Printing capabilities of CO$_2$ laser coders

Marking and coding

The compact CO$_2$ laser delivers permanent, high quality product coding (text, variable data, logos, 1 and 2D barcodes) for the food, beverage, pharmaceutical and personal care industries.

Performance

Versatility – Customer requirements vary depending on substrate type, code format and production rate. In order to address every customer need, there are 2 types of coding (patented dot matrix and scribing laser, both allowing stationary and on the fly coding), 3 power versions (10, 30 and 120 W) and 2 wavelengths (10.6 and 9.3 µm).

Message – Multi-line from 1 mm up to 155 mm in height.

Print speed – Up to 5 m/sec.

Alphabets and fonts – Numerous alphabets available like Chinese, Arabic, Hebrew, Cyrillic, etc. Strokes, Optical Character Recognition (OCR) A and B and dot matrix fonts.

Substrates – Printing on a wide variety of substrates such as PET, inked paper, painted metals or glass.

markem·imaje

the team to trust
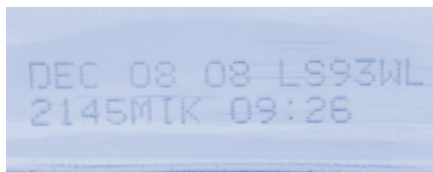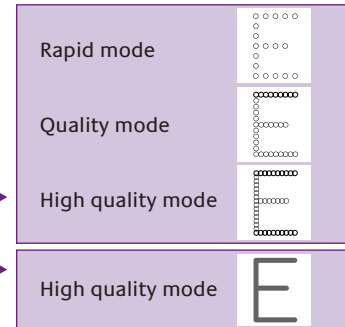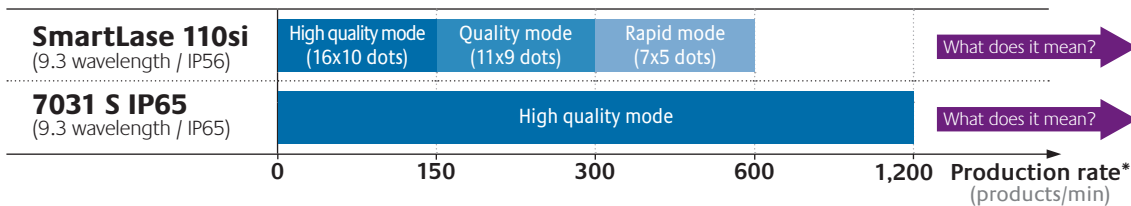
Selection of the most suitable laser ▪ ▪ ▪

The following calculations are focused on target applications. Higher performance can be obtained with less demanding coding requirements. Other substrates can be considered as well.

PET substrates ▪ ▪ ▪

The SmartLase 110si and 7031 S have been engineered with a specific 9.3 µm wavelength allowing for enhanced contrast coding on PET. Regardless of variations in product position on the conveyor (+/- 10 mm with fd 175 lens 120 x 120 mm), coding quality remains constant. Both SmartLase 110si and 7031 S require less energy and reduce risk of bottle piercing and miss prints on the fastest lines thus increasing productivity.
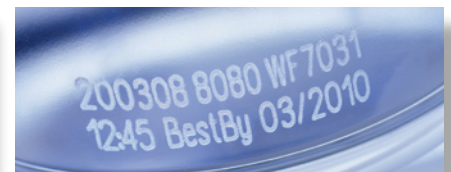
Coding requirements

- **Message format: 2 lines up to 34 digits**
- **Character height: 3 mm (0.12 inches)**
- **Line speed: up to 1.5 m/s (4.92 feet/s)**
- **Ambient temperature: up to 40°C (104°F)**

SmartLase 110si (9.3 wavelength / IP56)	High quality mode (16x10 dots)	Quality mode (11x9 dots)	Rapid mode (7x5 dots)		What does it mean? ➤
7031 S IP65 (9.3 wavelength / IP65)	High quality mode				What does it mean? ➤

0	150	300	600	1,200

Production rate* (products/min)

| Rapid mode |
| Quality mode |
| High quality mode |
| High quality mode |

SmartLase 110si
Dot matrix laser
Rapid mode (7x5 dots)

