

CASTING ONLINE MAGAZINE

C.O.M.



Die-cast Aluminium Alloys for Structural Components of Vehicles with Electric Drive

Release agents and plunger lubricants for die casting process

Choosing the Right Vacuum Impregnation Program

In 60 seconds from the casting machine to the cleaned chassis part

Release agents and plunger lubricants for die casting process

Barbara Bastian

Tribo-Chemie GmbH has been successfully distributing release agents, plunger lubricants, pastes and other auxiliary materials in Germany, Europe, and the world for decades. The combination of suitable die casting release agents, plunger lubricants and other auxiliaries for Al/Mg and Zn high pressure die casting not only enable various savings potentials by optimized application of the operating materials, but also qualitatively improved castings.



“The right choice of plunger lubricant and other auxiliaries can positively influence casting quality and permanently reduce costs”.

Fine-particle release agent emulsions without wax content from the product portfolio of Tribo-Chemie GmbH provide die casters with a high degree of flexibility during the casting process, as these emulsions can be used conventionally, in reduced quantities and even in micro-quantities. The right choice of plunger lubricant and other auxiliaries can positively influence casting quality and permanently reduce costs.

Release Agents

The wax-free release agent series Isolat® TT 77 and Isolat® Enviro 1011 are well established in the market for years and are known for their unproblematic application. Deposits in spray systems, spray heads and on die casting moulds are not an issue.

The caster is urged to take a close look at his processes in order to achieve the ideal and precise spray application. The increasingly sophisticated die cast parts with high demands on surfaces, accuracy, and the downstream processes (from painting and welding to a wide variety of joining techniques) require precision-fit die casting processes.

The advantage of these wax-free, water-miscible Isolat® release agent series (**Fig. 1**) from Tribo-Chemie is that these fine-particle emulsions can be sprayed highly diluted with water, slightly pre-diluted or even pure.



Fig. 1: Water-miscible Isolat® release agent (Source: Tribo Chemie)

The more concentrated the release is to be applied, the more finely composed the release emulsion must be in order to ensure smooth application by means of fine misting nozzles. This optimized application can be laid out for the production of a casting in a minimum/low-volume or micro-spray process.

Minimal/reduced quantity or micro-spraying undoubtedly has the potential to revolutionize the die casting technology in the coming years. In this application technique, release agent emulsions pure or in low dilution ratios or water-free release oils, are finely atomized and sprayed on the die surfaces in minute quantities.



“Micro-spraying undoubtedly has the potential to revolutionize the die casting technology in the coming years”.

By eliminating the external cooling, the thermal alternating stress on the mould surface is significantly reduced, which can counteract premature aging of the tool steel. A number of advantages can result from a complete changeover to this technology: Shortening of cycle times, extension of mould lifetime, minimization of wastewater, and others. However, such a changeover is associated with considerable investment, e.g., special spraying technology, special mould design for minimum/reduced quantity/micro-spraying, high-performance cooling/heating systems, so that the desired temperature balance of the mould can also be ensured. A possible reduction in cycle time inevitably requires an adaptation of the peripheral equipment, such as e.g., part-removal robots.

This kind of complex alteration of an existing production process involves an increased investment risk, especially for small and medium-sized foundries. To achieve the desired economic advantage, the rule of thumb is to reduce the cycle time by at least 10% while significantly extending the mould lifetime.

In the meantime, a quite pragmatic approach has been adopted in the industry: With the help of the flexibly usable die casting release agents, spray applications are optimized and reduced as best as possible, and when designing new moulds, they are designed from the very beginning to be suitable for minimal-/micro spraying.

To simplify the micro-/minimal quantity spray application for the foundrymen, ready-for-use products are offered, such as the water-based Isolat® MMS series or a highly effective release oil, Isolat® UP 100, which can also be applied at die temperatures above the Leidenfrost phenomenon (**Fig. 2**).



Fig. 2: Semi-synthetic liquid with an extremely powerful release



Fig. 3: Available grain sizes Isolat® 80 G (Source: Tribo Chemie GmbH)

Plunger/Piston Lubricants

Often the plunger lubricant is only discussed when the casting shows quality defects. Tribo-Chemie offers a wide range of different plunger lubricants.

The dry lubricants Isolat® 80 G and the commercially interesting type Isolat® 70 G are worldwide known beads (pellets) with a high graphite content which, after the rapid melting of the carrier material, builds up an excellent lubricating film by capillary action for the protection of plunger and shoot sleeve (Fig. 3).

