

HANGSTERFER'S POLICY ON MAGNESIUM MACHINING WITH WATER SOLUBLE COOLANTS

As magnesium gains application popularity due to its high strength and lightweight characteristics, the issue of proper coolant selection for magnesium is becoming more prevalent. Traditionally a low viscosity oil has been the recommended cutting fluid for magnesium machining. The oil functions primarily as a coolant, reducing the risk of fire, which is common to magnesium machining.

Water soluble coolant is not recommended, as magnesium and water are highly reactive. When in contact, magnesium and water generate heat, which, in the presence of highly combustible magnesium fines, creates a serious fire hazard. For the machining of magnesium, Hangsterfer's always recommends our Missile Lube # 1XL, a clear light weight oil, and our Hard Cut NG series, a clear, high flash point, light weight oil, as the first choice.

Water based coolants are by far the most common in the industry today, and in most facilities it is impractical to designate specific coolants for certain jobs. Because of this, it is reasonable to expect that machining magnesium with water based coolants will occur. If a Hangsterfer's water based coolant is used for magnesium machining, certain precautions should be taken:

- The cutting operation should be either submerged or completely flooded.
- Swarf should be removed from the machine sump, collection bin and surrounding floor area daily.
- Appropriate magnesium fire extinguishing media should be on hand at all times (i.e. borax, cast iron fines, sand). *Contact your local fire department for approved magnesium fire extinguishing equipment information.*

The inherent properties of magnesium require caution during machining. Magnesium swarf and chips have the potential to ignite when moisture is present; therefore, using a water reducible coolant can cause a fire. Proper handling of chips and swarf during and after the machining process is important to reduce the risk of fire. In addition, the chips should be stored outside of the machine shop in proper containers that avoid moisture. Please follow any governmental guidelines for storage of magnesium chips.

It is imperative that the cutting operation be kept as cool as possible and that contact of the magnesium swarf with the water be minimized. Taking these precautions and with careful supervision, magnesium can be machined safely and efficiently with Hangsterfer's coolants.

Based on results obtained in the field, as well as tests performed in the laboratory, the formulation of Hangsterfer's coolants has provided excellent results on magnesium machining. The high quality additive package is superior to competitive coolants for corrosion protection and surface finish on magnesium.

Keep in mind that due to the nature of magnesium, Hangsterfer's Laboratories and its distributors can assume no responsibility for any fires and/or fire damage sustained while machining magnesium with a Hangsterfer's metalworking fluid.

The instructions and recommendations as stated on this reference sheet are guidelines. Because the interpretations of the end-user are something over which Hangsterfer's Laboratories, Inc. has no control, Hangsterfer's Laboratories, Inc. assumes no liability for incidental, consequential, or direct damages of any kind, regardless of causes, including negligence. Additionally, this document contains information from the firm of Hangsterfer's Laboratories, Inc., which is confidential and/or legally privileged. Any unauthorized disclosure; reproduction or distribution of this material is strictly prohibited.