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CM-WP0367EN-12.2020

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# Synthetic Drawing & Forming Lubes

Free of mineral oils and eliminating cleaning steps.



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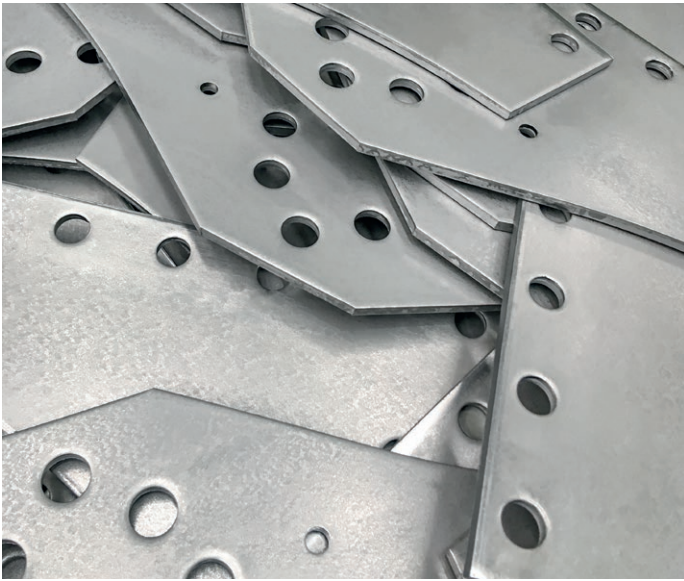
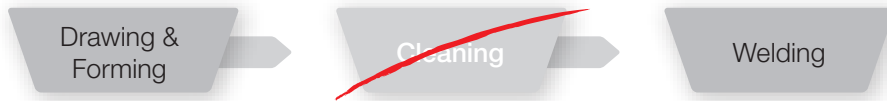
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# Synthetic Drawing & Forming Lubes



Moving away from a mineral oil-based lubricant to a mineral oil-free lubricant drawn parts offers multiple advantages: Leading metalworking technologies offer considerable savings potential to reduce cost per parts while at the same time can contribute to make the whole production more sustainable.



## Introduction

Many parts are made by drawing and forming as opposed to metal removal operations. In most of these applications, a lubricant is required to facilitate lubrication, heat dissipation and provide temporary corrosion protection. Lubrication supports the increase of tool life (dies) and reduces surface imperfections. Nearly all of the deformation energy is converted into heat, which needs to be dissipated in order to provide a constant process temperature. Typically for steel sheet the lubricant is expected to function as a corrosion preventive.

## Challenges and Solutions

In general, mineral oil-based lubes, both straight oils and water-based emulsions, are being used for these drawing and forming applications. These types of lubricants often lead to slippery floors, aerosol formation, increased maintenance of tooling and intensive cleaning operations of the parts for next process steps. The Surface Treatment global business unit of BASF's Coatings division, operating under the Chemetall brand, developed a product line which is water soluble, mineral oil-free and eliminates the drawbacks of the mineral oil-based lubricants.

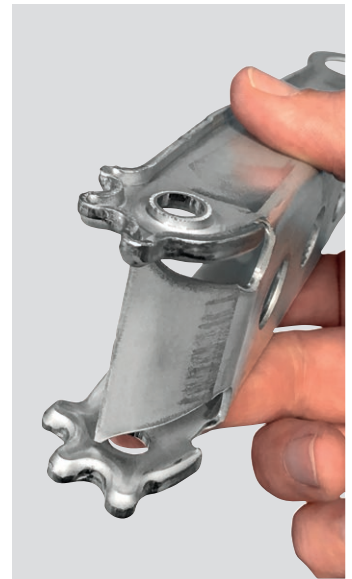
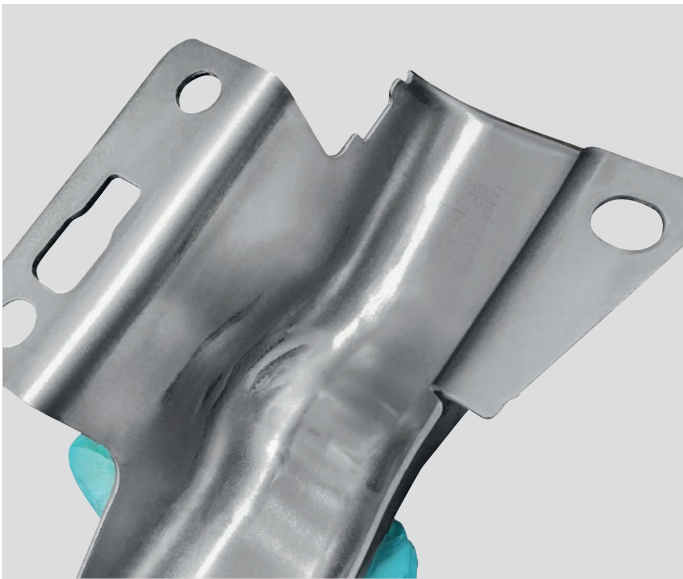
## Functionality

The product technology is based on an alkaline amine package combined with a selection of polymers. This technology provides a transparent solution and can be used from 4% to 100% concentration, depending on the lubrication level needed. Most common concentrations used are 12% and 24%, which are also available as ready-to-use products.

Apart from the standard technologies, the portfolio has been enhanced with a multi-metal drawing and forming product and a product with increased viscosity for arduous multistage drawing operations. The products can be run in circulation or applied by spraying or rolling. The minimum corrosion protection is three months indoor storage.

## Advantages for your processes

- + Eliminates cleaning step after drawing/stamping process
- + Ready for assembly
- + Suitable for hot dip galvanized and standard sheet metal
- + No use of mineral oil
- + A cleaner shop floor
- + No mineral oil aerosols
- + Improved health & safety (no hazardous labeling, burnt-oil fumes during welding)
- + Good corrosion protection
- + Similar or better tool life



### Advantages and Results

The cleaning step after the drawing and forming can be eliminated due to the low residual film of lubricant. This has a significant impact on the throughput time, temporary storage of parts and the total cost of operations. The remaining lubricant is compatible with the welding process and does not cause defects.

Customers observed an increase in die life occasionally from 10 to 40%. This can be explained by having improved temperature stability due to water's effective capabilities of heat dissipation. The maintenance of the dies has been perceived to be less cumbersome. Additionally, this technology improves health and safety by having no slippery floors, cleaner dies and no dripping parts. The environment in which operators work also improves by the elimination of mineral oil aerosols.

### Savings and Improvements

Elimination of the cleaning process reduces the cost per part and creates floor space. The need to store parts or maintain a cleaning bath area are eliminated.

In cases where the lifetime of the dies is extended, additional savings on costs per part are achieved. This can be significant saving, because the lubricant

costs are only a fraction of the costs of the dies. Maintaining the dies becomes easier and facilitates the die workshop. The financial gains vary depending on application and consumption rates, though the tooling engineer works with more pleasure.

The impact on the working environment is significant and there is simply no point of return to the mineral oil-based lubricants once this technology is introduced. The air quality is improved and the chance on accidents due to slippery floors is reduced. The outcome is a valuable and environmentally-sound production with a high working safety.

Occasionally, parts requiring different lubricants produced on the same production machine, do not need lubricant change anymore. By changing the concentration the necessary lubrication level is achieved, saving unnecessary downtime.