



 **BrixiaPlast**[®]
PLASTICIZING SCREWS AND BARRELS





We want to approach the plasticizing business as a partner, not only as a supplier.

BRIXIAPLAST designs and produces all components for polymers transformation, like screws, barrels and all mechanical accessories.

Your targets, your applications, your materials are our working parameters for wastes reducing and quality improvement.

BRIXIAPLAST produces high quality products by optimizing the plasticizing process, reducing time, with the lowest percentage of wastes and at the lowest possible cost!

Our long experience in designing and producing all components of plasticizing groups, together with our knowledge of the melting process, allows us to understand your needs and to offer our best solutions at a very reasonable price



PLASTICIZING SCREWS

TURBO PROFILE SCREW (MELT T3)

BARRIER SCREW (MELT SPEED)

The screw basic characteristic is to have high plasticizing and homogeneous melting for the converted polymer. Our experience supplies you plasticizing units suitable to any typology of thermoplastic, crosslinkable and rubber.

SCREW FOR GENERAL USE

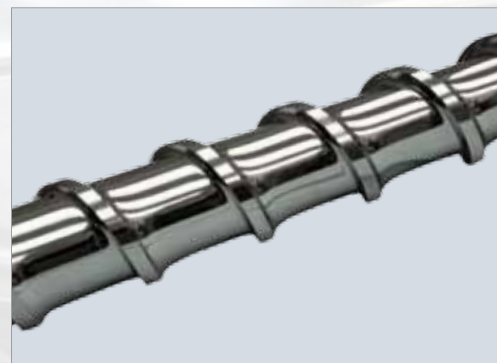
The screw for the generic use has been for years a point of reference especially in the field of the injection moulding. The profile of the universal screw works with almost any existing material though it doesn't reach an elevated level of metering and melting, even if there's an increasing request of these features in order to obtain high quality products. We can underline that this screw is a good compromise for all those applications which do not require a specific demand.

BARRIER SCREW (MELT SPEED) L/D 22-25

Screw with a particular design for the polyolefins process. The concept of pouring consists in a second thread that starts in the compression zone and divides the material from the "solid" duct to the "melted" duct. This allows a better control of the melting product and the mass temperature.

ADVANTAGES

- Increase of output (faster cycles without increasing the screw turns)
- Lower melted mass temperature
- Excellent quality of the melted mass (especially with masterbatch)
- Post-pressure reduction.
- Waste parts reduction.
- Fast return of the investment





TURBO PROFILE SCREW (MELT T3)

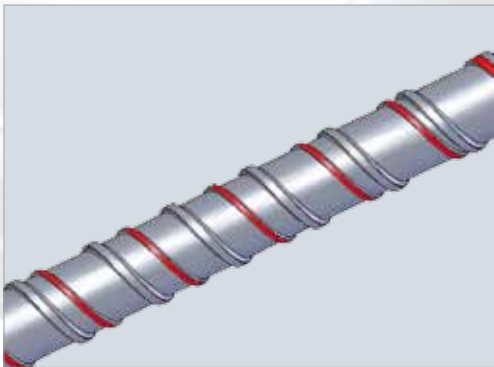
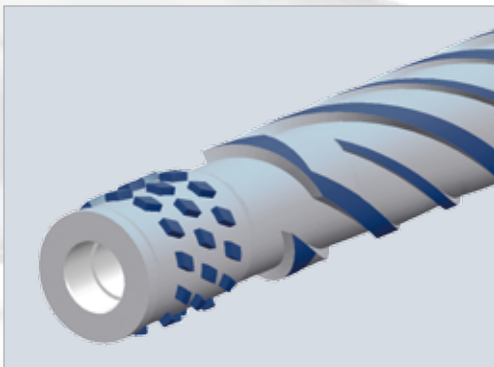
This screw is suitable for poliorefine process with a design that combines a conventional profile with a mixer that has excellent mixing qualities. The mechanical geometry of this screw localizes an area of high compression (metering) forcing the mass to melt in a homogeneous way.

Advantages:

- Lower melted mass temperature
- Elimination grained areas.
- Post pressure reduction.
- Fast color change.
- Mixing properties improved of 4/5 times comparing a standard profile screw.

DEDICATED PLASTICIZING SCREWS:

- | | |
|--------------------|-----------|
| • AMORPHOUS | • PVC |
| • SEMICRYSTALLINE | • LSR |
| • CRYSTALLINE | • PE - PP |
| • BLEND | |
| • THERMO-HARDENING | |
| • ELASTOMERS | |





SCREW COMPOSITION ALLOY

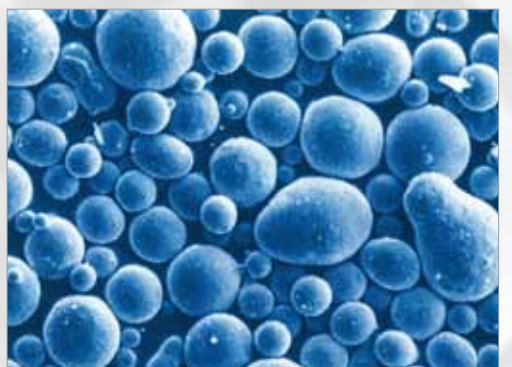
All plasticizing screws during the working process have more or less a different type of wearing due to different factors. Each material (combined with its thermic treatment) has properties and requirements that can resist to abrasive wearing , adhesive wearing and corrosive wearing.

