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DIMACHEM

*Technical Data Sheet*

# PRODUCT NAME: EZ DRAW® SYNFORGE 2000

## DESCRIPTION

**EZ DRAW® SYNFORGE 2000** is a premium, graphite-free, water-based inorganic synthetic forging lubricant engineered specifically for heavy-duty hot forging of high-carbon and alloy steels, such as HF-1. Utilizing a proprietary blend of boron-molybdate glass-formers and inorganic boundary lubricants, it provides a high-tenacity protective film that excels at temperatures up to 2150°F (1177°C).

## KEY PERFORMANCE BENEFITS

- Zero Flash Point: Eliminates instant fire and smoke hazards common with oil-based swabbing compounds.
- Superior Release: High-concentration inorganic oxide complex prevents galling and "stuck" parts on long-stroke ram dies.
- Active Cooling: Optimized water-to-solids ratio utilizes evaporative cooling to manage die dimensional expansion.
- EHS Compliant: Graphite-free formulation ensures a cleaner workspace and eliminates conductive dust issues.
- Protective Barrier: Forms a "glassy slip" melt phase that inhibits scale formation and decarburization on the workpiece.

## TYPICAL PHYSICAL PROPERTIES

| | |
|---|---|
| Appearance | Opaque White / Off-White Liquid |
| Active Lubricants | Molybdate, Borax, Zinc Oxide |
| Binder System | Refractory Silicates |
| Flash Point | None (Non-Flammable) |

## APPLICATION

For optimal film formation, die surfaces should ideally be between 200°F and 800°F. The chemistry is designed to "wet-out" quickly, overcoming the Leidenfrost effect during rapid immersion.

Dilution: While provided as a high-performance concentrate, it can be diluted with water depending on process severity. For 2 Stage long-ram forging, use at 100% or 1:1 dilution.

Maintenance: Agitation is recommended before use to ensure uniform distribution of the solid boundary lubricants. Additives are available to improve ram die coat out or to reduce excess residue buildup. Consult with your Dimachem Technical Sales Representative.

**FAQ**

## Testing & Burn Off

**Q: Has Dimachem completed a burn test on this product?**

- Yes. Laboratory testing on substrates at 500°C confirmed zero ignition and zero smoke generation. The formulation is strictly inorganic and water-based, containing no oils, solvents, or carbonaceous materials. The only byproduct of contact with hot metal is water vapor (steam). We can demonstrate application on ingots from 400°F-2000°F to confirm that the film fuses to the surface without combustion.

**Q: Do we know the approximate viscosity of the liquid?**

- The viscosity is approximately 500-1200cPs (standard Brookfield, Spindle #2), giving it a flow profile similar to a high-quality latex paint. It is a thixotropic suspension, meaning it thins under the shear of a diaphragm pump for easy piping, but thickens slightly when stationary to prevent excessive runoff from the ram dies.

**Q: What are the recommended storage temperatures?**

- Recommended storage is 4°C-38°C. While the inorganic salts are stable, the product should be protected from freezing to maintain the integrity of the rheology modifiers. If frozen, the product should be brought to room temperature and mechanically agitated; it will typically return to a usable state without losing performance.

**Q: What is the expected shelf life?**

- The current formulation has a shelf life of 6 months. Because it is a "clean" synthetic, it does not naturally support heavy bacterial growth, but for extended storage, a biocide can be added. We recommend a "First-In, First-Out" inventory practice.

**Q: Do you know the approximate vapor density?**

- The only volatile component is water vapor. The "vapor density" of the resulting steam is approximately 0.62 (relative to air = 1), meaning it is lighter than air and will rise rather than accumulate in low areas like press pits. There is zero risk of flammable or toxic vapor pooling.

**Q: Can you recommend an appropriate respirator for handling? Is there a concern about the product becoming airborne during die blowout?**

- Since the product is graphite-free and VOC-free , inhalation risk is significantly lower than your current process. For general handling, an N95 particulate mask is sufficient to protect against any dried overspray dust. During die blowout, the solids (Zinc Oxide and Silicates) can become airborne; however, these are non-combustible inorganic minerals. Reducing

inhalation risk is our priority, and this formulation eliminates the soot and polycyclic aromatic hydrocarbons (PAHs) found in graphite-oil smoke.

**Q: How do you expect this product to perform compared to graphite in terms of tool life?**

- We expect neutral to improved tool life. While graphite is a "standard" lubricant, it often fails to stay on the die at extreme temperatures such as 2000°F. Our product uses a "molten glass" phase that provides a more consistent physical barrier against galling, which typically extends the life of the ram dies by reducing metal-to-metal contact.

**Q: Do you recommend a specific cleaner? How does cleanability compare to graphite?**

- Cleanability is superior. Unlike graphite, which stains surfaces and requires aggressive degreasers, our product is water-soluble in its liquid state. Once dried or "fired," it can be removed with warm water and a mild alkaline cleaner (pH 9-10). It does not leave the slippery, black residue that makes the floor a safety hazard.

**Q: How clean does the system need to be prior to introducing EZ DRAW® SYNFORGE 2000?**

- A thorough flush is required. Graphite is chemically incompatible with this synthetic formula and will cause the suspension to "break" (clump). While a two-day cleaning sounds extensive, it is a one-time "investment" to move to a smoke-free environment. Once the system is converted to our product, future maintenance will be much faster.