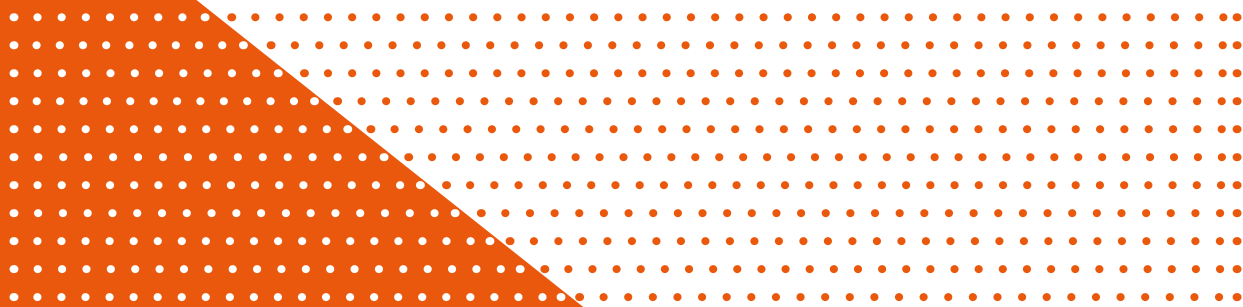




PLASTICIZING SCREWS AND BARRELS



BRIXIAPLAST®

REDEFINING PLASTIC PROCESSING

Manufacturing production capacity up to ø 320 mm and up to 10m's long



Comprehensive spare parts stock for the most common injection moulding machines



20,000 construction drawings for the most common injection machines



Cleaning, inspection and control of the wearing status of plasticizing units



Consulting and technical analysis of plasticizing issues and process optimization: quality of the final product, productivity, cost reduction



Assembly and disassembly service, machine start-up, process parameters supervision



Workshops for customers conducted by our technicians with over 30 years of experience in the plastics processing sector



BRIXIA PLAST

**A leadership that we build every day.
Made in Italy**

Founded in the 90's, **BRIXIA PLAST** has grown to become one of the foremost manufacturers of plasticizing units, with a reputation for supplying products of the highest quality, supported by a global distribution network.

Offering an extensive range of industry standard plasticizing parts, years of **accrued knowledge and experience** also allows **BRIXIA PLAST** to develop and manufacture highly customized solutions, ensuring that the challenges of an evolving marketplace are always met.

Quality, innovation, competence and service form the core principles of **BRIXIA PLAST** and ensure that our team is constantly striving to offer the highest level of support for our customers.

CERTIFICATIONS



Plasticizing Screws

One of the fundamental characteristics that plasticizing screws must have is a high melting capacity. Finding a suitable screw geometry is one of the necessary steps to improving homogenization and achieving a higher **quality product**. There are also several **economic advantages** such as reducing production waste, reduction in cycle times and increased energy savings. Utilising the experience of our extensive customer base combined with continuous **research and development** and a deep knowledge of the plastic melting process, we have developed a range of screw profiles suitable for every application.



General Purpose Screw

Three-zone **universal profile** screw works effectively with most existing polymers, suitable for almost every application.



Technical Screws

BRIXIA PLAST is able to produce screws for technical applications including degassing screws, PVC screws, mixing screws, screws for extrusion, rubber and thermosetting, as well as for the latest generation of biodegradable polymers.



Dedicated Screws

With the wide range of polymers and applications in the plastics processing industry, **BRIXIA PLAST** have developed a range of screws which are dedicated to **specific applications**, such as mixing screws, double pitch screws and screws with specific compression ratios and by utilising our technical and manufacturing capabilities, we can also develop custom screws, tailor-made to the requirements of each customer.



Multicompound Screw

These screws are manufactured with an innovative geometry which creates a very **high plasticizing capacity**. The result of years of experience, the Multicompound screw can be used with multiple polymers such as classic polyolefins (PP, PE) technical polymers (including nylon) and transparent materials.



Multicompound Screw

The culmination of years of research and development, the Multicompound screw represents a highly efficient and adaptable solution. Suitable for use with different types of polymers, the Multicompound screw is quickly becoming one of the most popular screw profiles on the market.

The Multicompound screw has numerous positive properties, including:

- Higher plasticising capacity
- Better homogenization of the melt
- Better dispersion of masterbatch and other additives
- Reduction of the back pressure
- Reduction of the engine torque required for the rotation of the screw
- Reduction of plasticization temperature
- Reduction of plasticization time

These features combine to create a screw which offers a high melting quality and also generates significant energy savings when compared to a standard screw.