Abrasive wearing: due to fillers type glass fibre/ carbon fibre, mineral fillers.

Adhesive wearing: it is the consequence of friction of metal with metal that because of the high speed together with a high pressure, determines micromelting due to heating

Corrosive wearing: due to acetalic resins, flame retardant, or gas formation during the melting process.

We suggest PVD coating (see PVD section).



MATERIALS

MATERIALS	THERMIC TREATMENT	HARDNESS N/MM2	WEAR RESISTANCE	CORROSION RESISTANCE
1.8509 (41 Cr Al Mo7)	NITRIDING	950÷1100 HV5	•	•
1.8550 (34 Cr Al Ni7)	NITRIDING	900÷1100 HV5	•	•
1.4122 (X35CVM017)	HARDENED THROUGH	50/54HRC	•	• • •
1.2379 (X155 Cr V Mo12.1)	HARDENED THROUGH	59÷62 HRC	• • •	• •
SINTEK 1 KPM 6	HARDENED THROUGH	56÷63 HRC	• • • •	• • •
SINTEK 2 KPM 10	HARDENED THROUGH	56÷63 HRC	• • • • •	• • •

Suitability: (• good) to (••••• excellent)

DIMENSIONS

SCREWS DIMENSION

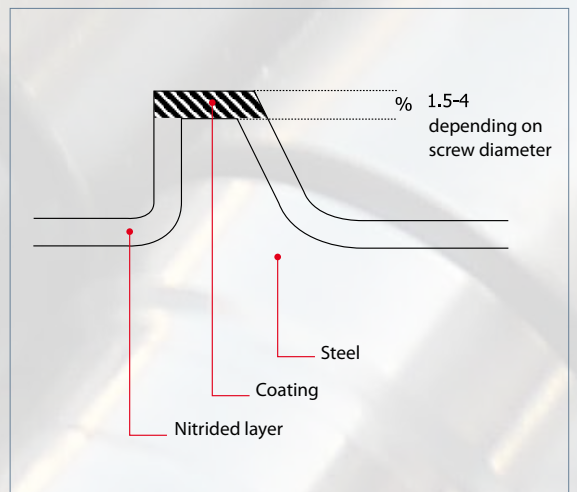
	SINGLE SCREW	DOUBLE SCREW
DIAMETER	14 - 300 mm	35 - 180 mm
LENGTH	8000 mm	6000 mm

Kpm 6 and kpm 10 not included



COATING DEPOSIT

TYPE OF ALLOY	METALS	COATING	HARDNESS	WEAR RESISTANCE	CORROSION RESISTANCE
SPJ1	Co	Plasma - Tig	50-55	• •	• • •
SPJ12	Co	Plasma - Tig	45-48	• • •	• • •
LF56	Ni	Plasma - Tig	50-55	• • •	• • • •
LF5	Fe	Plasma - Tig	58-62	• • • •	• • •
BXC 60	Mo	Plasma	54-58	• • • •	• • • •



Suitability: (• good) to (• • • • • excellent)



BARRELS

BIMETALLIC BARRELS

BRIXIPLAST offers a wide range of bimetallic barrels that covers different types of wearing. Using the latest spin-hardenend system, powders are homogeneously distributed, so, without any type of alteration and porosity. Because of this it is possible to reach parameters of wrinkledness from 0,15 ums, to 0,8 ums. **Our bimetallic barrels lasting life is 5 to 10 times more than standard barrels.**

Metals- Fe

Chemical composition (weight -%)

MATERIAL	HARDNESS HRC - (RT 300°C)	WEAR RESISTANCE (ABRASION)	CORROSION RESISTANCE	THERMAL DILATOMYTRY (25-400°C) - (1/MK)	CR	MO	V	NI	B	C
B12	65-68 (55-57)	• • •	•	12,8	1	-	-	4	2,1	3,6
B21	65-69 (58-62)	• • •	• • •	14,2	10	6	-	4	3,8	2,0

Suitability: (• good) to (• • • • • excellent)

Metals-Ni

Chemical composition (weight -%)

