PLUNGER TIPS - **ARP**

The plunger tip is a critical element of aluminum die casting process. Its' successful operation depends on a number of factors. The most important factor is its' efficient interaction with a round, straight, thermally and therefore dimensionally stable shot sleeve.

Castool's plunger tips were developed a number of years ago by Allper of Switzerland. The plunger materials have been developed jointly between Allper and SCHMELZMETALL over the last 30 years particularly for die-casting. All the copper alloys are refined from virgin materials, heated and casted in high vacuum to avoid oxides, forged and thermally precipitated. The alloy combines high fatigue, high hardness, high resistance to heat and high thermal conductivity.

PURPOSE

- Prevent alloy from penetrating between the shot sleeve and plunger, prolonging tooling life
- Move smoothly and consistently, with a minimum of lubrication, through the shot sleeve bore increasing casting properties
- Maintain a secure seal with the shot sleeve wall necessary for an effective vacuum to be drawn reducing porosity
- Cool the biscuit quickly to reduce cycle times

FUNCTION

The function of the plunger tip is the extension of the plunger rod, which pushes the molten alloy into the mold. There are a number of functions that must be satisfied by an effective plunger tip.

- To repeatedly transmit the force of the plunger rod, at high temperature, to the alloy.
- To maintain a seal with the shot sleeve wall during the shot, eliminating flash or blow-by and preventing air from being drawn into the alloy when using a vacuum.
- To remain thermally and therefore dimensionally stable throughout the shot allowing consistent and repeatable shot velocities.
- Since the tip is dimensionally stable, and the gap controllable, steel wear rings can be attached to the plunger tip body to provide a guarantee that the seal is maintained.

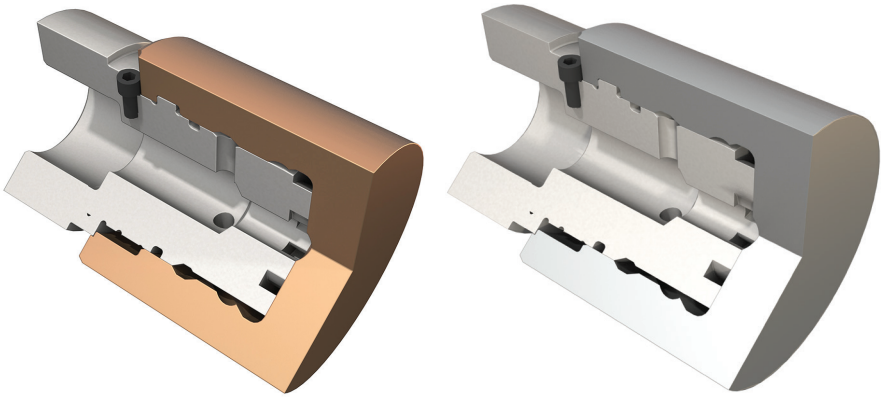
FUNCTION continued on next page

The ARP Plunger

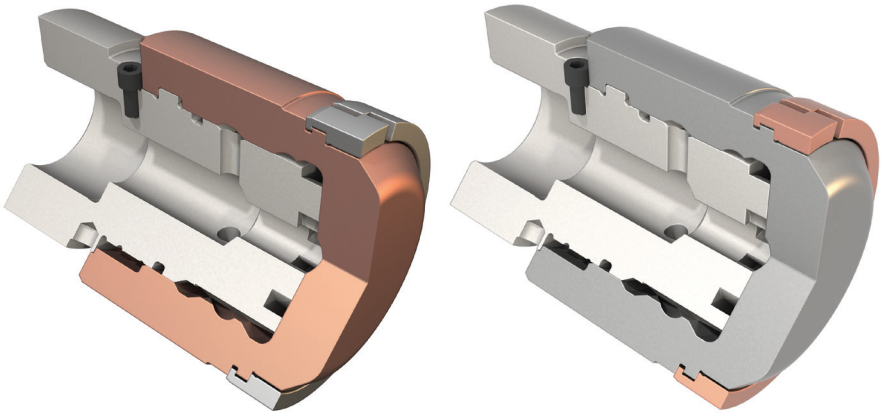
The ARP is recommended for medium machine, from 90 mm up to 120 mm diameter. The plunger body is made of A52 copper alloy. The A52 is forged ultra high strength beryllium copper alloy. The alloy has minimum 680 MPa tensile strength and 230 W/mK thermal conductivity.

Con-Duct is a lower cost alternative with good thermal conductivity 42W/mk and very good toughness. A replaceable steel or copper split wear ring as above provides good wear resistance. A stainless steel holder with a quick release bayonet coupling with water flows directly to the inside face of the plunger tip where a turbulent flow is generated to maximize the heat transfer.

The ARP has excellent thermal stability and high strength.



