

EXHIBIT

2031



[Request Free Consultation](#)

JUMP TO:

- [Conventional Release Agents](#)
- [Semi-Permanent Release Agents](#)
- [Silicone-Free Release Agents](#)
- [Water-based, Solvent-based, and Carrier-free Release Agents](#)
- [True value](#)
- [Maximized productivity](#)
- [Proven sustainability](#)
- [Related News](#)
- [Related Brochures](#)

Let us find a solution for you.

[SOLUTIONS FINDER](#)

JUMP TO:

- [Conventional Release Agents](#)
- [Semi-Permanent Release Agents](#)
- [Silicone-Free Release Agents](#)
- [Water-based, Solvent-based, and Carrier-free Release Agents](#)
- [True value](#)
- [Maximized productivity](#)
- [Proven sustainability](#)
- [Related News](#)
- [Related Brochures](#)

Global leaders in mold release agents and application expertise.

Release agents are an integral part of many manufacturing processes. Specialty mold release agents can help you enhance productivity, extend tool/die/mold life, increase cycle times, improve part/surface quality, and reduce scrap and defect rates, along with many other potential benefits.

Our mission is to improve your process by tailoring our advanced release solutions for your specific application. Our mold release agents are designed to drive value in your operation, simplify your process, and eliminate challenging common molding problems that can cost you time and money.

We work closely with you and your team to not only introduce the best release technology for your process, but also provide ongoing support and training for operators to ensure your continued success.

Sustainability starts with innovation in our mold release agents.

Our commitment to [sustainability](#) is integral to manufacturing our mold release agents, ensuring environmentally responsible development practices while upholding superior performance. [Contact Us](#) With a focus on reducing waste and emissions, Chem-Trend's release agent solutions support industry achievement of greener



We offer a broad portfolio of conventional (apply-every-cycle) mold release solutions to meet the needs of our customers. Our conventional (sacrificial) options are:

- Available water-based or solvent-based
- Formulated as ready-to-use or dilutable, depending on the application
- Suitable for multiple types of spray equipment
- Capable of “tailored” dilution rates, depending upon the application and amount of slip required
- Excellent for molded parts with very complex geometry
- Exceptionally low in in-mold buildup/mold fouling

Semi-Permanent Release Agents

This category is reactive with the mold surface, chemically adhering to it while also providing a chemical and physical release barrier. Molders can leverage several potential advantages with today’s highly sophisticated water-based or solvent-based semi-permanent mold release technologies. Semi-permanent mold release technology has provided a viable alternative to the traditional “shop-spray” or high-volume, apply-every-cycle release agent. Our customers have experienced:

- More mold releases between applications than conventional release solutions
- More molding cycles attained per working shift
- Smaller amount of product needed per application, contributing to a cleaner working environment with fewer storage needs
- Reduction in overall scrap
- Extension in mold up-time due to enhanced mold protection properties provided
- Supports production of complex part/mold structures due to ease in application exactness
- Improved cosmetic appearance of molded parts

To see our Semi-Permanent Release Agents for Rubber, [click here](#).

To see our Semi-Permanent Release Systems for Composites, [click here](#).

Silicone-Free Release Agents

Always on the cusp on innovation and sustainability, Chem-Trend has developed a robust range of release solutions that do not utilize silicone. Silicone-free formulations provide several benefits:

- Reduces oily residue, allowing for easier painting and coating post-release
- Reduces contamination risk
- Removes costly and time-consuming steps in the manufacturing process, thereby increasing productivity and lowering operational cost

To view our innovations in silicone-free release agents for the aerospace industry, [Contact Us](#) [click here](#).



Water-based

Advances in water-based solutions have made them a highly viable option for many applications. Their active components are emulsified into water as the active compounds generally are not water soluble. This category of release solution is more environmentally friendly due to having reduced or no VOCs (volatile organic compounds) with zero flammability and fewer fumes emitted. However, technology and manufacturing techniques are more complex in order to provide a stable emulsion and good film formation, particularly at room temperature. Often, this category is presented in a form that can be diluted. Water-based solutions are also required to be biologically stable and robust.