MATERIAL	HARDNESS HRC - (RT 300°C)	WEAR RESISTANCE (ABRASION)	CORROSION RESISTANCE	THERMAL DILATOMYTRY (25-400°C) - (1/MK)	CR	MO	CO	B	W	C
B15	52-56 (49-53)	•	• • • • •	13,1	7	2	35	3,8	-	-
MASTER B25	60-65 (53-57)	• • • • •	• • • • •	11,5	4	1,5	15	2	40	1,9

Suitability: (• good) to (• • • • • excellent)



DIMENSIONS

BARRELS DIMENSION

BIMETALLIC BARRELS	SINGLE SCREW	DOUBLE SCREW
INNER DIAMETER	15 - 400 mm	35 - 180 mm
LENGTH	9000 mm	2500 mm

NITRIDED BARRELS	SINGLE SCREW	DOUBLE SCREW
INNER DIAMETER	14 - 300 mm	35 - 180 mm
LENGTH	9000 mm	2500 mm

B12

Good resistance to abrasion, reasonable resistance to corrosion.

Area of application

Wearing and charged material, high temperature resins and silicones.

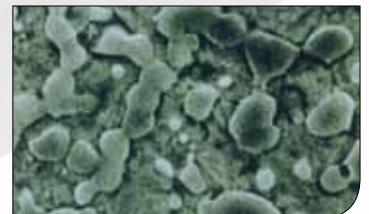


B15

High resistance to corrosion, reasonable resistance to abrasion. Steel made with vanadium, mainly.

Applicazioni

High corrosive materials, acetalic resins, flame retardant.



B21

Good protection and resistance against charged, corrosive and flame retardant materials.

Area of application

Material with generic demand of wearing and corrosion (abs, acrylic, pa, pc, pvc fibred).



MASTER B25

Exceptional durability with abrasive and corrosive materials. Composed steel on boron / vanadium base with high concentration of tungsten carbides.

Area of application

High resistance with reinforced materials.





NITRIDED BARRELS

Standard Barrels: this type of material is used to plasticize polymers that don't produce abrasive and corrosive wearing. Our continuous research in the quality improvement has forced us to choose the best available steels on the market. This material needs to be hardened with nitriding thermic treatment.

GAS NITRIDING

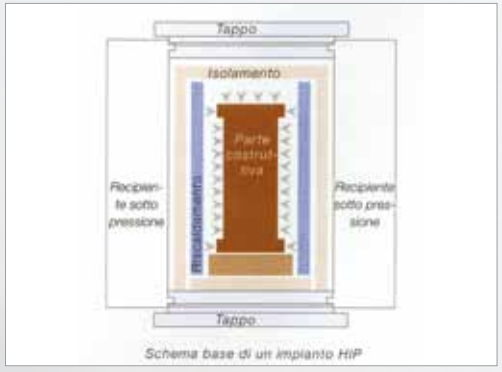
We generally use NT5 72H type in vertical, by which we will have a hardness of 1000-1050 HVs for a depth of 0,4-0,5 mm. It is also possible to reach hardness and depth depending on the length of exposure to the treatment. The vertical position of barrels guarantees uniformity of application with consequent homogeneity of the nitriding area.

IONIC NITRIDING

We apply this treatment to the material where we must have hardened, not fragile homogeneous surfaces. Besides it gives stability to the material eliminating inside tensions (cause of fracture and cracking) The permeability of the treatment reaches 0,8 mm. with hardness 1000-1100 HVs.

SINTERED BARRELS

Superior steels alloy with high performance. With the new technology HIP (Hot Isostatic Pressure), we can obtain alloys that can solve all problems of wear, corrosion or both. This procedure makes the layer homogeneous and extremely unified. The surfaces that we obtain from this procedure are extremely saturated having low coefficients of wrinkledness with very good advantages.



PLASTICIZING GROUPS FOR EXTRUSION

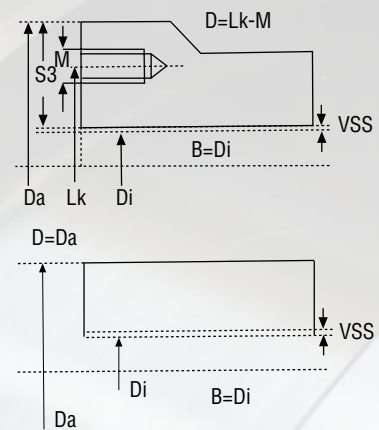
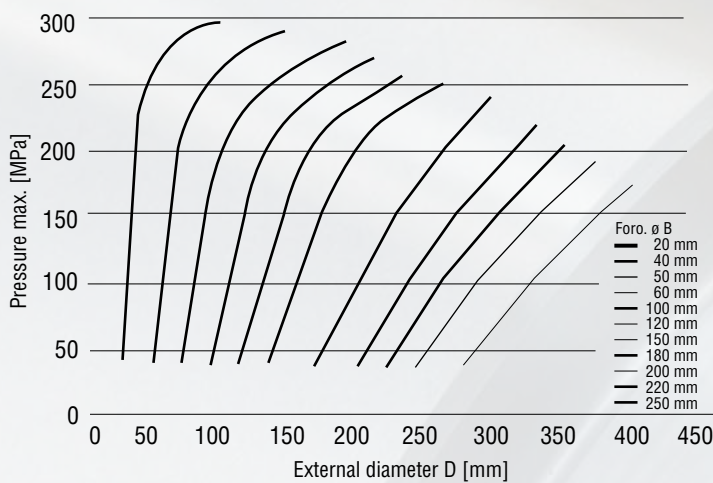
BrixiaPlast supplies screws and barrels for extrusion, based on customers needs. Extruders barrel is normally rifled inside in the feeding area just to help the material feeding itself.