Steel of the screw

MATERIALS	CLASS	DIN	TREATMENT	HARDNESS	ABRASION RESISTANCE	CORROSION RESISTANCE
LK3	Conventional		Gas nitriding	950 - 1100 HV	•	•
K55	Conventional		Through hardened	58 - 62 HRC	••	••
SLP	Conventional		Through hardened	58 - 60 HRC	•••	••
VDX	Powder Metallurgy		Through hardened	62 HRC	••••	•
STX	Stainless		Through hardened	50 - 52 HRC	•	••••
M390	Powder Metallurgy		Through hardened	58 HRC	••••	••••

Coating deposit

MATERIAL	BASE	HARDNESS	ABRASION RESISTANCE	CORROSION RESISTANCE
SPJ12	Co	42 - 46 HRC	•••	•••
LF5	Fe	58 - 62 HRC	••••	••
LF56	Ni	59 - 54 HRC	•••	••••
LF83	Ni - Wc	67 - 68 HRC	••••	••••

Coatings and treatment

PVD

PVD (Physical Vapor Deposition) is a coating process that utilises vacuum technology to vaporize a solid metal into a plasma of atoms or molecules. These molecules are deposited as a protective coating onto the surface of another metal. This method allows to obtain a high-performance casing, which is only microns thick, therefore not affecting the product dimensions.

This thick chrome coating is created by utilising galvanic processes. Generally required in instances where the **friction coefficient needs reducing**. This coating is also effective **against corrosion and oxidation**.

CrM

NpR

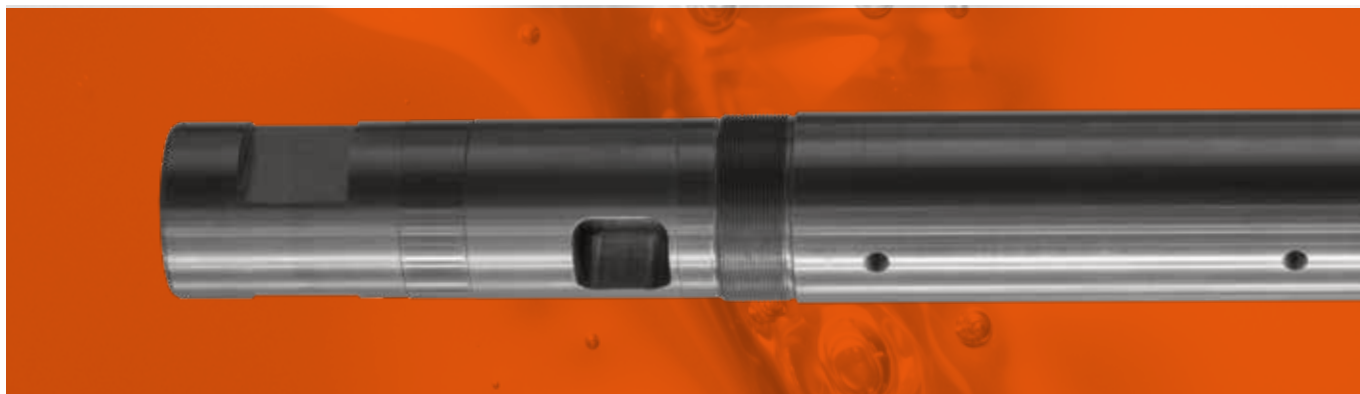
NpR treatment is a **thermochemical treatment (Fe O base)** designed to counteract wear, **increasing surface hardness and decreasing the friction coefficient** of the surface of the screw. This coating can reach a hardness of between 850 and 900 HV and has a thickness of 4-5 µm. This treatment is mainly used on screws where dimensional integrity is key and a PVD coating is unviable.

Comparison table

MATERIAL	TECHNOLOGY	FRICTION COEFFICIENT	THICKNESS	HARDNESS	COLOUR
CroX	PVD	0,3	2 - 5 µm	2000 - 2500 HV	Rainbow
TiN	PVD	0,45	2 - 5 µm	2000 - 2500 HV	Gold
Apro	PVD	0,35	2 - 5 µm	2800 - 3000 HV	Gray
CrM	Galvic treatment	0,17	0,2 - 0,3 mm	900 - 1000 HV	Silver
NpR	Thermochemical treatment	0,45	4 - 5 µm	1200 HV	Black

Barrels

The plasticizing barrel is an extremely important component, it gives **strength** to all the other components within the plasticizing unit and ensures **resistance** to high pressures and wear. Our constant strive to drive innovation and improve productivity has lead us to research and invest in the best range of steels available.



