

Trendsetting – the benchmark in technology and design

→ → **TYREX™ - LASER**

Unmatched compactness throughout the international market

The lasermarker for industrial high-performance applications

- For precise and permanent marking of all commonly used materials, including micro-areas
- Ideal for production integration applications as being available
- Broad spectrum of application by optional selection of wave range 532 or 1064 nm
- Portable, turnkey design ensures rapid set-up and operation
- Plug'n Mark – thanks to the user-friendly, in-house operating system Visual Laser Write
- Minimal operating costs through economical power consumption and an overall system that needs practically no maintenance

Miniaturizing ensured by worldwide patented technologies



TYREX™ - Laser.
Innovative. Powerful. Reliable.

 **COMPACT
LASER
SOLUTIONS**



→ TYREX™ - LASER

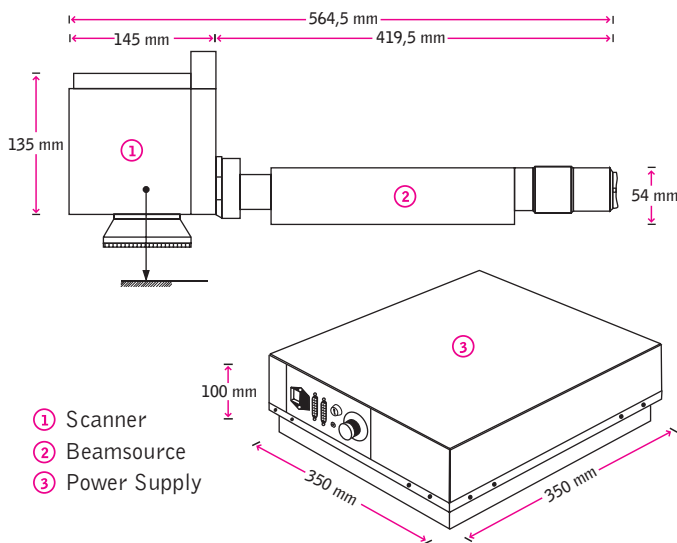
TYREX™, with its unexcelled laser-beam characteristics, is an extremely compact, purely air-cooled laser system for the non-contact and permanent marking of product components. Its miniaturized technology is unmatched throughout the international market. TYREX™ produces extremely powerful peak pulse output, as a result of pulse widths of only a few nanoseconds. This takes place of course in the system basic mode (with Gauss-similar intensity distribution in the beam cross-section), but with beam quality near the theoretically feasible maximum.

The innovative resonator design of the TYREX™ naturally also offers the possibility of producing frequency-doubled respectively beam emission in UV range. Outstanding beam quality and beam characteristics enable conversion efficiency up to 70%. The energy of the T-laser here lies within the range of 1- 3.5 mJ, at pulse repetition rates of several kHz. The combination of its powerful output with great efficiency and extremely compact laser dimensions allow new application concepts and new fields of application. Exemplary is the etching of super-fine structures in glass, with quality and production output not achieved heretofore. The extraordinary characteristics of the laser mean enhancement by several factors in productivity for a great number of application areas.

Some examples of areas the system strives for due to its extremely powerful peak pulse output:

- Surface structuring and trimming in semiconductor production
- Scribing and cutting of wafers
- Cutting of diamonds
- Drilling and deep engraving of metal components
- Marking of transparent materials and glass subsurface etching (3D)

The air-cooled laser source enables small dimensions in the marking unit, with resulting simple integration in systems with limited installation space. Typical applications result for completely automatic production lines with high cycle rates.



Technical Data

TYREX™ - Laser

Laser source

Laser typ	Diode-pumped, Q-switched Nd: YAG laser (optional: Nd: YLF; Nd: YVO ₂)
Wavelength range	532 nm/1064 nm
Pulse repetition rate	5 Hz - 50 kHz; optional 100 kHz
Pulse duration	apprx. 10 ns - 20 ns (depends on crystal material used, Wavelength and Frequency)
Peak pulse power	80 - 250 kW; optional max. 500 kW (depends on crystal material used, Wavelength and Frequency)
Modes	Basic mode (TEM ₀₀)
Laser class	4
Cooling system	Entirely air cooled

Marking head

Focusing lens	F-theta 163 Flat Field Lens (optional F-Theta 100, 254, 420)
Marking field (mm)	45 x 45 up to 280 x 280
Focus diameter	min. 20 µm (optional 10 µm)
Pilot Laser	Visible, red-beam pilot laser for easy positioning

Control unit

Electrical ratings	110 ... 240 V (10%), 16 A, 50 ... 60 Hz
Typical power consumption	<500W
Computer	Operating system model and type supplied at manufacturers' discretion WINDOWS® 98; NT; 2000 or XP*
Interface	RS422/485
System weight	Min. 15 kg, according to equipment provided

Date of most recent modification: April 2004. We reserve the right to make technical modifications without prior notice. Errors and omissions excepted.

*WINDOWS® is a registered trademark of the Microsoft Corporation, USA

Visual Laser Write Software (VLW)

- Graphic-oriented marking software under WINDOWS® (98, NT, 2000, XP)*
- Simple import of bitmaps created by image-processing programs, vector graphics, and drawings
- Automatic generation of date, time of day, and production shifts, in variable formats
- Comprehensive bar-code library and data-matrix code ECC 000-ECC 200 contained in the standard version
- User-friendly flow-chart principle
- Sixteen user-programmable digital inputs and outputs (8 each)
- Adjustment of marking parameters by software (power output, rate, frequency)
- RS 422/485 interfaces for industrial data transfer
- All TrueType fonts, vector fonts, Style Line; Chinese, Korean, Japanese, and Hebrew fonts
- Graphical elements (circles, rectangles, lines)
- Circular marking and free rotation
- Optional selection of language version: German, English, Spanish, and others.
- Open program architecture for individual script programming