Solvent-based

The main benefits of traditional solvent-based formulations are their effectiveness in releasing molded parts and long service life. The active principles of solvent-based formulations are dissolved or dispersed in a solvent or blend of solvents. The choice of solvent influences the dispersion quality, film formation, and evaporation rate. This category of release solution lends itself not only to heated molds, but also to room temperature application. Many operators are choosing water-based formulations due to the Health, Safety, and Environment (HSE) impact of solvents.

Carrier-free

Carrier-free solutions are usually solid release agents in powder form. Application is often done using an electrostatic spray gun. Film is formed upon contact with the heated surface similar to powder coatings.

Explore your options with a Chem-Trend expert. [Request a free consultation.](#)

Why should you choose Chem-Trend release agents?

True value



Creating value for you, our customer, is our focus. Formulated to optimize your daily operations, our industry-leading line of release agents includes water-based and solvent-based products as well as silicone and silicone-free products in semi-permanent or apply-every-cycle products. Our solutions can help you overcome costly manufacturing challenges — and leveraging the power that release solutions offer to improve operational efficiencies and product quality.

Maximized productivity

[Contact Us](#)



Chem-Trend offers a wide variety of release options suited to address your specific needs and maximize your results. Every molding process is unique in some way, and optimal release requires unique solutions. Our team of localized experts takes a hands-on approach, working with you to identify all areas of potential improvement. Our research and development team then designs individualized solutions for your operation.

Proven sustainability



Many of our customers are working diligently to make their operations more sustainable. They choose Chem-Trend because we've been focused on minimizing the environmental impact of our products since we began. We developed the first commercially viable water-based die lubricant in the 1960s, which had an immensely positive impact on the health and safety aspects of die cast facilities by removing the use of graphite and/or solvents in the die lubricants that were widely used at that time. Continual efforts extend to a variety of other environmental impact concerns, including the use of VOCs in solvent-based mold release agents. Today Chem-Trend leads the industry in the development of [innovative solutions](#).

Find a Release Agent with our [Solution Finder](#) or [Contact Us](#) today.

NEWS

[**Michigan-Based Company Introduces Game-Changing Solution for Release Agent Dilution**](#)

[**Chem-Trend to expand research and development facilities at global headquarters**](#)

BROCHURES

[**FAQs: Release Agents**](#)

Looking for answers about release agents for thermoplastics processing applications? Learn more about frequently asked questions and the answers you need.

[Contact Us](#)

FAQ



from sticking to mold surfaces during the molding process. They provide a water- or solvent-based chemical barrier between the mold and the product or part being created. The type of release solution used depends on a variety of factors, including the material that the mold is made from, the material that is being molded, and specific requirements of the manufacturing process.

Are release agents needed for silicone molds?

The need for a release agent in silicone molding production depends on a few factors. For instance, if the silicone mold being used has self-releasing, non-stick properties, a release product might not be necessary. However, for molds that impart intricate details and textures, or a sleek, glossy finish, the right release solution can help maintain integrity and surface quality. One can also be useful depending on the material being molded – concrete and resin, for example, may be more prone to sticking than smoother materials. For manufacturers who want to extend the life of their molds, a release agent can reduce degradation of the mold over time.

Can mold release agents cause problems in post molding treatments?

In general, post mold treatment of surfaces can be adversely affected by the residual presence of release agents if the release agent is not compatible with such treatment or if it is present in excess on the released part surface. The choice of release agent chemistries compatible with post release operations, the adjustment of the application level onto the mold and the choice for low transferring release agents (like semi-permanent ones) can lead to successful post molding operations and minimize any part contamination issues.

How are release agents removed from resin?

