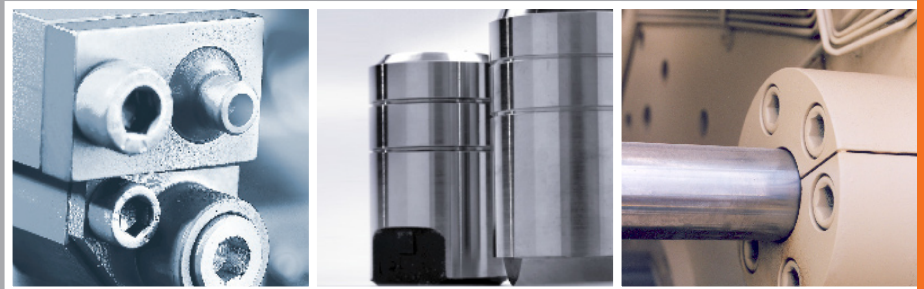


DIE LUBRICANTS | PLUNGER LUBRICANTS | ANCILLARY PRODUCTS



Innovative Process Solutions for  
the Die Casting Industry

# Chem-Trend Die Lubricants

Advanced Technologies. Advancing Productivity.



Aluminum Casting | Magnesium Casting | Zinc Casting | Semi-Solid Casting

## CHEM-TREND DIE LUBRICANTS

Chem-Trend die lubricants have been the industry standard of performance for almost fifty years. Our commitment to continuously advancing the performance of our technology has allowed Chem-Trend to offer high pressure die casters the most comprehensive product line of liquid and powdered die lubricants for aluminum, magnesium, zinc, squeeze and semi-solid casting operations. The demand for more complex castings and reduced processing times has led to the development of products that address the most difficult process requirements:

- High temperature die adhesion properties
- Cleaner, installation-ready parts
- Elimination of residues for better post-finishing and painting needs
- Reduced micro-porosity
- Improved insulation and laminar fill properties
- Environmentally-friendly products

Our ability to develop and support these innovative products didn't happen by accident. Our sales and technical experts have gained a broad scope of process technology from being where it's all happening – on the shop floor. In fact, day after day, year after year, you'll find Chem-Trend people in customer facilities partnering to maximize effectiveness and increase productivity.

Do you have a unique application that requires something more? Chem-Trend is a leader in custom formulated technology and can develop a product to meet your specific operating parameters.

## A STUDY IN DIE LUBRICANT PRODUCTIVITY

### New Die Lubricant Reduces Solder and Improves Productivity

#### Situation:

A leading die caster was making engine blocks with steel cylinder inserts on a 3500 T Ube® machine with a total cycle time of less than 120 seconds. They were getting good solder protection, with low overspray and in-cavity build-up with a die lubricant running at about 1:100 dilution. When they started casting a new engine design, they noticed solder formation near the water jacket area on the part. This required them to stop production and die polish for about 30 minutes once every 8 hours.

A competitor's attempts to solve the problem resulted in failure, giving rapid solder formation even at 1:50 dilution.

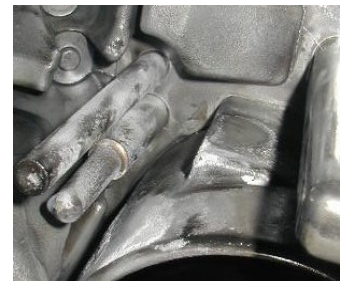
#### Solution:

Chem-Trend studied the tool design and took thermal images of the die before and after spray to monitor temperature profiles and spray distribution. The temperature ranged from 232°C to 399°C (450°F to 750°F) before spray on the ejector die. Observation revealed that the previous product was not covering the problem area adequately. A new Safety-Lube® product was engineered to provide better coverage and rapid film formation at the high temperatures seen on the die. The pictures below show the dramatic reduction in solder.

Old Product (After 8 hours)



New Product (After 8 hours)



#### Benefits:

The improved performance from the Safety-Lube® product eliminated the need to polish every shift and reduced the cleaning time by 50%.



## SAFETY-LUBE® DIE LUBRICANTS

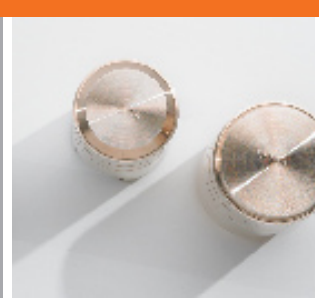
Chem-Trend offers an extensive range of die lubricant technology created to address the most demanding of die casting processes. The table below offers a sampling of our products and applications.

