

LUBRICATING THE SHOT SLEEVE

Why Lubricate the Shot Sleeve?

Shot sleeve wear and consequent replacement, can be an ongoing and costly problem for die casters. Many mistakenly assume that sleeve wear results primarily from the gap between the plunger and the shot sleeve shrinking as a result of unequal thermal expansion. Actually the opposite is true. If the temperatures of both the shot sleeve and the plunger tip are not constantly and accurately controlled, the clearance may increase sufficiently to allow the aluminum alloy to penetrate the gap. The abrasive silica in the alloy then soon erodes the sleeve. This is in fact the principal cause of shot sleeve wear.

In today's competitive market, effectively managing the clearance between the plunger and the shot sleeve is a prerequisite for any successful light metal die casting system. Clearance problems can only be resolved by good design and thermal management, not by lubrication. The primary purpose of shot sleeve lubricant, therefore, is simply to reduce the friction between the sleeve and the plunger, and to thus ensure the smooth passage of the plunger through the sleeve. This is essential for consistent shot velocities, and to extend the operating life of both the shot sleeve and the plunger tip.

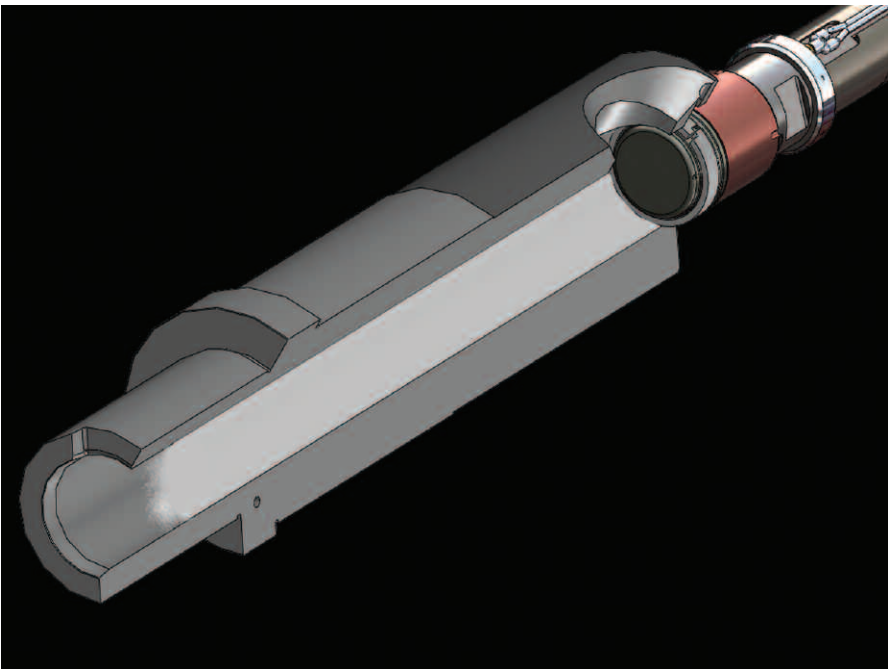
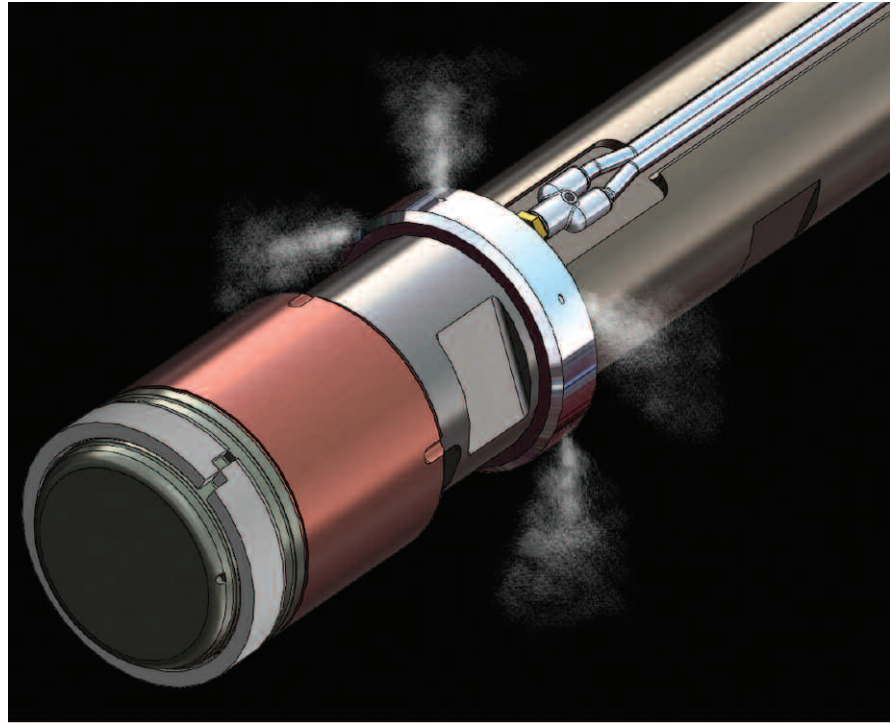
Too Little or Too Much?