Removing a release agent from resin parts usually requires industrial equipment and cleaners. Whether using a machine or cleaning manually, the goal is to remove all resin from the surface area. After the initial wash, resin parts should be thoroughly rinsed with clean water to remove all residues. Air drying systems are often used to completely dry all parts, but smaller volumes can be dried with a lint-free cloth. A final inspection should be performed to ensure all resin is gone. Taking safety precautions, including wearing PPE and ensuring proper ventilation, is essential. Regular cleaning and maintenance can help extend the life of equipment and lessen downtime in the long run.

How do the specific applications (composite, plastic, rubber, etc.) affect the type of mold release agent recommended?

In general, the release agent should not be chemically compatible with the material being molded: offering a good chemical and physical barrier preventing the molded compound from chemically interacting with the mold (substrate). It is the old adage “like dissolves like”, so if the release agent and material are too compatible, the material can penetrate the release agent film and adhere to the mold surface. The composition of the material being molded, as well physical characteristics like hardness and abrasion (often influenced by fillers and reinforcing agents), influence the choice of release agent. Different metal alloys, thermosets, thermoplastics and elastomeric materials have different molding processes and conditions which demand different requirements from the release agent, affecting mold release selection.

How rapidly is the industry moving away from solvent based mold release agents and towards water based mold release agents?

[Contact Us](#)

The shift greatly depends on the industry and process requirements. Several industries no longer tolerate solvent-based products due to health, safety and environment concerns or other regulatory issues. Industries



Water-based products are more sensitive to application (offering more challenges to film formation) and have slower evaporation rates (which can be influenced by the application method, process conditions and environment humidity levels) than solvent based products. Water-based products are more prone to cause chemical interaction of residual water remaining on the mold surface with the material being molded during the molding process (e.g. generation of urea byproducts in polyurethane molding). This category of release agents also requires more technology to ensure emulsion stability and bio-activity resistance. These challenges have to be addressed to expand the use of water based release agents across a wider range of industries.

How should non-aerosol release agent products be applied in thermoplastic processing operations?

Non-aerosol products are best applied in thermoplastic processing using a high quality spray gun or with clock-controlled spraying equipment.

How should the mold release agent be applied?

Application methodology depends on the carrier of choice as well as on the nature of the release agent and the process and process environment. Application is a key aspect to be observed and may significantly influence the performance of the release agent. In most cases, release agents are applied using a spray gun (manual or robot application). In some applications programmable spray systems with multiple spray nozzles allowing for the application of one or more release agents are used. The nozzle size is regulated to ensure proper atomization (influenced by the expected throughput and release agent viscosity) and good film formation. Spray application can be air assisted (where air is used to further shear and atomize droplets) or airless (where the nozzle operating at high pressure shears the release agent stream to obtain the necessary atomization). Electrostatic spray guns can also be used to apply solid and liquid release agents. In some applications, release agents can also be applied by aerosols or even through manual or automated wiping.

What are the advantages and disadvantages of each type of release agent?

Each type of agent has its own particular strengths and limitations. Here is a brief overview:

- **Solvent-based:**

- Strength: Easier to apply. The solvent carrier also helps with the film formation. The evaporation rate can be adjusted based on the solvent blend. The choice of solvent may ease the dissolution / dispersion of the agent's active ingredients.
- Limitation: Not highly environmentally friendly. Offer higher health (VOC's) and safety concerns (fire hazards) than non-solvent based products.

- **Water-based:**

- Strength: Environmentally friendly and presents no fire hazards. May sometimes be dilutable (can be shipped as concentrates). They can be used to cool the die if necessary. May be developed with a level of technology that ensures mold release performance equivalent with solvent based formulations.
- Limitation: Require more complex technology to manufacture. Proper film formation can be more challenging. This category of release agents may be more prone to stability issues and biological attack. Water-based agents have slower evaporation rates than their solvent based counterparts and may not be appropriate for some room temperature molding operations or operations with short cycle times. Residual water onto the mold may affect molding performance (entrapped steam) or even chemically react with the material being molded. The latter is particularly an issue when molding polyurethane parts.

