC-P1 (Optional)

A commercially available monitor and a mouse support the MD-V9900A operation.

Compatibility with earlier models

The MD-V9900A Series has compatibility with the earlier KEYENCE models MD-V9600 and MD-H9800 in many ways such as the focal length, marking fonts, data compatibility and more. The traditional models can be easily replaced with the MD-V9900A Series.

Marking samples



Safety precautions

- Before using the laser marker, be sure to refer to the User's Manual for thorough knowledge of the contents.
- Do not allow your eyes or skin to be exposed to a directly irradiated laser beam or a diffused reflection laser beam.

Specifications

			MD-V9900A (wavelength: 1064 nm)		
			Standard model	Standard model/Viewfinder	Wide area model
Model [1.]	Main unit (controller + marking head)		MD-V9900WA	MD-V9910WA	MD-V9920WA
	Laser marker setting software (MARKING BUILDER2)		MB-H2D2/MB-H3D2 Supported OS [2.]：Windows 7/Vista/XP(SP2 or higher version)/2000(SP4 or higher version), Languages: Japanese, English, Chinese and German [3.]		
	Laser marker setting software (Logo designer)		MB-HLD Supported OS [2.]：Windows 7/Vista/XP(SP2 or higher version)/2000(SP4 or higher version), Languages: Japanese, English, Chinese and German [3.]		
	Laser marker setting software (Z-MAP Creator)		MB-HZM Supported OS [2.]：Windows 7/Vista/XP(SP2 or higher version)/2000(SP4 or higher version), Languages: Japanese, English, Chinese and German [3.]		
	Console		MC-P1		
Marking style			XYZ 3-Axis simultaneous scanning method		
Marking laser			YVO_4 laser (Class 4 IEC60825-1)		
	Wavelength		1064 nm		
	Average output		13 W		
Q-switch frequency			CW (continuous wave), 1 to 400 kHz		
Guide laser / working distance pointer			Semiconductor laser (class 2), wavelength: 655 nm		
Marking area			120 x 120 x 42 mm		300 x 300 x 42 mm
Basic working distance (± variation width)			189 mm (±21 mm)		300 mm (±21 mm)
Marking resolution			2 μm		5 μm
Scan speed			12000 mm/s max.		8000 mm/s max.
Character type	Font		KEYENCE original font (numerical value, alphabet, katakana, hiragana and kanji) / user font / true type font		
	Barcode		CODE39 / ITF / 2of5 / NW7 (CODABAR) / JAN / CODE128		
	2D code		QR code / micro QR code / DataMatrix (ECC200/GS1 DataMatrix)		
	GS1 DataBar		GS1 DataBar/GS1 DataBar CC-A/GS1 DataBar Stacked/GS1 DataBar Stacked CC-A/GS1 DataBar Limited/GS1 DataBar Limited CC-A		
	Logo image		Custom font, logo (CAD) data BMP / JPEG / PNG / TIF		
	Laser cutting		Fixed point / straight line / dashed line / circle / oval		
Marking conditions	Marking style		Stationary marking / movement marking (constant speed / encoder)		
	Character size (height / width)		0.1 to 120 mm		0.1 to 300 mm
	Program	Registered programs	2000 settings max.		
		Number of blocks	256 blocks		
Input / Output			Terminal block input and output / MIL connector input and output		
Interface			RS-232C/RS-422A/USB2.0 [4.]		
CF memory card slot			Dedicated for CF memory card [5.]		
Marking unit installation direction			All directions		
Marking unit cable length			5 m		
Cooling method			Forced air cooling		
Supply voltage			100 to 120 VAC, 700 VA max. 50/60 Hz		
			200 to 240 VAC, 800 VA max. 50/60 Hz		
Environmental resistance	Ambient temperature for storage		–10 to +60°C, No condensation		
	Ambient temperature for usage		0 to 40°C		
	Relative humidity for usage		30 to 85%, No condensation		
Weight	Controller		23.0 kg	23.2 kg	23.0 kg
	Marking head unit		11.5 kg	11.8 kg	11.5 kg
	Console		2.0 kg		

1. For FDA compatible models and specifications, please contact your nearest sales office.
2. For Windows 7/Vista,the 32 bit and 64 bit versions are available. For Windows XP/2000,only the 32 bit version is available.
3. Simplified Chinese is supported. Chinese cannot be input. Windows is the registered trademark of Microsoft.
4. Port dedicated for PC software
5. Recommended manufacturer: SanDisk

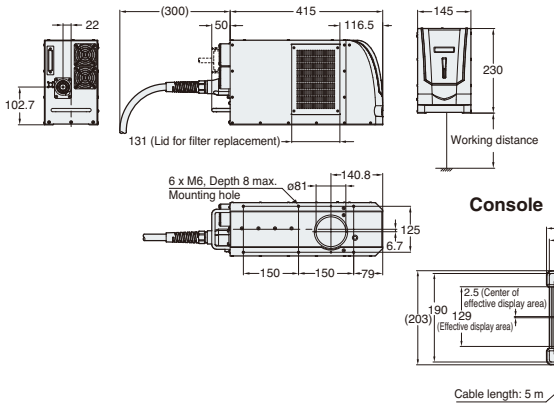
PC software specifications

Model		Description
Marking Builder 2 (2D)	MB-H2D2	2D setting and editing software (focal length / inclination correction / variable spot / distance pointer adjustment)
Marking Builder 2 (3D) [6.]	MB-H3D2	3D setting and editing software (marking on flat surface, cylinder, circular cone and sphere / Z-axis movement marking)
Logo designer [6.]	MB-HLD	Tool that converts DXF files into logo or extended character files that are editable.
Z-MAP Creator [6.]	MB-HZM	Tool that converts 3D-CAD files (STL format) into Z-MAP files.

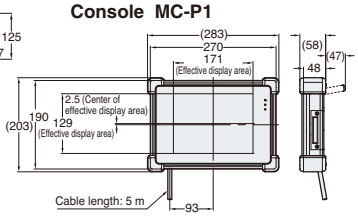
6. A USB hard key is required when installing Marking Builder 2(2D).

Dimensions

Marking head unit MD-V9900WA/MD-V9910WA/MD-V9920WA

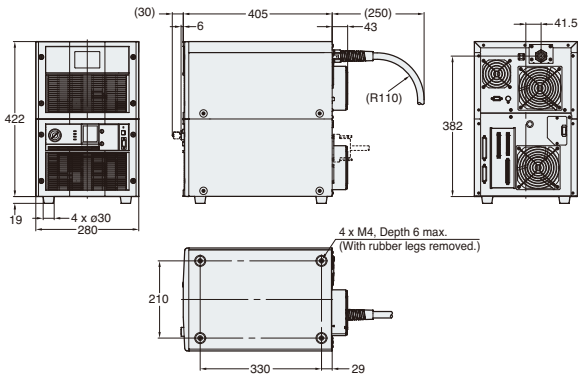


Console MC-P1



Controller

Unit: mm



KEYENCE

Please visit: www.keyence.com

SAFETY INFORMATION
Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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