As well as in the injection molding machines, we can supply nitrided and bimetallic barrels with nitrided or coated screws. We also design specific screw profile based on material used and product to produce, just to get the best solution for our customers.

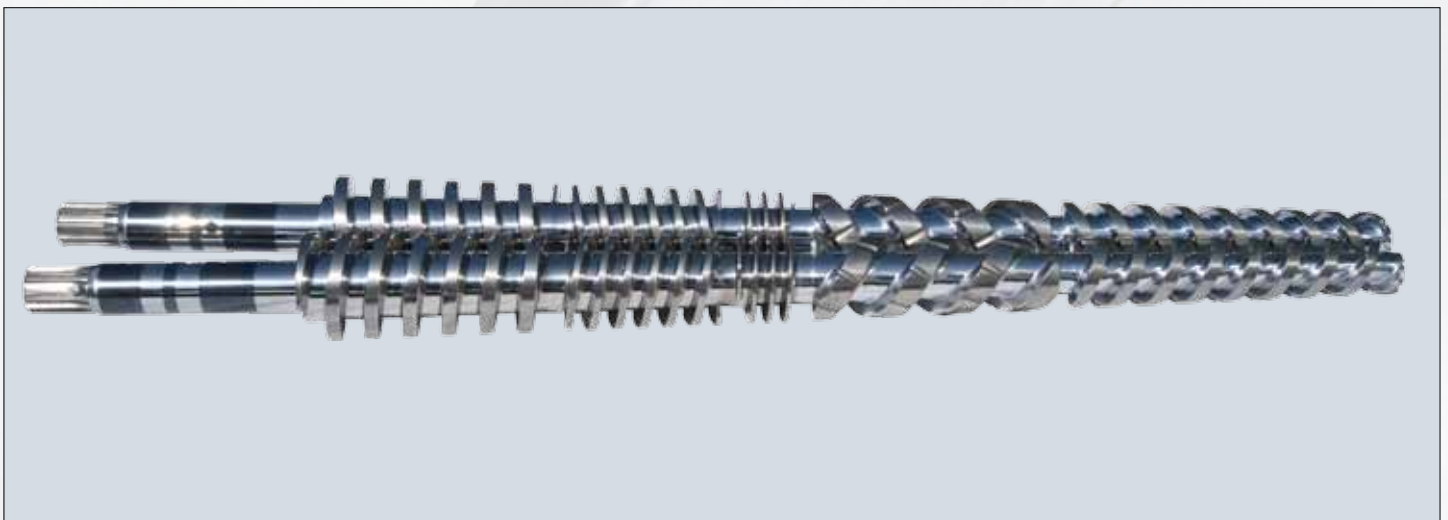
BrixiaPlast best experience is on parallel screws and barrels which are perfectly suitable for pipes, allowing following advantages:

- best plasticizing
- final product best quality
- resins filling reduction cost
- perfect degassing
- perfect melting

For high inner pressure barrels we use a special alloy Cr-V melted.



Maximum pressure inside the barrel, based on external diameter D for different inner diameter B



SCREWS AND BARRELS REGENERATION



BARREL WIDENING

In order to make a barrel to last longer, nitrided or bimetallic, we can widen the inner diameter and re-grind it.

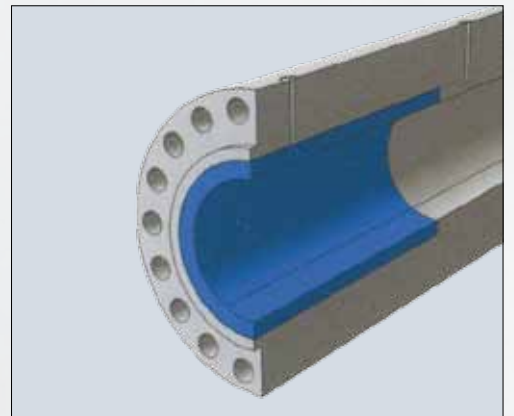
Nitrided barrels have to be thermic treated, after widening, so that we can have a 0,4 – 0,6 mm hardened thickness that allows the barrels to last longer.