CASTING TYPE	TYPICAL APPLICATIONS	TYPICAL ALLOYS	DIE TEMPERATURE	PRODUCT BENEFITS
<b>Large Aluminium Castings</b>	Automobile power train components, engine blocks, transmission cases	A380, EN 46000 and EN 46100	250°C to 400°C (482°F to 752°F)	Excellent solder protection and release
<b>Long-flow Path Aluminium Castings</b>	Instrument panels, chair bases, radiators	EN 46000 and EN 46100	175°C to 350°C (347°F to 622°F)	Excellent metal flow and solder protection
<b>Mid-sized Complex Aluminium Castings</b>	Motorcycle components, heat sinks, motor components	ADC12, A380, A390	150°C to 300°C (302°F to 572°F)	Excellent metal flow and release
<b>Squeeze Castings</b>	Wheels, rocker arms, upper arms, engine mounts, brake housings, disc drive housings	A356 and A357	250°C to 300°C (482°F to 572°F)	Excellent temperature control and low porosity
<b>Magnesium Castings</b>	Mobile phones, laptop covers, steering wheels, handheld appliances	AZ91D, AM50, AM 60 and other newer alloys	150°C to 350°C (302°F to 662°F)	Excellent metal flow and surface quality
<b>Zinc Castings</b>	Automotive components, plumbing and housing fixtures, zippers	Zamak 3, Zamak 5	80°C to 250°C (176°F to 482°F)	Rapid release and excellent finish

\*These are general application references. Please consult your local Chem-Trend representative for specific application information and process parameters.

# Power-Lube® Plunger Lubricants

Highly Engineered Lubricants for the Most Demanding of Heat and Pressure Extremes.



Water-Based Lubricants | Oil-Based Lubricants | Pellet & Powder Lubricants

## POWER-LUBE® PLUNGER LUBRICANTS

Chem-Trend plunger lubricants keep things moving and production going. But if you're looking for the reasons that have made Power-Lube® Plunger Lubricants a leading product in the industry, it goes beyond just the physics of repetitive motion. A full line of water-based, oil-based and dry lubricants provide superior protection and longer life to shot sleeves and steel and copper beryllium plunger tips. In addition, reliable, consistent shot-to-shot profiles ensure part quality by reducing porosity. Power-Lube® plunger lubricants offer superior wetting and film building for maximum protection and can dramatically reduce the impact on the environment with reduced smoke and flame.

Power-Lube® lubricants are available in powders, pellets, liquids and graphite-free formulations allowing casters to realize:

- Consistent Shot and Better Part Quality
- Reduced Gas Inclusion/Reduced Porosity
- Increased Shot Component Life
- Reduced Smoke and Flame
- Cleaner Working Environment

As with all Chem-Trend products, Power-Lube® plunger lubricants have been developed by leading industry chemists and are backed by a worldwide network of experienced technicians who collectively bring a unique, global perspective to supporting customer needs.

## MAKING A CASE FOR POWER-LUBE® PRODUCTIVITY

### New Plunger Lubricant Is a 'Clear' Winner

#### Situation:

A North American die caster was concerned about the wastage and performance issues with their current pellet plunger lubricant. They have a number of machines ranging in size from 150 T to 900 T, with water cooled CopperBeryllium tips ranging from 60 mm to 100 mm (2.5" to 4"). The plant was experiencing:

- Build-up and wear on their tips
- Plugging in the vacuum system leading to porosity on critical parts
- Significant downtime each shift for housekeeping on the machine

#### Solution:

A trial was started with Power-Lube® 454, a new oil-based plunger lubricant, on a 350 T machine with a ~90 mm (3.5") tip and a ~711 mm (28") sleeve. 1.5 ml of lubricant was applied per shot. The plant noticed an immediate improvement in cleanliness around the shot end of the machine. After three weeks, there was no build-up in the vacuum system, machine or the tip. Tip life was improved and the number of shots per tip increased by 200%.



Comparison of Chem-Trend plunger lube tip (left) and the competitive product tip (right). Both tips have run for 2500 shots.

#### Benefits:

The improved productivity and savings in tip and sleeve life was estimated at over 20,000 euros per year. The customer was very pleased with the trial and converted all their machines to the new lubricant.



## POWER-LUBE® PLUNGER LUBRICANTS

Chem-Trend's Power-Lube® plunger lubricants play an integral part in producing high-quality castings worldwide. Look below to determine what product type might be best for your application process.