The amount of lubricant used must be adequate, but care should be taken to avoid any excess. Lubrication should therefore be kept to an absolute minimum. It should be benign, and produce no toxic fumes.

Every effort must be made to eliminate the possibility of any non-metallic substance getting into the mold. Graphite-based lubricants, for example, can cause porosity in the casting.

Lubricant should be applied where it is needed... and only where it is needed.

Any excess lubricant not actually used, is an unnecessary cost and a workplace pollutant.



A.L.S. 192 – The Ultimate Lubricant

Boron Nitride is just now universally acclaimed as the most effective lubricant yet available for the aluminum die casting industry. Its unmatched lubricity far exceeds that of all other traditionally used lubricants. It is also completely benign, producing no toxic fumes.

Application

For small diameter sleeves of 4in. (10cm.) or less, the Lube-Drop System is usually adequate. This incorporates an internal lubricant groove machined into the sleeve, combined with a metered dropper.

For larger and longer sleeves, it is difficult to adequately lubricate the complete interior. Castool ensures this with the popular Lube-Spray System.

How it Works

A carefully measured amount of liquid Boron Nitride is vaporized to form a fine mist. This is blown throughout the length of the shot sleeve, ensuring that the surface is completely and evenly coated with a thin film of lubricant.

The lubricant spray and air nozzle assembly is securely mounted just behind the plunger assembly. The nozzle technology effectively atomizes the liquid Boron Nitride to reduce overall consumption. Atomization takes place external to the nozzle cap.

This ensures that there is no product buildup within the nozzle tube. Nozzles can be quickly interchanged to provide different spray patterns.

Spray pressure and duration are both adjustable. This ensures complete coverage without costly overspray.

The metered dosage injection pump provides the precise amount of lubricant required for each process cycle, with no danger of excess to contaminate the casting.

The entire application assembly can be easily and quickly moved when required.

The Lubrication Mini-System

Aluminum die casting is a holistic process. No single element in the production system operates in isolation. No constituent part, therefore, should be considered individually.

Synergy is only created when the shot sleeve, the lubricant, and the plunger tip, all work together effectively as a mini-system, and as part of the whole.

How to Rate Your Lubrication

To measure the worth of lubrication, or any other part of the production system, there are two basic yardsticks. First, how does it affect the process? Second, how does it affect the life of the tooling?

The Boron Nitride lubrication system by Castool improves the product by eliminating porosity due to non-metallic inclusions. It improves repeatability by facilitating consistent shot velocity. Also, by reducing wear, the Castool lubrication system considerably extends the life of both the shot sleeve and the plunger tip.

FACTS

- **Boron Nitride lubricant improves quality of casting**
- **Complete coverage is assured**
- **Porosity due to excess lubricant is eliminated**
- **Scrap is reduced**
- **Increases life of both plunger tip and shot sleeve**
- **Lubrication cycle is completely programmable**
- **Less lubricant is required, cost of lubricant is reduced**
- **Boron Nitride lubricant is absolutely benign**
- **No toxic fumes are produced**
- **Workplace environment is improved**