The graphite know-how acquired over many decades has been incorporated into the product design of not only the „beads“, but also the oil-based piston lubricants. The graphite content is stably dispersed and does not settle out over months.

The graphite-containing plunger oil Isolat® KS 955 is ideally suitable for spraying, which ensures a precise, clean, and quantity-reduced application.



“The graphite content is stably dispersed and does not settle out over months”.

In addition to graphite-containing plunger lubricating oils, Tribo-Chemie’s product portfolio naturally also includes graphite-free plunger lubricants that can be sprayed, pressed, dripped or even applied by brush.

Auxiliary Materials

Start-up pastes, known as silver paste (Isolat® TM 201, Fig. 4) or anti-soldering grease (Isolat® Trewa SF), are part of the standard range, but modern users are increasingly impressed by the start-up oil Isolat® UP 78, which can be applied manually or automatically and thus in a controlled manner by means of a spraying device and which clearly exceeds the reach of a brush, but above all reduces the start-up parts. Attention should also be paid to the innovative, temperature-resistant coatings and other special products that are used not only to protect runners, ladles, crucibles or furnaces. Particularly noteworthy are a water-based, sprayable coating called Isolat® Coate Hydro (Fig. 5) and an oil-based coating called Isolat® Coate S-8.



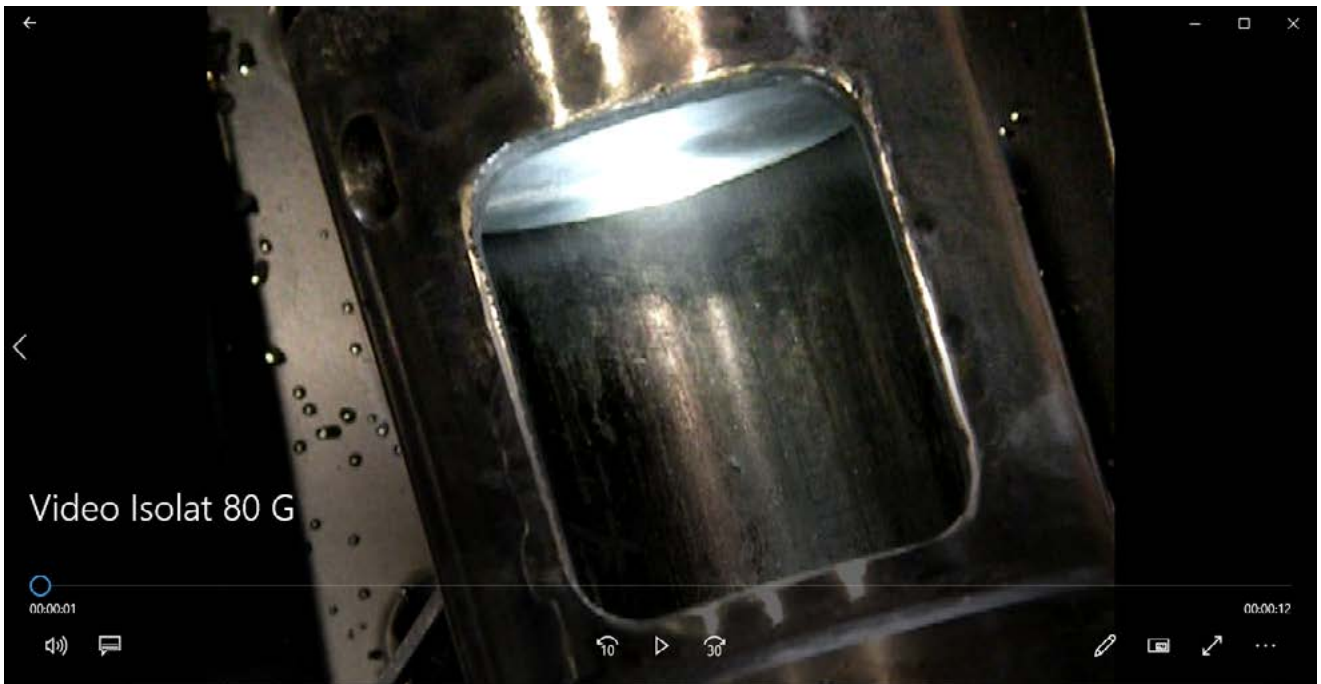
Fig. 4: Start-up pastes, known as silver paste Isolat® TM 201 (Source Tribo Chemie GmbH)