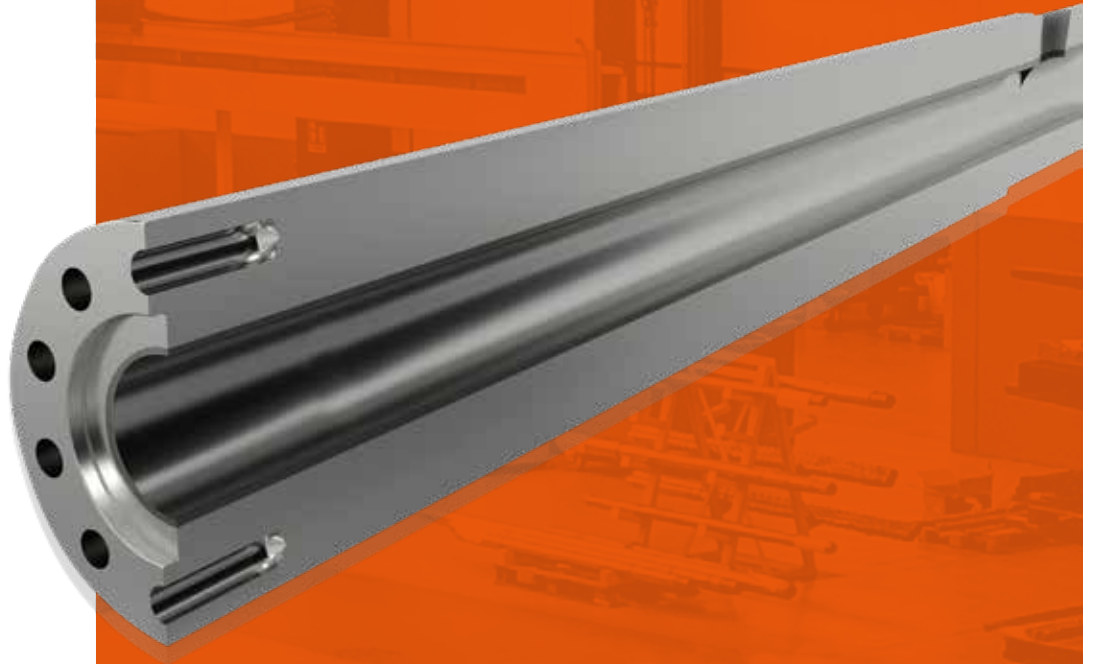
Bimetallic Barrel

BRIXIA PLAST offers a range of bimetallic cylinders that cover various classes of use. Using only **certified materials**, obtained from latest-generation centrifuge equipment, our barrels guarantee **high quality standards**, surfaces free from distortions and porosity and high durability even in extreme working conditions.

Nitrided barrel

Nitrided barrels are primarily used with **non abrasive** and **non-corrosive polymers**. Following heat treatment, the barrel surface can reach a hardness of between 950 and 1100HV.

TYPE	NAME	BASE/DIN	COMPOSITION	HARDNESS	ABRASION RESISTANCE	CORROSION RESISTANCE
Bimetallic	B12	Fe	Ni B C	65 - 68 HRC	..	..
Bimetallic	B21	Fe	Cr Mo Ni B C	65 - 68 HRC	...	..
Bimetallic	B25	Ni	Cr Mo Co B W c C	60 - 65 HRC	....	....
Nitrided	NTR	1,8509		950 - 1100 HV	.	.



The best materials, for the best performance: certified bimetallic cylinders, of European origin, to guarantee **quality, reliability and durability** under every condition.

Screw Tips

The screw tip is a **fundamental part** of the plasticizing unit, and it is the component which is subjected to the most wear. A good seal between the valve, the seat ring and the barrel ensures the proper flow of material and repeatability of the process itself.

An effective screw tip assembly have the **following characteristics**:

- **Avoids stagnation points**
- **Avoids flow restrictions**
- **Seals perfectly within the barrel**
- **Offers a high-level durability**

Another element not to be overlooked in the melting phase is the geometry of the tip itself, which is closely related to the type of polymer being processed.



Standard Screw Tip

The most **traditional and versatile** solution, composed by 3 elements; it is suitable for any type of moulding.