SmartLase 110si
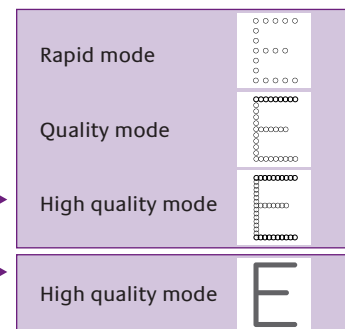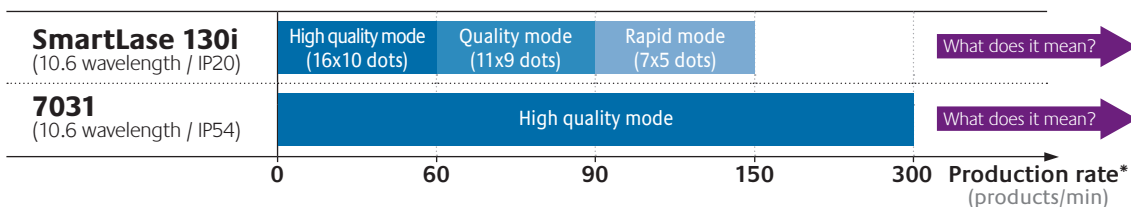Dot matrix laser
Quality mode (11x9 dots)

7031 S
Scribing laser
High quality mode (stroke fonts)
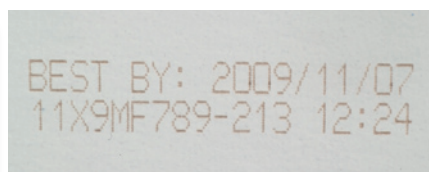
White paper substrates ▪ ▪ ▪

SmartLase 130i and 7031 are perfectly fit for coding on white paper substrates. 30 W versions are preferred when coding on white paper because higher energy is required to deliver contrasted code.
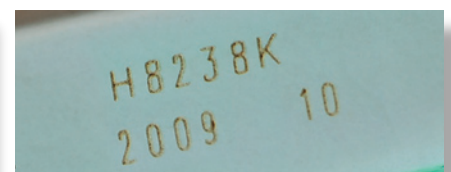
Coding requirements

- **Message format: 2 lines up to 20 digits**
- **Character height: 3 mm (0.12 inches)**
- **Line speed: up to 0.5 m/s (1.64 feet/s)**
- **Ambient temperature: up to 40°C (104°F)**

SmartLase 130i (10.6 wavelength / IP20)	High quality mode (16x10 dots)	Quality mode (11x9 dots)	Rapid mode (7x5 dots)		What does it mean? ➤
7031 (10.6 wavelength / IP54)	High quality mode				What does it mean? ➤

0	60	90	150	300

Production rate* (products/min)

| Rapid mode |
| Quality mode |
| High quality mode |
| High quality mode |

SmartLase 130i
Dot matrix laser
Rapid mode (7x5 dots)

SmartLase 130i
Dot matrix laser
Quality mode (11x9 dots)

7031
Scribing laser
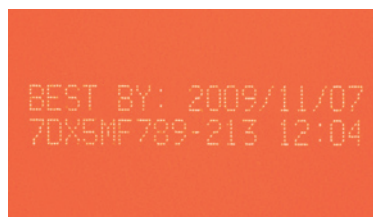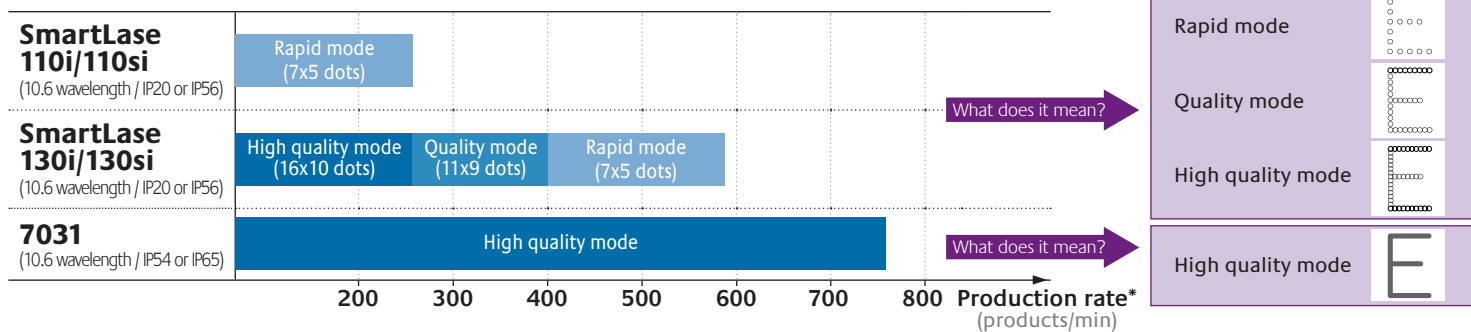High quality mode (stroke fonts)