Fig. 5: Sprayable coating called Isolat® Coate Hydro (Source Tribo Chemie GmbH)



Video competitor beads



Video Isolat 80 G

The videos show the structure of the lubricating film with Isolat® 80 G (below) and with a plunger lubricant from a competitor (above),
Source: Tribo Chemie GmbH

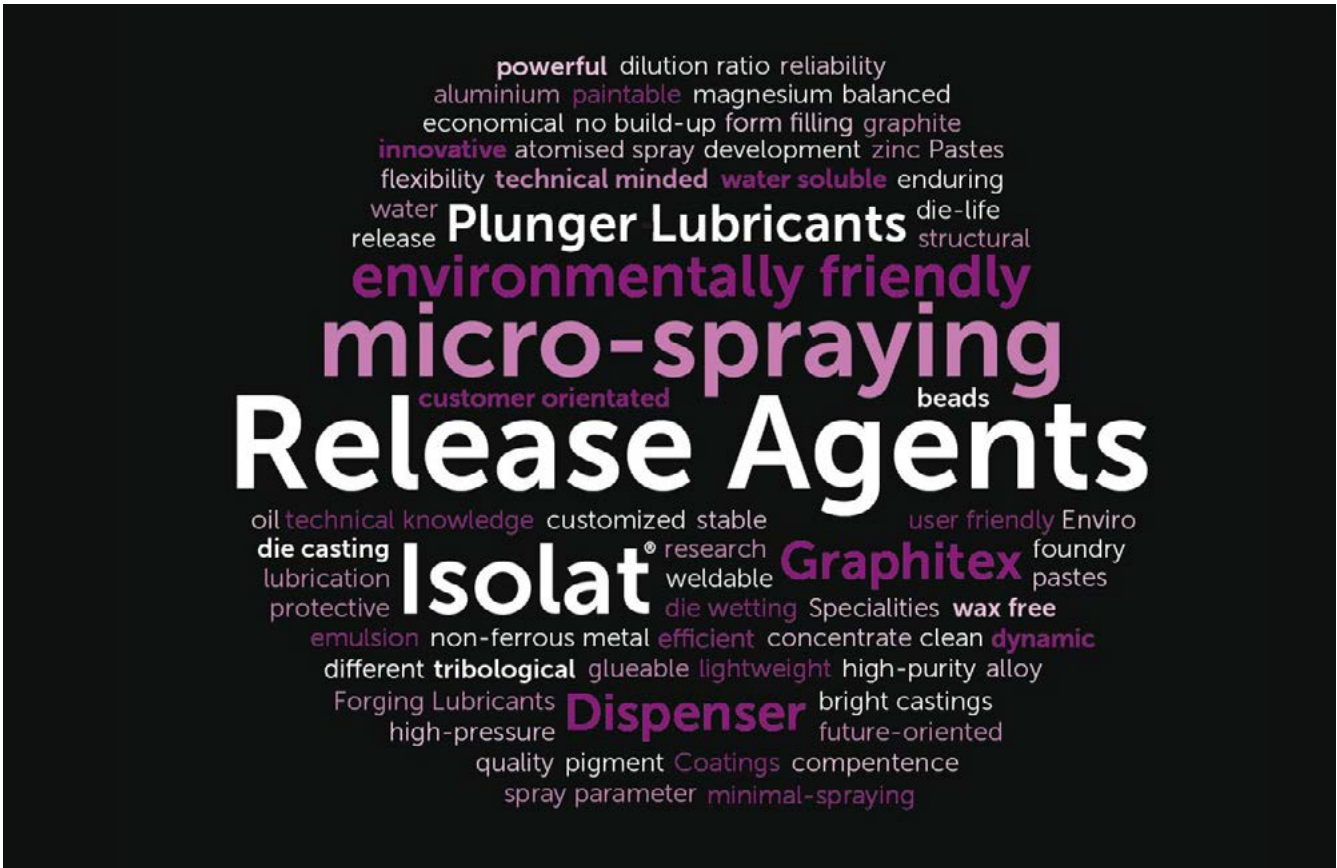


Bild: Release Agents Wordcloud


About Tribo-Chemie GmbH:

As a manufacturer of release agents, plunger lubricants and auxiliary materials for die casting of Al, Mg and Zn as well as lubricants for the forging industry, our goal is to place the right product with the customer. We advise and support the customer in such a way that the use of a Tribo-Chemie product gives them not only an economic but also a technological advantage.

