



DIE CASTING PLUNGER TIPS PATENTED



/Copromec s.r.l.



Copromec was founded in 1999 and started its business as production consultant, planning and building of different kinds of equipment and machining cells for die-casting factories.

Up to now, all **Copromec's** efforts are applied to technical and productive development of the die-casting plunger tip. This product was born after a twenty years experience of technicians who created, planned and tested on a high scale what is today the main product of our company.

Our product has been known and appreciated in a lot of countries thanks to its technological features, quality and innovation. We have patented this system in Italy and abroad.

Besides this leader product, **Copromec** supply also a series of other products planned in order to guarantee high quality performance: rods, sleeves and heat dissipators.

Copromec cooperates with important companies in Italy, Europe and other continents.

The company guarantees the product quality and supplies an excellent technical assistance at the beginning steps and during the usual production cycles, so to meet the customer's requirements of technology growth. This leads to an advantage of both Copromec and its customers. The company is always oriented to new inputs and experiences.

/ Die casting plunger tips patented

The COPROMECC injection plunger tip (Patented) is a powerful innovation built for the cold chamber die casting field (aluminium and magnesium). The innovation consists in using the energy of the liquid aluminium during the injection phase, in order to push the rings on the shot sleeve perimeter.



The system is composed of a steel plunger tip, one or two copper rings and one plunger support pin called support pin. **The plunger tip** is made of a special steel to be efficient with the casting process with a wide temperature range and heavy working conditions. It contains two rings made of a special pressed copper alloy.

The copper rings are always in contact with the shot sleeve and they work as a seal for the liquid aluminium as in a hydraulic system. Between the plunger tip head and the first ring, there are some slots to permit the aluminium to enter under the ring.

The first ring contains the liquid aluminium and uses its power to be in constant contact with the sleeve perimeter. At each injection it enlarges and stops the solidified aluminium below to guarantee the best contact with the shot sleeve.

The support pin is made of a high quality hardened steel and it is assembled behind the plunger tip by a thread. The thread is blocked by the contact with the plunger tip head and the support pin head. The support pin cooling system works utilizing a cooling-hole circuit.

Characteristics and advantages of this system:

- > User friendly system and production efficacy.
- > Acceptance of operator mistakes without expensive damages (ring breaking max).
- > Constant injection cycles as result of compensation created by copper rings.
- > Machine stop reduction.
- > Cycle time reduction.
- > Shot sleeve life improvement.
- > Production efficacy.
- > Shot sleeve ovalization compensation.
- > Shot sleeve taper compensation
- > Compensation of wider tolerances.
- > It supports and balances mistakes due to the poor or absent lubrication

System average life (injections):

- > Support pin: 200.000 to 300.000
- > Steel plunger tip: 50.000 to 100.000
- > Front copper ring: 3.000 to 25.000
(Back copper ring:) first ring x 2 to 3

/Shot sleeves



/shot sleeves

Built on Copromec project and CNC worked.

We have noticed that using our shot sleeves together with Copromec plunger tip, the sleeve life can increase of about 50% in comparison with standard performance.

To build our shot sleeves we use:

Steel 1.2344

Surface hardening treatment:

>gas nitriding

Tempering: 49-50 HRC



/Accessories

/rods

Built according to specific technical features. The rod planning is carefully analyzed in details to balance water input/output, to guarantee a correct cooling system on the plunger tip head.

Other features are:

>easy assembling of water distributor and its pipe

>waterproof system and separation of water input/output of the system.

Material: 39NCD3 R = 100 kg/mm²

Costruction : Copromec project

Working: CNC

/ heat dissipator

To control possible and frequent problems of:

> thermic deformation of the shot sleeve

> erosion of the bottom part of the sleeve due to temperature increase in the area of metal loading

Copromec has planned a special dissipater, whose application is particularly fit in case of:

> important (casting) dimension

> special cycle conditions (particularly fast cycles)

The dissipator assembling is quite easy: it is inserted on the sleeves, introducing it and fixing it with proper supports. Then, the connection of water input and output follows. The dissipator can often been assembled also after the creation of the group rod-plunger tip.

It can be used for several sleeves of the same diameter.

