



Freudenberg produces customized special seals of up to 12 m in diameter for heavy industry. The engraving laser marks sealing rings clearly, forgery-proof, and permanently to ensure traceability and correct correlation. © Freudenberg Sealing Technologies

Engraving Laser for High-Tech Seals in Heavy Industry

Laser Engraving against False Labeling

Freudenberg Sealing Technologies manufactures industrial rotary seals with diameters of up to 12 meters and engraves them with important technical information for their customers. Moreover, engraving protects both customer and manufacturer against damage due to poor-quality imitation seals. A mobile engraving laser marks the rings precisely, quickly, and economically.

Freudenberg Sealing Technologies (FST) is a business group of the Freudenberg SE, an international, family-run technology company with headquarters in Weinheim, Germany. Almost 50,000 employees at 650 worldwide locations develop and produce a wide variety of creative technical solutions. One of the best-known inventions of the company, which was founded in 1849, is the 'Simmerring', a shaft sealing ring for innumerable applications in mechanical

devices. At their plant in Hamburg, Germany, more than 300 FST employees develop and produce a wide range of seals for heavy industry. The large dimension seals find application in, for example, wind turbines, shipping, steel works, or in mining. Since 2021, FST has employed a Quasar 20 engraving laser manufactured by Mobil-Mark, located in Ulm, Germany, to mark rotary seals up to 12 meters in diameter for clear, forgery-proof, and permanent identification (**Title figure**).

Laser Engraving also Helps against Counterfeit Seals

FST's graduate engineer Dipl.-Ing. Bernd Baas explains the need for engraving: "In addition to top quality and reliable service times in operation, our customers request individual, permanent, and easily legible markings to ensure correct positioning in the installation space, for instance." Traceability of the product to FST is an additional reason for marking –



Fig. 1. The Quasar 20 can be operated without personal protection equipment. This minimizes effort and expense to the user.

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Fig. 2. In a few seconds, the Quasar 20 applies a crisp logo and, for example, the batch or part number. © Freudenberg Sealing Technologies

especially in view of the proliferation of poor-quality counterfeit seals. "When a counterfeit seal fails, the missing engraving is proof that it is not a Freudenberg product."

Although the seals mass-produced by FST can be marked directly in the vulcanization tool, that would not be economical for small series and individual solutions. Prior to using the mobile engraving laser from Mobil-Mark, XXL elastomer seals were marked by labor-intensive manual engraving. Factors such as penetration depth and precision could not, however, be completely reproduced, and manual work was cost-intensive.

Dipl.-Ing. Georgios Deftsiotis, a project leader in FST's process technology department, says, "We were looking for a mobile and flexible laser engraving solution that gives excellent engraving results, and is easy to apply. Above all, the device had to have a very low protection classification, so that it could be readily used in different production stations." After intensive searching, the seal specialists took their specified requirements to Mobil-Mark and found what they were looking for: the Quasar 20 engraving laser with 20 W fiber laser power and certified for a laser class that requires no personal protective equip-

ment for operators (Fig. 1). For the laser engraving to work perfectly reliably with the specified labeling parameters in every application, Daftsiotis, together with a Mobil-Mark specialist, developed an ideal solution: They designed an individual user interface that rules out operating errors. For instance, the particular operator only has to scan a barcode of the seal to be marked, and all required parameters – such as marking content and laser power – are automatically retrieved from an individually structured data bank.

Crisp Marking in Ten Seconds

When applied in practice, FST's laser engraving works like this: The seal to be marked is placed in a template adapted to its profile contour. The laser head with optical sealing unit is placed manually on the workpiece and triggered by the press of a button. As soon as the laser is securely seated, it gives a green light for engraving. Once the start button has been pressed, an additional red light shines until the engraving procedure is completed, which is the case in about ten seconds. The result is a crisp marking which may include, for example, the batch number, part number, assembly note, and further individual information (Fig. 2).

After a year of laser engraving with the fiber laser from Mobil-Mark, Baas and Daftsiotis draw a positive conclusion. "The high quality of engraving, crisp typeface, intuitively obvious, user-friendly functionality, mobile configuration, and fast production cycle of the Mobil-Mark Quasar 20 has fulfilled our requirements perfectly," says Baas. "The engraving results conform precisely to our uncompromising product quality." ■

Info

Text

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