After widening the inner barrel diameter, we have to weld the screw crests to the inner barrel diameter measure.



BARREL BUSHING

Sometimes, in the nitrided barrel only, we can fix a bush in the moving ring area. This type of regeneration is only possible when the barrel is worn in a limited area (max. 500 mm). Barrel is then thermic treated by gas nitriding and grinding inside just to grant a perfect shutline.



BUSH TYPES

MATERIAL	MATERIAL SYMBOL	HARDNESS	WEAR RESISTANCE	CORROSION RESISTANCE
STANDARD 1.8509	41 Cr Al Mo 7	950 - 1100 HV	•	•
SPECIAL 1.2379	X 155 Cr V Mo 12.1	59 - 62 HRC	• • •	• •
SLEIPN10	SLEIPN 10	58 - 60 HRC	• • • • •	• •

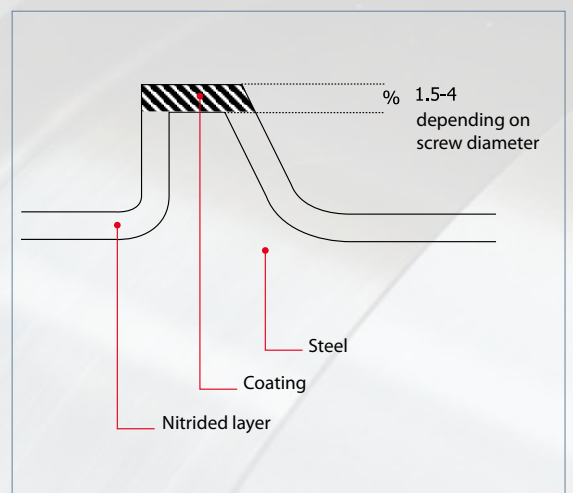


The continuous maintenance costs increasing has forced us to find an alternative solution with the same quality. BRIXIAPLAST invested a lot in the materials research and obtained important results. So, besides normal reparation, we can regenerate screws and barrels completely, thanks to sophisticated welding processes which allow them to last almost like new ones.



Depending on polymers processed, BrixiaPlast suggests different types of welding for nitrided and tempered screws. The regeneration is possible only when the screw core is not worn.

TYPE OF ALLOY	METALS	ALLOY COMPONENTS	HARDNESS	WEAR RESISTANCE	CORROSION RESISTANCE
SPJ1	Co	C Cr W	50-55	• •	• • •
SPJ12	Co	C Cr W	45-48	• • •	• • •
LF56	Ni	C,Si,Cr, B,Fe	50-55	• • •	• • • •
LF5	Fe	C,Cr,Si,Fe,V	58-62	• • • •	• • •
BXC 60	Mo	TUNGSTENUM CARBIDES	54-58	• • • •	• • • •

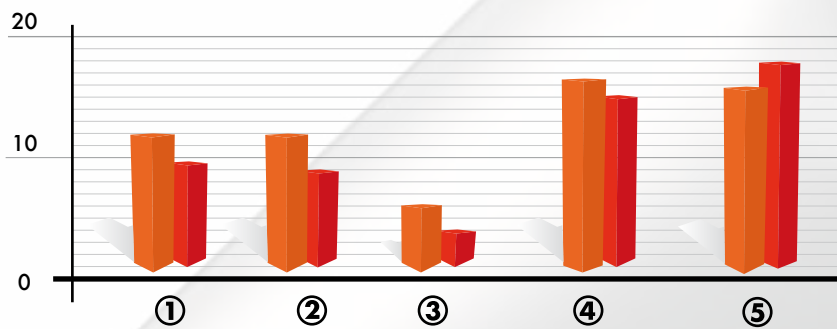


Suitability: (• good) to (• • • • • excellent)

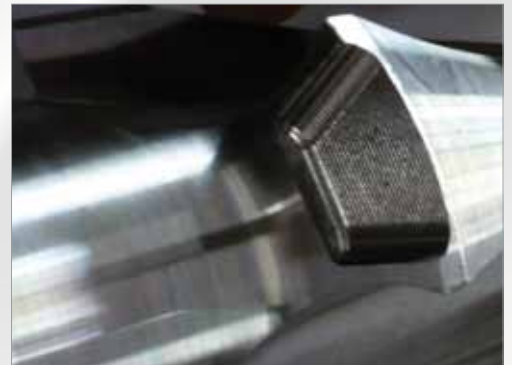


SCREW TIPS

Since many years we realized high resistance to abrasion and corrosion screw tips. To abrasion problems on the screw tip a plasma coating is applied on the surfaces: EUTALLOYD BORO TECH 10009 or VT 100, valves in K55 with special casehardened through. For applications where there is a high level of wear, above all corrosive, special treatment can be applied to the tip: PVD (PHYSICAL VAPOUR DEPOSITION)