Increasingly complex die castings require not only technically accompanied trials at the customer, but often customer-specific solutions. Based on the manufacturing equipment developed over many years and a dynamic formulation know-how, challenges are mastered together.



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Mastering new challenges together.

We go with you every demanding trail.
We are prepared for everything and for every situation
we have the perfect solution.

ISOLAT[®] release agents for lightweight casting solutions.

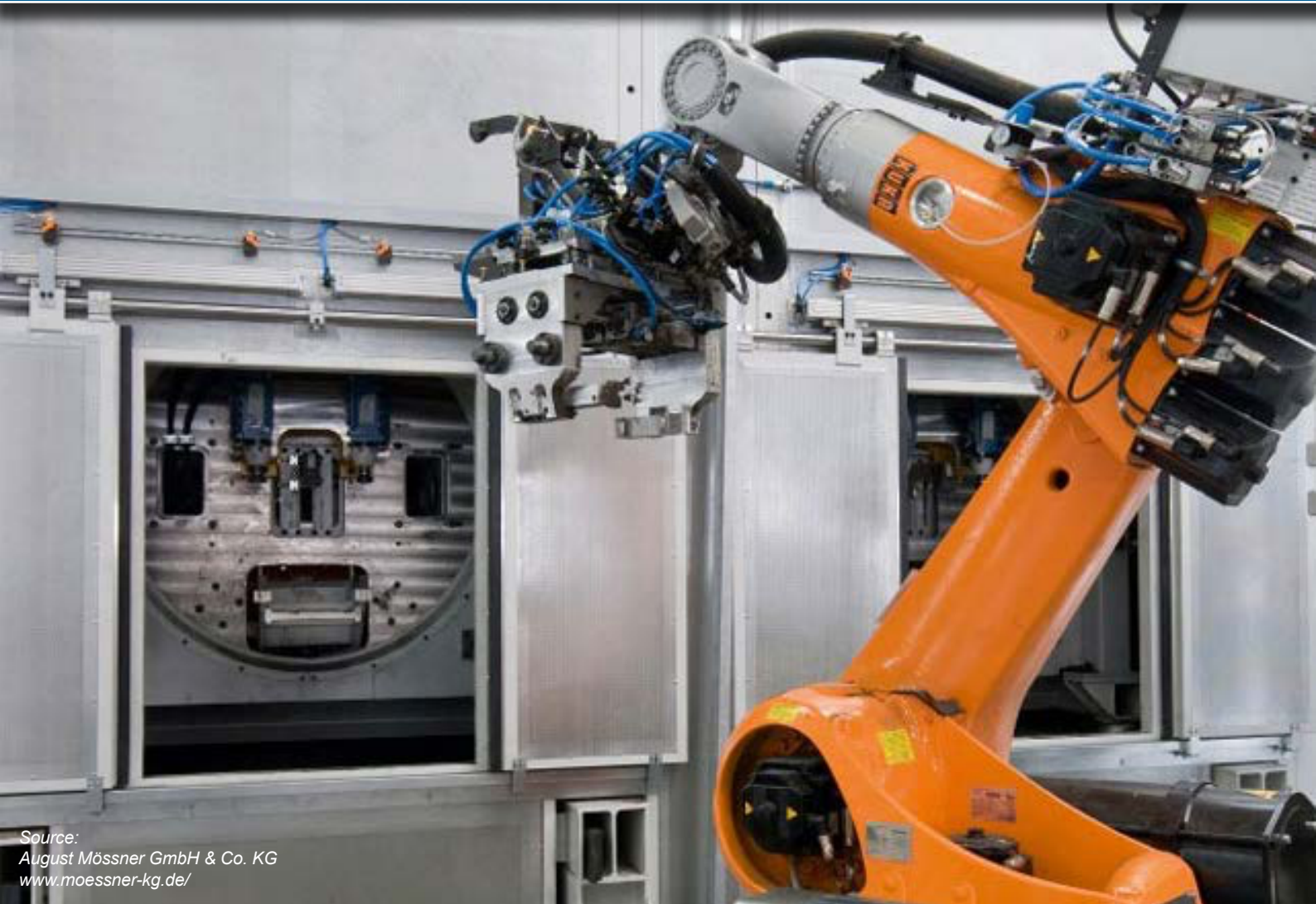
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