- **Carrier-free:**

[Contact Us](#)



free release agents may also require additional modifications to the molding equipment to ensure thermal balancing of the mold. These factors often limit the application of this category of release solutions.

- **Sacrificial:**

- Strength: Easy to apply. Require less application technique and offer more tolerance of work (less dependent on trained operators).
- Limitation: The release agent film on the mold surface is in great part depleted after each molding cycle and needs to be replenished. It also tends to build up on the mold if over applied. In general, the release coating is partly transferred to the molded part, which may cause negative side effects on post molding operations (painting, adhesion, etc.) if applied in excess or if the agent chemistry is not compatible with the post molding operation. If water-based, tend to cool the mold, removing heat & energy from the system (this may represent a disadvantage if the process is not designed for that). The release agent film on the mold surface is in great part depleted after each molding cycle and needs to be replenished.

- **Semi-Permanent:**

- Strength: Require significantly lower application frequency than sacrificial release agents because the agent film lasts for multiple molding cycles (frequency depends on the process conditions). Allow for a more steady and continued production without interruption for application. There is very little transfer to the molded part, which allows for better post molding operations (coating, adhesion). The release solution can be reapplied regularly on the coated mold refreshing the film. This category provides an excellent combination of chemical and physical barriers, preventing build up and providing the desired release performance.
- Limitation: Requires more training of operators to ensure the right touch up frequency is observed. Molds need to be clean to allow for good interaction between the release agent and the mold surface during the initial application of the release agent.

- **Internal:**

- Strength: Reduce the need for external mold release agents.

Limitation: These are specialty chemicals that are embedded into the material being molded. Because they are generally chemically incompatible with material, they may continue to exude to the surface over time, compromising post molding operations (coating and adhesion) or the surface cosmetics of the part. Heat can accelerate this phenomenon. Often do not eliminate the need for external releasants as the internal mold release agents do not always migrate to the mold interface or may not ensure 100% release efficiency. Limited in their capability of performing high performance release agent functions such as affecting part surface characteristics.

What are the advantages and disadvantages of silicone-free versus silicone-containing release agents?

The advantage of silicone-containing release agents is that they offer a very good release effect. The disadvantage of silicone-containing release agents is that the subsequent treatment of the released parts, such as gluing or painting, may be difficult or even impossible. Additional post molding part processing will be required.

What are the different categories of release agents?

[Contact Us](#)

They can also be categorized based on how the mold release solution interacts with the process:



release solutions allow for multiple molding cycles before they have to be reapplied to the mold.

- **Internal Mold:** These are specialty chemicals that are embedded into the material being molded. Because they are generally chemically incompatible with the material, they tend to exude to the surface of the part during the molding process providing a release layer. Sometimes its migration mechanism to the surface can also be accelerated by heat.

What are the main functions of a mold release agent?

Mold release agents provide not only a physical and/or chemical barrier as the means of separation between the material being molded and the mold surface, but also impact process characteristics like the flow rate of the material being molded within the mold cavity, molding cycle time and, of course, release ease. The choice of mold release agents also affects finish characteristics of the released part like gloss level, accurate texture reproduction, post molding operations (e.g. adhesion or coating of the molded part) in addition to influencing the mold service life in between maintenance cycles, and overall productivity.

What factors need to be considered in selecting a mold release agent?

Factors to be considered for selecting the proper release agent include:

- Mold material / substrate
- Material being molded
- Process conditions:
 - Temperature
 - Line speed / cycle time
 - Pressure
 - Specific molding process such as injection molding, high pressure, gravity fill, compression, etc.
 - Process variable fluctuations
- Geometry of the mold
- Post molding operations (adhesion, coating)
- Expected performance level and productivity (number of good releases or good parts demolded per time period)
- Existing process issues (cavity filling challenges, soldering, release-related scrap rates, process condition fluctuations etc.)
- Mold maintenance expectations (mold cleaning frequency)
- Part finish requirements (gloss, marring, etc.)
- Application methodology
- Health Safety and Environmental (HSE) requirements

What is the advantage of using release agents from aerosol cans instead of non-aerosol products in thermoplastic processing operations?