- ① VT 100
 - ② E. Boro Tech 10009
 - ③ Nitrided
 - ④ VT 101 Tin
 - ⑤ VT 105 ZRN
- Abrasion resistance
■ Corrosion resistance



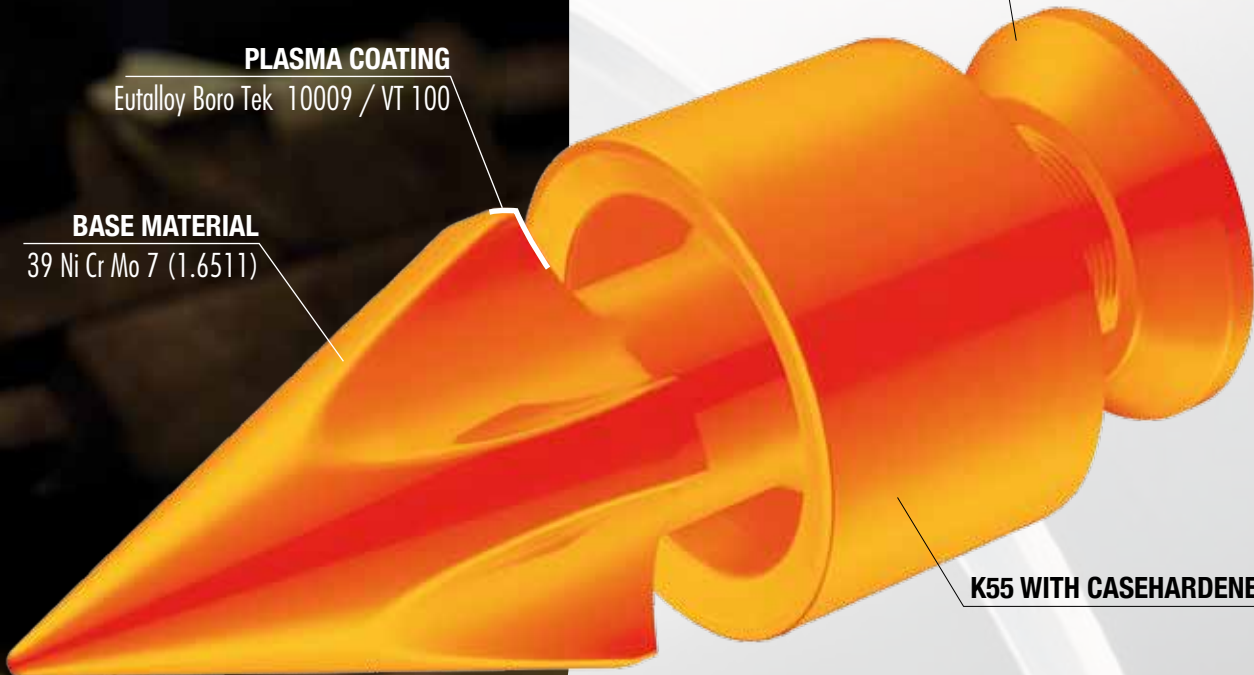
K55 WITH CASEHARDENED THROUGH

PLASMA COATING

Eutalloy Boro Tek 10009 / VT 100

BASE MATERIAL

39 Ni Cr Mo 7 (1.6511)



K55 WITH CASEHARDENED THROUGH

COMPLETE MIXING SCREW TIPS

Applications

- Injection machines with limited pressure.
- Polymers with critical time of continuity
- Streaks and marbled areas problems

Advantages

- Good homogeneity of melted mass
- Best surface quality.
- Best colouring.
- Good quality product even with regenerated polymers
- Suitable on every type



BALL SCREW TIPS

Screw tips with an internal mechanism of flow closing by sphere, and on the external diameter bronze bands to avoid the barrel seizure. Moreover the ball screw tip allows the screw to be centered when the diameter is big.

NOZZLES



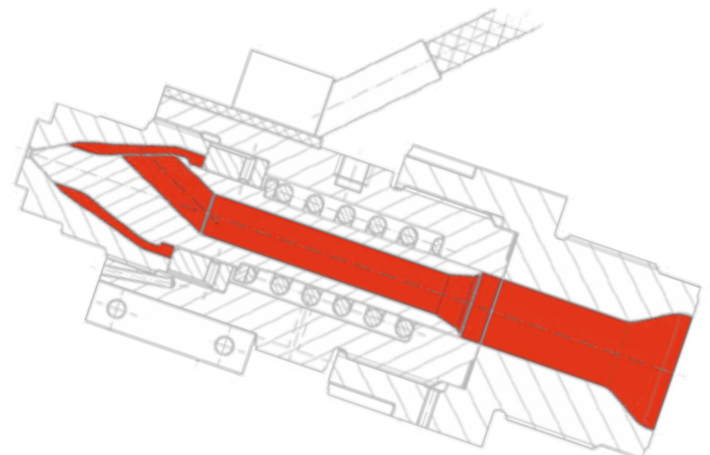
SHUT-OFF NOZZLES

The nozzles with needle are recommended with liquid thermoplastics. The constant cleaning of the closing mechanism (never in contact with the material) and a reliable closing are the most important functions of such a nozzle. Through the ENG system it has been realized a single hole needle nozzle, which satisfies all requests for a more appropriate production for printed items.

