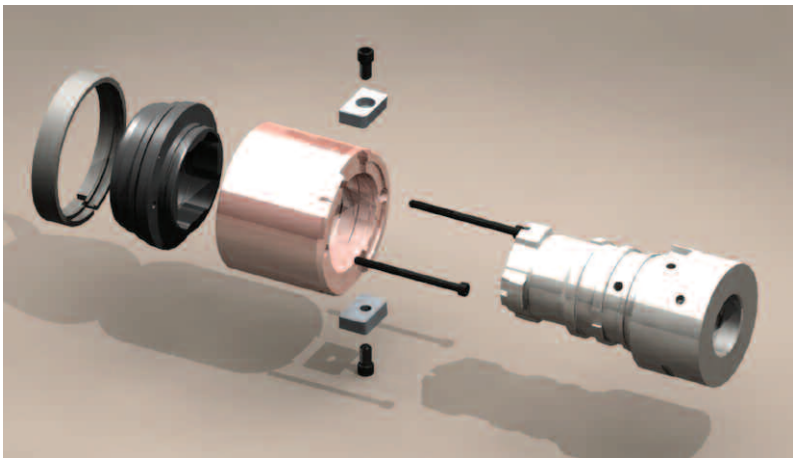
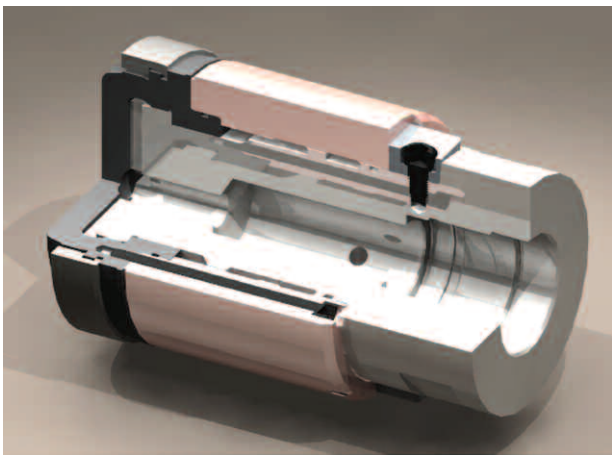
CASTOOL
TOOLING SYSTEMS

PLUNGER TIP





AMP-R plunger tip

Controlling the Gap
During the shot, if the gap between the plunger and the shot sleeve becomes too large, the alloy will penetrate it. This will cause excessive wear of both the plunger tip and the shot sleeve. If the gap becomes too small, there is a danger of interference which will result in inconsistent shot velocities. Controlling this gap is therefore essential to better die casting.

The extended copper body and effective cooling system of the high strength Castool AMP plunger tip, designed by Allper of Switzerland, make it possible to stabilize the temperature and therefore the diameter of the tip throughout the length of the stroke. When used with an efficient temperature controlled shot sleeve, this allows the die caster to control the gap.

The AMP Plunger Tip
This unique tip features a tempered steel head for strength, plus a body of beryllium copper for its excellent thermal conductivity. A conventional plunger tip screws directly onto the rod, which is hollow to allow circulation of cooling water. With the Castool 3 piece AMP tip, a reusable stainless steel tip holder is screwed to the rod.

An existing plunger rod can very often be modified to allow an increased flow of water, and to permit the installation of an AMP plunger tip holder.

The high-strength stainless holder is in direct contact with the inside face of the steel plunger head, and absorbs the full force of the shot.

The steel head of the AMP tip is fastened to the body by two screws. The head is attached easily but securely to the tip holder with a bayonet-type quick release coupling.

In the AMP tip, specially designed coolant channels produce a high velocity turbulent flow of water past the inner face of the holder. This achieves the maximum cooling effect. The water then passes through several channels to the circular external return passage.

The AMP-R Tip
Copper is an ideal medium to dissipate heat from the plunger tip body to the cooling water. It is, of course, not nearly as wear-resistant as the steel of the shot sleeve. Since the tip is now dimensionally stable, and the gap controlled, this problem is resolved by the use of a long lasting steel wear ring.