* **Maximum laser duty**: 90%

Inked paper substrates ■ ■ ■

SmartLase, 7031 and Lightjet Vector are perfect for coding on inked paper substrates given their ink layer ablation process. The choice between the 3 products will depend on coding requirements: message format, paper substrate, level of quality and production rate. In line with ISO15415 standards, the quality of the Datamatrix code is optimal.

Coding requirements

- **Message format: 2 lines up to 20 digits**
- **Line speed: up to 1.5 m/s (4.92 feet/s)**
- **Character height: 3 mm (0.12 inches)**
- **Ambient temperature: up to 40°C (104°F)**

SmartLase 110i/110si
(10.6 wavelength / IP20 or IP56)
- Rapid mode (7x5 dots)

SmartLase 130i/130si
(10.6 wavelength / IP20 or IP56)
- High quality mode (16x10 dots)
- Quality mode (11x9 dots)
- Rapid mode (7x5 dots)

7031
(10.6 wavelength / IP54 or IP65)
- High quality mode

Production rate* (products/min): 200 300 400 500 600 700 800

What does it mean?
- Rapid mode
- Quality mode
- High quality mode

What does it mean?
- High quality mode

SmartLase 110i
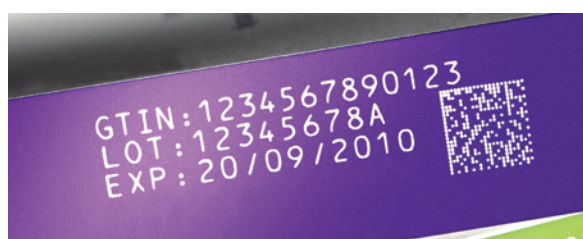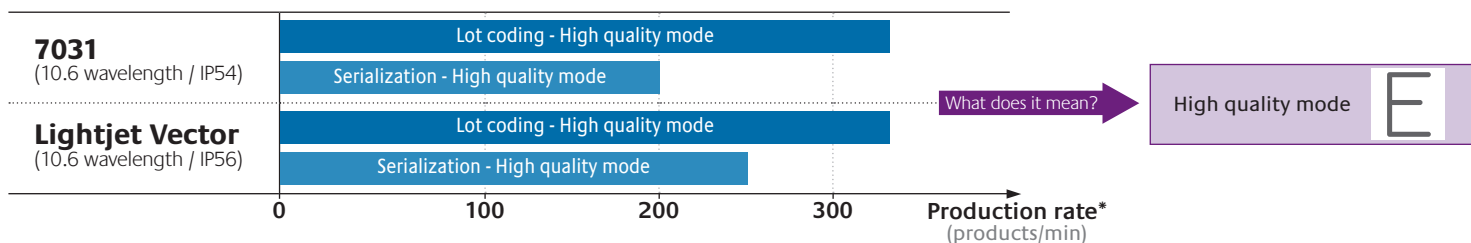Dot matrix laser
Rapid mode (7x5 dots)

SmartLase 110i
Dot matrix laser
Quality mode (11x9 dots)

7031
Scribing laser
High quality mode (stroke fonts)

Coding requirements

- **Message format**
  - Lot coding: 3 lines up to 40 digits and Datamatrix 22x22
  - Serialization coding: 4 lines up to 60 digits and Datamatrix 24x24
- **Character height: 2 mm (0.08 inches)**
- **Line speed: up to 1 m/s (3.28 feet/s)**
- **Ambient temperature: up to 40°C (104°F)**