Mixing Screw Tip

Economical solution to **improve the dispersion of color additives**, without any pressure loss.

Sphere (or Ball) Screw Tip

The best solution for larger diameter screw tip assemblies, usually d. 80mm and above. Offers greater precision and repeatability than a standard screw tip assembly whilst also offering a great alignment between the screw and the screw tip assembly.

Locking Ring Screw Tip

Solution in which the valve rotates with the screw tip body during the plastication

Fast Locking Screw Tip

Offers the user a higher level of control over the closing of the valve, that is faster and more precise. Mainly used in applications where a fast cycle time is required, or where liquid polymers are in use.

Coatings

MATERIAL	TECHNOLOGY	FRICTION COEFFICIENT	THICKNESS	HARDNESS	COLOUR
CroX	PVD	0,3	2 - 5 µm	2000 - 2500 HV	Rainbow
TiN	PVD	0,45	2 - 5 µm	2000 - 2500 HV	Gold
Apro	PVD	0,35	2 - 5 µm	2800 - 3000 HV	Gray

Materials

VT100 SCREW TIP

Screw tip body in steel 1,6510 with **BoroTec 10009** welding armor on wings. Valve and seat ring in hardened tempered steel. A classic solution which is **versatile and suitable for a large range of polymers**.

Tip, valve and seat ring in sintered steel produced with powder metallurgy steel. Offering a **high level of durability** against corrosion and abrasion, this material performs extremely well in high wear environments.

M390 SCREW TIP

HA8 SCREW TIP

Tip body manufactured from 1.6510 Molybdenum Steel with **tungsten carbide welding**, valve and seat ring in hardened steel, combined with a PVD coating, making them especially suited for **high wear applications**, traditionally used on screws with larger diameters.

Nozzles

Nozzles are an **indispensable and extremely customisable** product. They can have different designs and come in different steels and coatings.



Standard Nozzle

Customizable according to needs of the customer, can be supplied as a solid nozzle or as a two-part nozzle body and nozzle tip.

Mixing Nozzle

A **mixing element**, available in various sizes, is inserted into the nozzle body (complete with nozzle tip). It is recommended to improve the mixing and homogenization of the material and eliminate streaks of color.

Filter Nozzle

A filter is inserted inside the nozzle body (available in various sizes). It is recommended to **safeguard hot runners and moulds**, especially when using recycled polymers, which often contain impurities.

Shut off Nozzle

The shut off nozzles can be operated by **mechanical, hydraulic or pneumatic locking** mechanisms. They are recommended to ensure a reliable and repetitive process, especially when using low viscosity polymers.

End Caps

BRIXIA PLAST can provide **standard end caps, hydraulic or pneumatic locking end caps**. Coatings may be added to avoid wear and tear, as well as problems due to material stagnation or gas presence.





Shut off nozzles

Shut off nozzles have different applications and they are particularly suitable for liquid polymers.

Each of the components within the shut-off nozzle is easily replaced when worn

- Controlled and cleaned stopping of material flow
 - Reduction in cycle times
 - Minimal loss of pressure
 - Optimized heat passage
- No solicitation of the melted mass

Each of the components within the shut-off nozzle is easily replaced when worn. It is also possible to supply **PVD-coated** components for greater wear resistance.

The locking mechanisms can be mechanical (spring), hydraulic or pneumatic.

Choosing the right model of shut off nozzle is dependent on the maximum injection capacity of the plasticizing unit on the moulding machine.

	S10 - L10	S20 - L20	S30 - L30
Max injection flow	500 cm ³ /s	1500 cm ³ /s	3500 cm ³ /s
Screw diameter	< 30 mm	20 - 60 mm	> 50 mm
Max temperature	400 C°		
Max pressure	2500 bar		

Service

BRIXIA PLAST offers its customers a complete service, from cleaning, to disassembly of plasticizing units, to dimensional checks to ensure parts remain within their manufactured tolerances.

DISASSEMBLING

Our service department is able to disassemble plasticising units and swiftly find and repair any faults that may have arisen.

Utilising the latest generation of pyrolysis furnace, we can **clean** even the most stubborn residues from the plasticising unit whilst complying with the most stringent of environment regulations.

CLEANING

DIMENTIONAL CHECKING

Complete checks are carried out on the customer's components, to verify the state of wear and to detect any problems. Such checks may also be carried out at the costumer's premises by **qualified personnel**.