A flexible split wear ring of tempered steel floats freely in a groove machined near the front of the plunger tip. It can be readily removed and replaced with a special hand tool. The wear ring expands to meet any changing diameter or contour of the shot sleeve.

Because the ring 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 than usual vacuum can be drawn.

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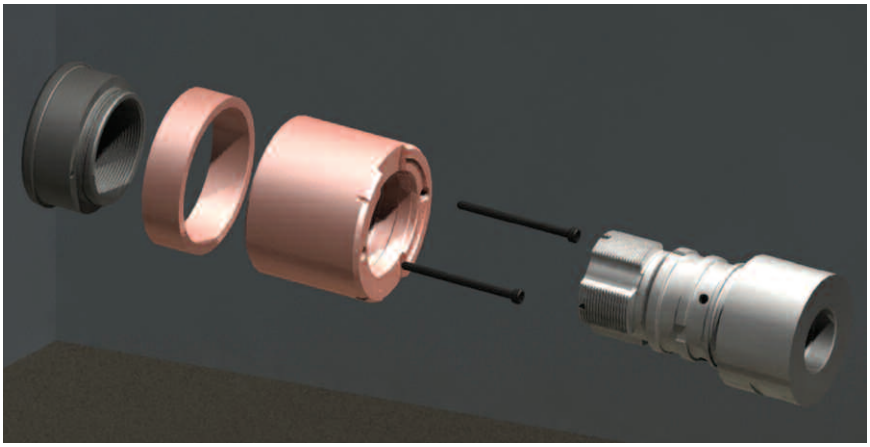

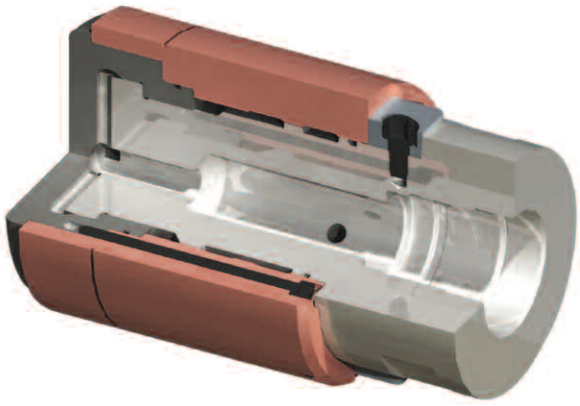

AMP-A plunger tip

The die end of the shot sleeve is chamfered to compress the ring, and guide it back into the sleeve.

The AMP-RR Tip

For large, convoluted close-tolerance castings when an unusually high vacuum must be drawn, the AMP-RR tip is available. It is similar to the AMP-R, but has two expanding wear rings instead of one.

The AMP-A Tip

In an application where the AMP-R tip cannot be used; for example with a 2 piece shot sleeve or a serious alignment problem, it is replaced by the AMP-A plunger tip.

This tip has a tempered steel head for strength, and copper body for conductivity. On the leading edge of the head is a factory replaceable shrink fitted wear ring. This is the only component of the AMP-A plunger tip that actually wears. The durability and economy of this high-strength tip is obvious.

Lubrication

To reduce wear and thus extend the operating life of both the AMP wear rings and the shot sleeve, adequate lubrication is essential. With the AMP plunger tip, however, the amount of lubricant used is considerably reduced, since usually only the wear ring usually needs to be lubricated.

With extra long shot sleeves it is not uncommon for there to be no lubricant at the die end where it is most needed. That is where the pressure is greatest, and the tip diameter largest. For maximum efficiency, it is very important that the complete interior of the sleeve be lubricated in these cases.

Castool offers specially designed lubrication systems and a lubricant designed for these applications.

Care should always be taken, however, to avoid an excess of lubricant. It may enter the die and result in porosity in the casting.

A Critical Interaction

The major technical feature of the Castool AMP plunger tip is its ability to remain stabilized from the start to the end of the injection stroke. No plunger, however, can be more effective than the shot sleeve within which it operates. The successful interaction between these two components is critical to better die casting. The capability of each can therefore never be adequately measured alone.

Benefits of the Castool AMP Plunger Tip

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

Results may vary depending on individual machine characteristics and setup.

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