ARP-A: A solid forged beryllium copper or Con-Duct tip is fastened to a stainless steel holder with a quick release bayonet coupling



ARP-R: An expanding steel (H-13) or copper wear ring (A52 or A25) is attached to the beryllium copper or Con-Duct ARP plunger tip

SHOT SLEEVE

The sleeve should be straight and round under production temperature. If it is not the case, aluminum will penetrate between the clearance of the plunger tip and sleeve. The good news is, that in most cases, shot sleeve expansion on small to medium size shot sleeves is easy to manage.

FUNCTION continued...

- **Because the ring is flexible, it makes continuous contact with the inside of the shot sleeve. Flash, which is a major cause of wear, is essentially eliminated. Shot speeds are consistent.**
- **Since the expanding wear ring ensures a secure seal between the plunger and the shot sleeve, a better vacuum can be drawn.**
- **An additional advantage is that the face of these is considerably cooler than that of other plunger tips. This cools the biscuit much faster, and reduces the cycle time significantly.**

BENEFITS of the Allper Plunger Tip

- **Reduce cost per shot**
- **Increase plunger life**
- **Increase shot sleeve life**
- **Improve vacuum seal**
- **Reduce flash**
- **Reduce scrap rate**
- **Reduce downtime**

With the Allper Plunger Tip, Castool again sets a new standard of excellence in the die cast industry.

Results may vary depending on individual press characteristics and setup.

NADCA CORPORATE MEMBER

ISO 9001:2015 CERTIFICATION TM QUALITY

ISO 45001:2018 CERTIFICATION TM SAFETY

ISO 14001:2015 CERTIFICATION TM ENVIRONMENT

www.castool.com

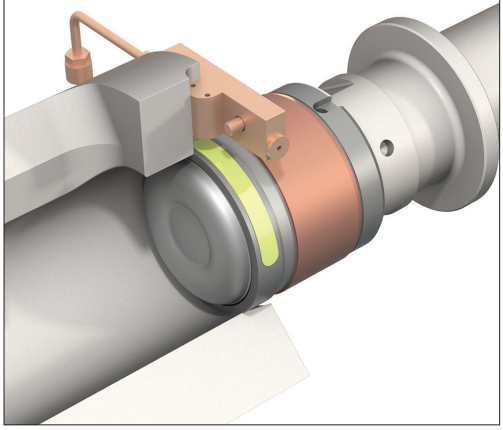
LUBRICATION

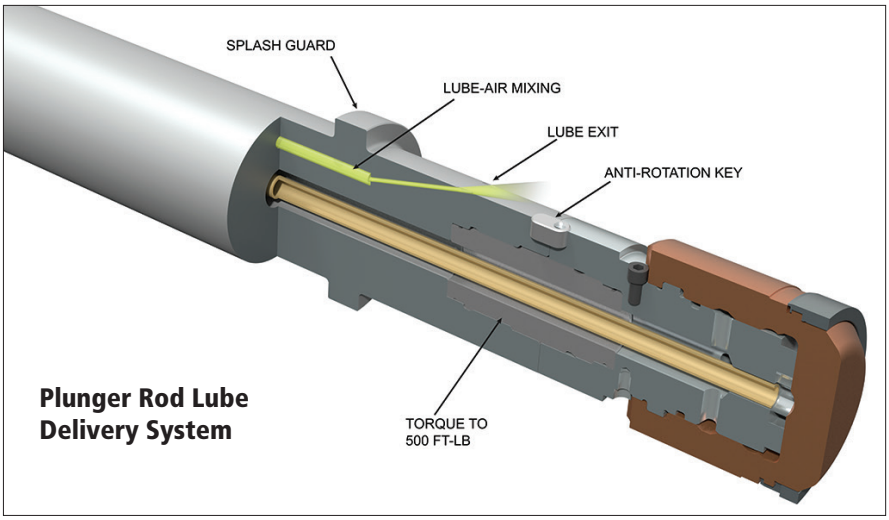
Lubrication should only be applied where it is needed. Every effort should be made to eliminate the possibility of non-metallic substance getting into the casting.

For small shot sleeves, a built-in slot and lubrication channel can be machined into the shot sleeve that delivers lube on top of the plunger ring.

For medium shot sleeves the bolt-on Allper Lube Drop (ALD) system delivers a precisely measured amount of lubricant directly on top of the plunger or plunger ring.

Allper Lube Drop (ALD)



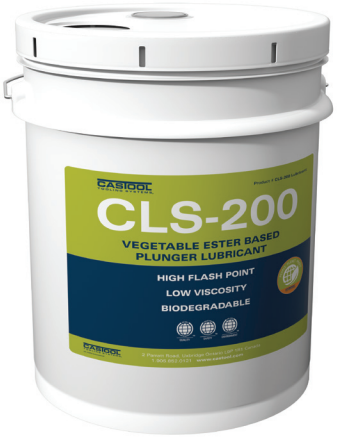


Plunger Rod Lube Delivery System

CLS-200

Vegetable ester based lubricant that is biodegradable. It is blue in colour, remains as a solution and has a high flashpoint. It is also low smoke, and very well priced.

Type:	CLS-200 Vegetable based ester
Part No.:	CLS-200 Lubricant
Packaging:	19 L pail, 208 L drum or 1250 L tote



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