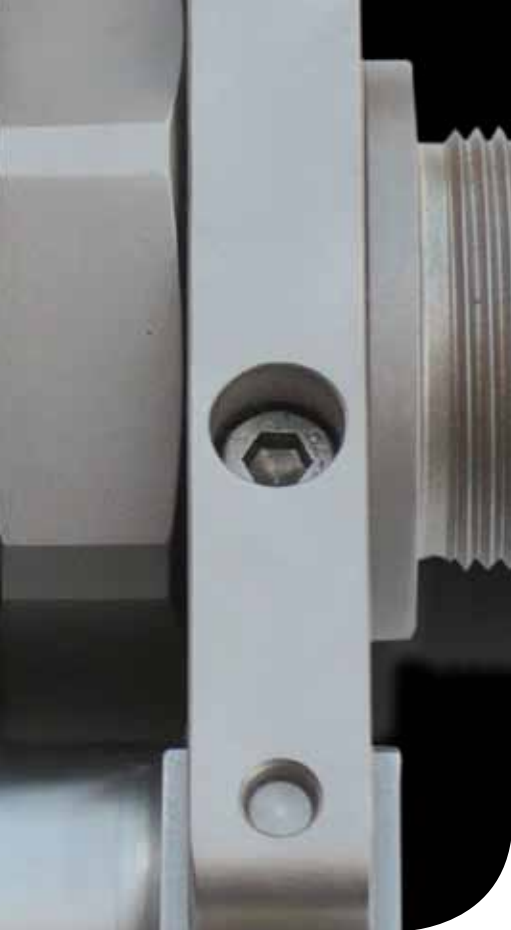
	MEASURE NOZZLE 10		MEASURE NOZZLE 20		MEASURE NOZZLE 30		MEASURE NOZZLE 40
	S10 SPRING	L10 MECHANICAL	S20 SPRING	L20 MECHANICAL	S30 SPRING	L30 MECHANICAL	L40 MECHANICAL
MAX INJECTION FLOW	300 cm ³ /sec		1000 cm ³ /sec		3500 cm ³ /sec		10'000 cm ³ /sec
SCREW APPROX. -Æ	> 30 mm		20 - 70 mm		> 80 mm		> 120 mm
MAX WORKING TEMPERATURE	400 °C						
MAX INJECTION PRESSURE	2500 bar						2000 bar
MAX RETURN PRESSURE	180 bar	600 bar	180 bar	600 bar	180 bar	600 bar	600 bar
OPERATIVE PATTERN	Spring	Pneumatic, hydraulic	Spring	Pneumatic, hydraulic	Spring	Pneumatic, hydraulic	Pneumatic, hydraulic

ADVANTAGES OF SHUT-OFF NOZZLE

- Minimal loss of pressure
- Optimized heat passage
- No solicitation of melted mass
- No filaments loss
- Production without problems
- Controlled and cleaned stopping of material flow
- Reduction cycle time



We have different nozzle head length in our warehouse, always available.



NOZZLE HEAD

- Rotating hydraulic pin available
- De-gassing facilitating modification available



MIXING NOZZLES

- excellent mixing without parts in movement
- melted mass viscosity homogenization
- different polymers mixing and plasticizing process improvement
- easy installation
- streaking elimination, difference of thickness, torsions and tensions



STANDARD NOZZLES

- Personalized according to customers needs: direct or with head, standard length or extended
- Available also in copper berillio for non heating points with external band resistances
- Available with inside band resistances for longer mold access