PRODUCT TYPES	FORM	TYPICAL PROPERTIES	APPLICATION METHOD	PRODUCT BENEFITS
<b>Oil-based Pigment Free</b>	Liquid	Viscosity @40°C (104°F) 50 to 950 cSt	Brush, drip or spray	Easy to apply and control, good lubrication
<b>Oil-based Pigmented</b>	Liquid	Viscosity @40°C (104°F) 300 to 3000 cSt	Brush or spray	Excellent lubrication
<b>Water-based</b>	Liquid	Viscosity @40°C (104°F) 100 to 1000 cSt	Drip or spray	Environmentally friendly
<b>Grease-based</b>	Paste	Penetration 130 to 170 dmm	Brush	Excellent lubrication
<b>Pellets</b>	Solid	0.5 to 3 mm nominal size. Melting points 50°C to 120°C (122°F to 248°F)	Pneumatic feeder	Excellent lubrication
<b>Powders</b>	Solid	< 1 mm nominal size Melting points 105°C to 130°C (221°F to 266°F)	Pneumatic feeder	Excellent lubrication

\*These are general application references. Please consult your local Chem-Trend representative for specific application information and process parameters.

# Metalstar™ and Wolfrakote® Ancillary Products

Covering Your Machine's Operation from Start to Finish.



Lubricants | Pastes | Fluids | Cleaners | Protectants | Coatings

## ANCILLARY LUBRICANT PRODUCTS

If it moves on your machine, Chem-Trend has a product to keep it functioning at peak efficiency. The smallest moving part left to the wrong product can bring an 800 ton machine to a standstill. That's why Metalstar™ and Wolfrakote® brand ancillary products are not afterthought products in the Chem-Trend portfolio. These have been formulated to help clean, protect and lubricant machines with the performance expectations of our die and plunger lubricants.

Count on the proven performance of Metalstar™ and Wolfrakote® ladle coats, anti-solder compounds, quench compounds and other process lubricants and protectants to meet every need.

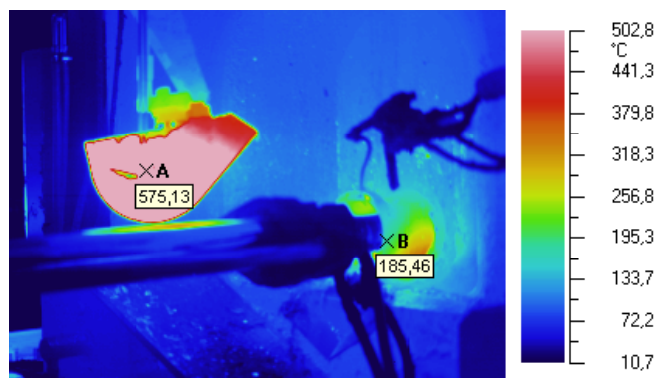
- Assembly Lubricants
- Toggle Lubricants
- Anti-Solder Pastes
- Hydraulic Fluids
- Cleaners
- Corrosion Protectants
- Ladle Coatings
- Start Up Oils
- Quench Compounds
- Trim Press Lubricants
- Heat Transfer Fluids

## CHANGING THE COURSE OF AN UNDESIRABLE HISTORY

### Situation:

A customer was using a competitive ladle coating paste to protect their 2 kg cast iron ladle. Daily application of the ladle coating was required, with the consumption amount of approximately 10 grams. The customer was dissatisfied with the wear and short life of the ladle of less than one week. The customer was also experiencing:

- High ladle replacement costs
- Production stoppages of 30 minutes every week to change the ladle
- Thermal shock creating cracks and holes on the surface
- Daily application to avoid erosion of the surface with applications - sometimes required every 8 hours



Chem-Trend analyzed the customer's ladle with thermal imaging technology to properly assess the situation.

### Solution:

We suggested a test with our product Wolfrakote® Top Paste. The ladle was first cleaned to remove any residue, followed by a sand blasting process to open the pore surface to improve adhesion. Two thin layers of Wolfrakote® Top Paste were applied along with a slow immersion into the bath to set the treatment.

### Benefits:

The customer was able to reduce the application of the coating to only twice per week using a total of 20 grams of ladle coat. Significant ladle life increases were realized from one ladle a week to one ladle every one-to-three months. A 75% cost reduction in annual ladle coat product cost, along with additional cost savings of reducing employee ladle change efforts and production downtime convinced this customer of the Wolfrakote® advantage.