The refurbishment and regeneration of plasticizing units has multiple upsides. Refurbishments generally take less time and cost much less than the manufacture and purchase of a new unit. So, if you need a cost effective and timely solution, a regeneration carried out by one of our skilled engineers could be the service for you.

REGENERATION

Screw regeneration

A screw can be reconditioned by **welding its helical portion**, but the core of the screw must be in good condition, since the core cannot be repaired. Depending on the type of polymer being processed, **weldings with different levels of abrasion and corrosion resistance are recommended**, both on screws with nitrided and hardened surfaces.

Material	Base	Hardness	Abrasive Resistance	Corrosion Resistance
SPJ12	Co	42 - 46 HRC	...	...
LF5	Fe	58 - 62 HRC	....	..
LF56	Ni	59 - 54 HRC	...	....
LF83	Ni - Wc	67 - 68 HRC	....	....



Barrel regeneration

Barrels can be reconditioned through two methods: bushing or boring of the internal diameter.

Regeneration through bushing method

If the wear is present only in the terminal part (in the screw tip stroke area), it's possible to **regenerate it by bushing**. This **quick and cheap** solution allows to maintain the nominal diameter of the barrel.

When the entire barrel is badly worn it is possible to refurbish the barrel **by reboring, which involves increasing the overall bore size** of the barrel by removing the layer of worn material on the I/D of the barrel. If you do choose to have a barrel refurbished, you will also need to have the screw welded to the new nominal diameter and a new screw tip so that the valve fits the new orifice size.

Regeneration through boring method

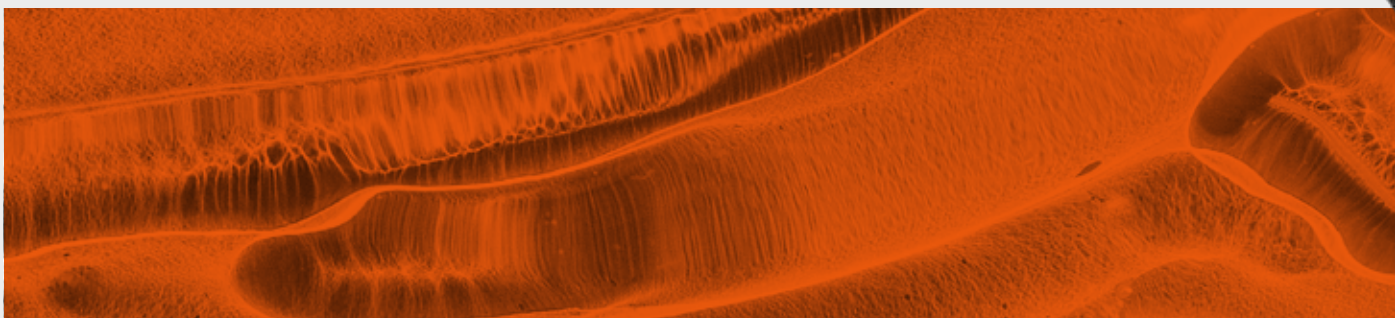


Green Module

Sustainability, efficiency, and energy saving are fundamental issues that guide new business strategies towards new horizons and new perspectives. "How can the components of the plasticizing unit contribute to energy saving and to the optimization of the production processes?"

This is the question we have asked ourselves, and which has led to what is today the Green Module.

The Green Module is our flagship product, an entire plasticising unit where each component has been individually designed to maximise productivity whilst saving energy. Utilising a Multicompound screw, high quality steels and innovative product designs, the Green Module is at the cutting edge of manufacturing technology.



PLUG AND PLAY

Each Green Module is supplied ready to go, pre-wired and with a manual, turning a new install from an inconvenience into a straightforward process.

BRIXIA PLAST's global network of technicians are on hand to help customers all around the world assemble, **install and start-up** their new plasticising parts. We endeavour to ensure that our customers are using the products at their optimum capability from day one!

START UP

DESIGN

Thanks to the **experience and knowledge of our technical team**, Brixia Plast can develop and construct fully customised solutions. Whether you have a specific requirement like **increasing or reducing the injection volume**, or you simply want to **optimise your machine**. We have the capability to design and manufacture the parts that will improve your process.

BRIXIA PLAST can also supply fully insulated plasticising units, which are proven to lower the energy requirements of the plasticising unit, reducing costs, whilst maintaining a high level of performance.

INSULATION



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Notes



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