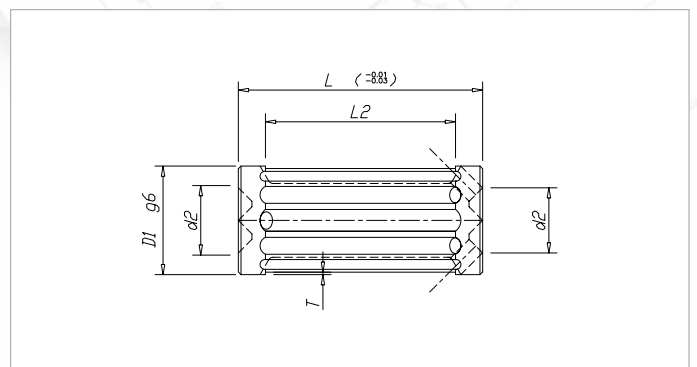
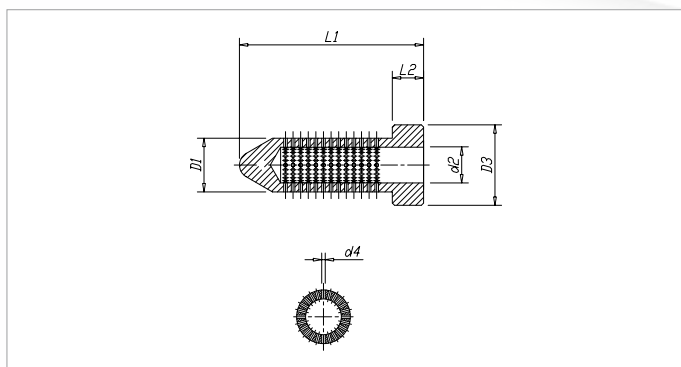
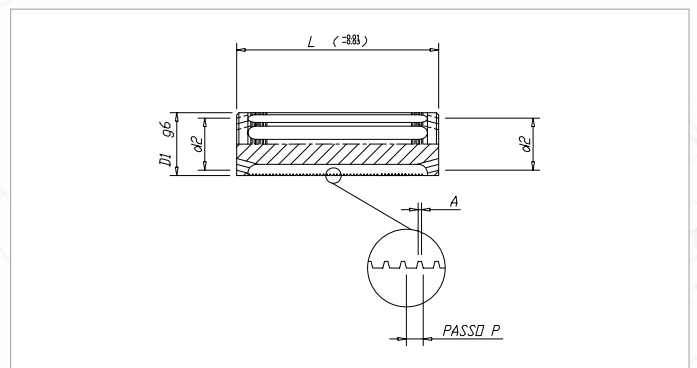
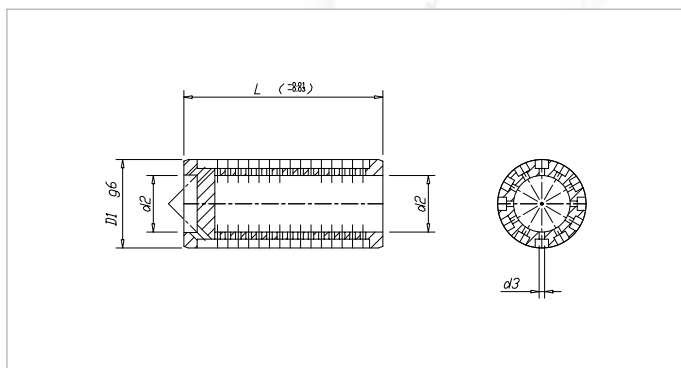
FILTERS AND COATINGS

FILTER NOZZLES

The filter nozzle takes impurities out in the injection process preventing hot canals damages.

CHARACTERISTICS:

- Minimum pressure loss
- Regenerated materials suitable
- Easy installation
- Flexibility





PVD COATING

(PHYSICAL VAPOUR DEPOSITION)

This kind of coating is a deposition treatment by vaporization of one or more metals in a vacuum chamber at a temperature of 400°C – 450°C for pvd and 850°C – 1100°C for cvd. This coating is used against cratering, abrasion and to facilitate the material sliding, which means better equipment maintenance and better surfaces, so, in the end, better production quality.

A very interesting aspect about this kind of coating is that it can be done several times, even if we suggest to take the previous coating out.



SUGGESTED COATINGS

PVD TIN TITANIUM NITRIDE:

The color is golden yellow, the thickness is 2 – 5 micron, the hardness is 2000 – 2500 hv
Resistant to abrasive and adhesive wearing, facilitate material sliding. Perfect against corrosion.

PVD CVN CHROME NITRIDE:

The color is silver grey, the thickness is 3 – 7 micron, the hardness is 1800 – 2000 hv
Resistant to corrosion, very low friction coefficient, resistant to hot oxidation.

PVD ZVN ZIRCONIUM NITRIDE:

The color is yellow, the thickness is 1 – 3 micron, the hardness is 2600 – 3100 hv
High hardness grants an excellent barrier against the wear

COATING	HARDNESS HV (0,05)	THICKNESS (MICRON)	FRICTION COEFFICIENT (100 CV6)	OXIDATION RESISTANCE (°C)	WEARING RESISTANCE	CORROSION RESISTANCE
TIN	2000-2500	2.5	0.67	500	• •	• • •
CVN	1800-2200	3.7	0.57	700	• •	• • • •
ZUN	2600-3100	1.3	0.45	800	• • • •	• • •
WC/C	800-1000	0,5.2	0.1	300	• • • •	•
CHROMIUM PLATING	800-1050	2-4	0.75	600	•	• • • •

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