

Improving on perfection: The quick replaceable MAURER® Safety Ingold Socket

By taking a new approach, the long-established Swiss company Edelstahl Maurer AG has succeeded in developing the reliable, welded-in safety Ingold socket into a component that offers a uniquely high level of flexibility with regard to operations and maintenance, and meets the highest safety requirements – thanks to these properties, it helps significantly boost efficiency and productivity. With the patented invention of the MAURER® Quick Replaceable Safety Socket, Edelstahl Maurer AG offers its partners in the process engineering and, in particular, the bioprocess engineering industry effective protection against large losses such as long production shutdowns.

The MAURER® Quick Replaceable Safety Socket is an innovative product that offers a range of key advantages over conventional, welded-in safety Ingold sockets:

High operational flexibility: The MAURER® Quick Replaceable Safety Socket can be replaced at any time with another adapter or a special customer-specific socket – including with non-standard formats. This means that disruptions can be greatly reduced and – in addition to the advantages offered by an unrivaled level of flexibility – productivity can be boosted.

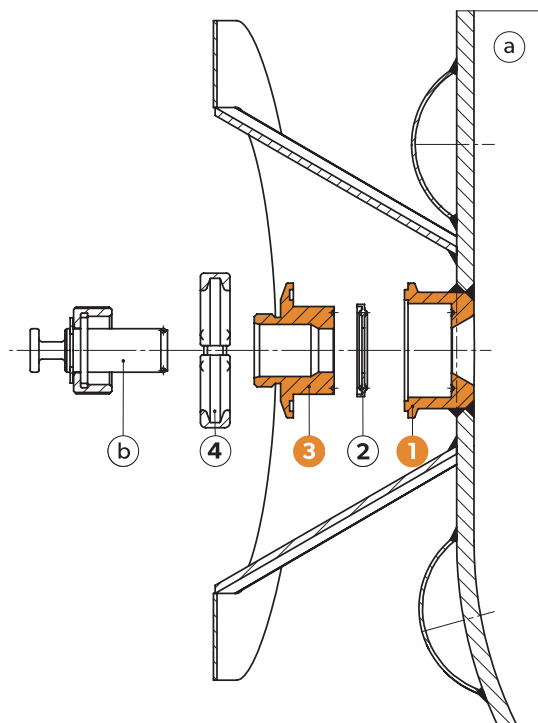
Shortest possible production shutdowns: Until now, damage caused to a safety Ingold socket has inevitably resulted in a long production shutdown and considerable costs. This horror scenario for process manufacturing plants, above all those working with biotechnology applications, has now become a thing of the past.

Optimum sealing, roundness and finish: Conventional sockets have to be reamed in stages manually after welding to the tolerance of 25 H7. The components of the MAURER® Quick Replaceable Safety Socket are perfectly manufactured and, from the factory, they comply with the tolerances for

optimum surface quality and roundness. In addition, the O-ring of the blind plug or retractable assembly seals the entire 25 H7 hole evenly. The optimum surface quality ($R_a \leq 0.10 \mu\text{m}$) also results in much less friction on the O-ring during the assembly process.

Quick, easy, tool-free: The newly developed MAURER® Quick Replaceable Safety Socket can be replaced quickly, easily and without using tools. It offers significant benefits when compared with conventional welded-in safety Ingold sockets as it is not always possible to avoid defects in Ingold sockets, even if they are handled with care. If a conventional welded Ingold socket has to be replaced, the inevitable consequence is a long production shutdown. The MAURER® Quick Replaceable Safety Socket, on the other hand, can be replaced very quickly and without complex and time-consuming work on the product vessel.





Structure of the MAURER® Quick Replaceable Safety Socket unit

- ① MAURER® weld-in block flange (0° or 15°)
- ② Standard Tri-Clamp seal with lip
- ③ MAURER® replaceable safety Ingold socket unit
- ④ Standard Tri-Clamp safety clamp
- ⑤ Process chamber
- ⑥ Safety Ingold blind plug

What inspired you to further develop the reliable Ingold socket?

Emanuel Maurer: The need for a solution was brought to us by the industry in August 2019, and this challenged our innovative strength. At that time, a multinational biotech company from our customer base asked us whether we could develop a flexible, replaceable Ingold socket comprising as few individual parts as possible that would be easy to use, robust and durable, and could ideally be replaced without tools. Since a component of this kind was not available worldwide as standard, we developed it entirely from scratch.

Your solution is impressive – can you take us through the journey from the inquiry to the now patented product?

Emanuel Maurer: The breakthrough was the conceptual idea – an Ingold socket with a circumferential, beveled flange with a positive-locking tongue-

and-groove connection precisely centered in the welded-in block flange and fixed with a clamping device. This remarkably simple solution with a single component meets all the requirements set for us. During the product development stage, we conducted intensive research, pursued various solutions, designed more than 40 versions, and completed extensive test series. This allowed us to develop the product to perfection, not least because we not only wanted to fulfill the basic requirements, but were also keen to create an innovation that offers added value on several levels. The entire development process through to the granting of the patent took five years.

Can you already share any practical experience with the new product?

Emanuel Maurer: Yes, of course – for example, four years ago, we removed several welded-in Ingold sockets from a 5,000-liter process vessel, retrofitting it

with the new MAURER® Quick Replaceable Safety Socket for the original customer. This process vessel has been in operation ever since and will continue to be used for the foreseeable future, and fully meets our customer's expectations. In practice, it has also been shown that our MAURER® Quick Replaceable Safety Socket also offers major advantages in cases where adapter units with different formats are to be used, e.g. measuring and control devices with non-standard formats. What is also very attractive about this product is the virtually unlimited possibilities of integrating functional devices directly into the socket unit in the future.

Emanuel Maurer

Managing Director of Edelstahl Maurer AG for 30 years

Inventor of the MAURER® Quick Replaceable Safety Socket

Ensuring maximum safety: The MAURER® Mechanical Safety Device

Another innovation of Edeltahl Maurer AG guarantees maximum safety: The newly developed mechanical locking solution perfectly complements the MAURER® Quick Replaceable Safety Socket, provides an extra layer of safety, and provides protection against faults and the resulting costly damage, such as product loss or shutdowns.

The MAURER® Mechanical Safety Device is fitted after the blind plug or a retractable assembly on the union nut of the safety Ingold socket and prevents the union nut from accidentally coming loose or twisting – an additional safety seal can be used if required. The safety device still has its protective effect even if the union nut has not been correctly tightened, for example as a result of errors made during the assembly procedure or vibration in the production process. This is because the adapter cannot loosen any further.

- Quick and easy assembly
- Significant and cost-effective increase in production safety
- Developed for use with the MAURER® Quick Replaceable Safety Socket



The company

Edeltahl Maurer AG is a medium-sized, owner-run family business that specializes in the development, design, manufacturing, assembly, and commissioning of process engineering systems, equipment, and machinery. The company has a reputation for exemplary quality, high reliability, and tremendous know-how in both engineering and manufacturing.

Edeltahl Maurer AG is a leading manufacturer of high-quality pressure vessels – specifically MAURER® API/ADC freeze-thaw vessels – synonymous with superb workmanship and a first-class finish. Since the company was founded out in 1988, they have made over 3,600 vessel units for delivery worldwide. Their customers are mainly buyers in the pharmaceuticals and biotechnology industries.

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References

The MAURER® Quick Replaceable Safety Socket is protected by US Patent No. 12,111,184 and European Patent No. 4 088 090 – patents pending in India, Singapore, China and Japan.