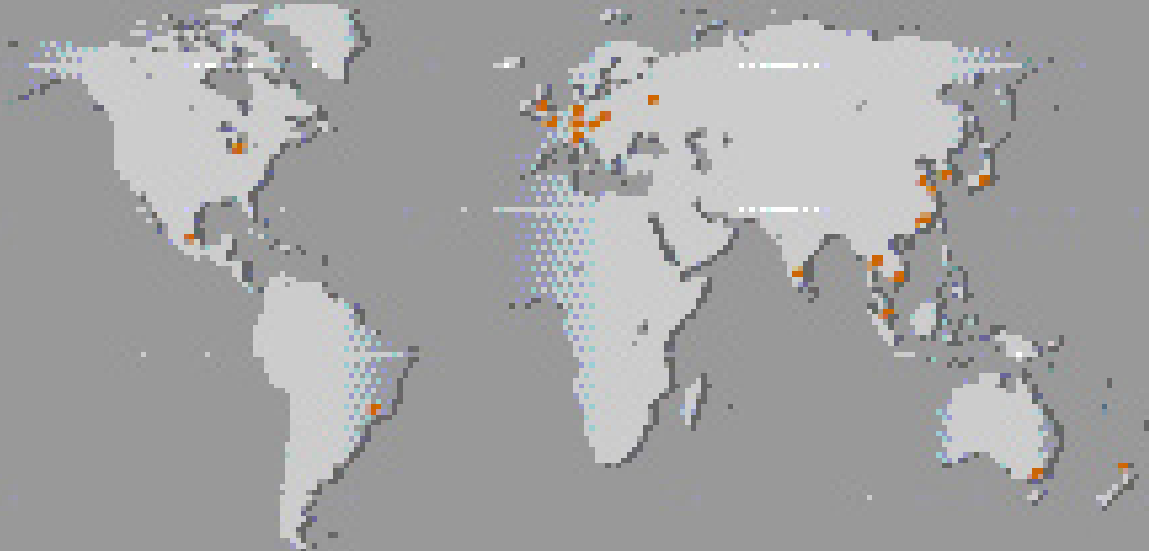
## METALSTAR™ AND WOLFRAKOTE® ANCILLARY PRODUCTS

A comprehensive range of Chem-Trend maintenance and process enhancing products keeps machinery running better and longer.

PRODUCT CATEGORY	FORM	APPLICATION AREA	APPLICATION METHOD	PRODUCT BENEFITS
<b>Anti Solder Pastes</b>	Paste	On the die face	Brush	Localized solder protection, improves release, reduces downtime
<b>Assembly Lubricants</b>	Oil-based paste	Between tool and die	Brush	Good lubrication and water resistance even at high temperatures
<b>Cleaners</b>	Water-based liquids	Die lube spray system	Recirculation	Removal of biological and organic deposits leading to improved spray patterns
<b>Corrosion Protection Lubricants</b>	Aerosol or grease	On die and machine parts	Brush or spray	Prevents corrosion and increases part life
<b>Trim Press Lubricants</b>	Water or oil-based liquid	Trim press	Spray	Improves lubricity, extends blade life, reduces energy consumption
<b>Ejector Pin Lubricants</b>	Oil-based aerosol or paste	Ejector pins	Brush or spray	Improves lubricity, extends pin life, reduces energy consumption
<b>Ladle Coat</b>	Oil-based paste	On ladles and other areas exposed to molten metal	Brush	Increases ladle life and reduces flash
<b>Quench Compounds</b>	Water-based liquids	Quench tank	Periodic addition to tank	Reduces oxidation on casting
<b>Start Up Lubricants</b>	Oil-based liquids or paste	On the die face	Brush or spray	Reduces scrap and shorter time to reach operating temperatures
<b>Toggle Lubricants</b>	Oil-based liquids or paste	On toggles, die rails and other high load areas	Metered drip or brush	Improves equipment life, reduces energy and flash
<b>Hydraulic Fluid</b>	Water-based liquids	Hydraulic systems on machine	Periodic addition to reservoir	Non flammable fluid reduces risk
<b>Heat Transfer Fluids</b>	Oil-based liquid	Die temperature control system	Periodic addition to reservoir	Inert fluid efficiently controls die temperatures

\*These are general application references. Please consult your local Chem-Trend representative for specific application information and process parameters.

## Chem-Trend Global Facilities



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