7031
(10.6 wavelength / IP54)
- Lot coding - High quality mode
- Serialization - High quality mode

Lightjet Vector
(10.6 wavelength / IP56)
- Lot coding - High quality mode
- Serialization - High quality mode

Production rate* (products/min): 0 100 200 300

What does it mean?
- High quality mode

7031
Scribing laser
Lot coding (OCR B fonts)

Lightjet Vector
Scribing laser
Serialization coding (stroke font, Datamatrix 16x16)
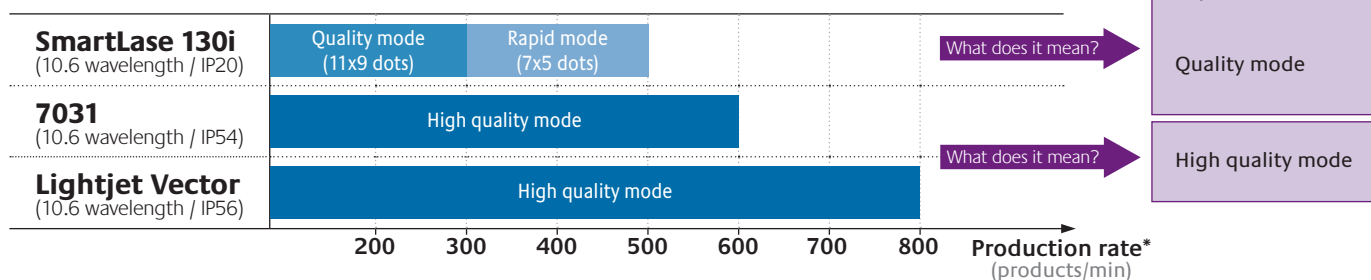
* Maximum laser duty: 90% (50% on Lightjet Vector)

Glass ■ ■ ■

SmartLase 130i, 7031 and Lightjet Vector are suitable for permanent coding on glass substrates. The choice between the 3 products will depend on coding requirements: message format, level of quality and production rate. Depending on glass type and microcracking effect, code contrast may vary. Optimal performances are achieved with fd 100 lens 70 x 70 mm and a lower pulse frequency (5 KHz 7031).

Coding requirements

- Message format: 1 line up to 15 digits
- Character height: 3 mm (0.12 inches)
- Line speed: up to 1.0 m/s (3.28 feet/s)
- Ambient temperature: up to 40°C (104°F)

SmartLase 130i
(10.6 wavelength / IP20)
— Quality mode (11x9 dots) / Rapid mode (7x5 dots)

What does it mean?

Rapid mode

Quality mode

7031
(10.6 wavelength / IP54)
— High quality mode

What does it mean?

High quality mode

Lightjet Vector
(10.6 wavelength / IP56)
— High quality mode

200 300 400 500 600 700 800

Production rate*
(products/min)

SmartLase 130i
Dot matrix laser
Rapid mode (7x5 dots)

7031
Scribing laser
High quality mode (stroke fonts)

Lightjet Vector
Scribing laser
High quality mode (stroke fonts)

* **Maximum laser duty**: 90%

Product comparison ■ ■ ■

	SmartLase 110	SmartLase 130	7031	Lightjet Vector
Fonts	Dot matrix	Dot matrix	Scribing and OCR	Scribing and OCR
Datamatrix	Yes, with CoLOS	Yes, with CoLOS	Yes, including serialization	Yes, including serialization
9.3 μm wavelength option	Yes	No	Yes	Yes
IP rating	IP20 (IP56 head version available)	IP20 (IP56 head version available)	IP54 (IP65 head version available)	IP56
Standard lens focal distance and coding area (mm)	fd 127 / 51 x 80		fd 150 / 105 x 105	fd 150 / 105 x 105
Optional lenses focal distances (mm)	fd 76 fd 102 fd 190	fd 76 fd 102 fd 190 fd 254	fd 100 fd 175 fd 200 fd 225	fd 100 fd 200
Ethernet	Optional	Optional	Standard	Optional

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