The advantage of aerosol cans for thermoplastic processing is that the spray valve system allows the product to be applied very thin, consistently and with a predictable spray pattern. This allows material to be saved and prevents over application. Spray cans also offer easy handling and flexibility.

What happens if too much release agent is applied?

Applying too much release agent can make subsequent process treatment of the parts more difficult by creating an oily or slick surface on the molded part.

[Contact Us](#)



along the molding process, negatively affect molding performance in terms of heat transfer, part dimensional properties, cosmetic appearance and process efficiency. Mold cavity fouling needs to be regularly removed mechanically or chemically to ensure part quality. Every time the mold needs to be cleaned on-site or otherwise maintained, productivity is lost.

Build up issues can be created by two primary sources:

- **Excess of release agent present on the mold.** This may be the result of a poor choice of release agent for the specific application (e.g. not compatible with the process temperature) or over application of the release agent onto the mold.
- **Lack of release barrier causing build-up of the material being molded or byproducts and residues generated during the molding process.** In this case, the choice of release agent may not be adequate for the process conditions (not suitable for the process temperature, poor film formation, etc.). This may also be caused by application deficiencies (not enough release agent film present on the mold) or lack of physical and/ or chemical resistance of the release agent to the material which then penetrates the release agent film and physically or chemically adheres to the mold.

What technical trends are impacting the types of mold release agents offered for various end uses?

Industries are molding more exotic materials to produce parts with better performance under increasingly demanding conditions in which the finished products operate. These exotic materials are not always easy to mold. One good example comes from the automotive sector, where engine components (molded parts) are subject to chemical and physical challenges to withstand more aggressive operating conditions. As a result, newly developed, tougher materials (like fluoro-polymer based compounds), are required to be molded at high production rates with minimal scrap levels (given their higher unit formulation cost). This poses a challenge to the release agent industry, due to their chemical and physical properties which make them difficult to mold and release.

Part appearance has also become more demanding, and in many cases the parts are being used as molded with very minimal subsequent finishing done to the parts. The automotive industry requires that highly visible components like steering wheels or dashboards have exacting cosmetic properties (e.g. texture, gloss and marring resistance) directly following release.

In recent years high-pressure aluminum die casting has seen an increase in the complexity of the molds, with an increase in high integrity (semi-solid and squeeze) casting, as well as a reduction in cycle times and further increasing die temperatures. These factors require the release agent to provide improved anti-solder properties as well as better release and lubrication properties to produce quality parts under the more difficult casting conditions. This has to be achieved without compromising on other performance attributes of the release agent.

More complex and sophisticated mold designs are created for other industries as well, such as the low profile tires made by tire manufacturers. These mold designs place higher performance demands on the release agents with regard to release ease and rubber flow. The post molding appearance of tires is also critically important as well, resulting in significant challenges to easily release these types of tires while also achieving high appearance standards.

The use of lower VOC (volatile organic compound) products continues to be enforced by manufacturing facilities as a result of HSE regulations, being particularly important in processes that require higher direct involvement of operators, like in the composite segment. There will continue to be increased focus on developing products that are more environmental friendly and safer to use. This will stimulate new release agent

[Contact Us](#)



-  [Global](#)
-  [Brazil](#)
-  [India](#)
-  [Korea](#)
-  [China](#)

[Contact Us](#)



[YouTube](#)

© 2025 Chem-Trend L.P. or Chem-Trend affiliated company. All rights reserved.

Terms & Conditions

Privacy Policy

Cookie Policy

California Supply Chain Act

Canada Forced Label Report

Compliance/Whistleblowing

[Contact Us](#)

a brand of  **FREUDENBERG**



[Contact Us](#)