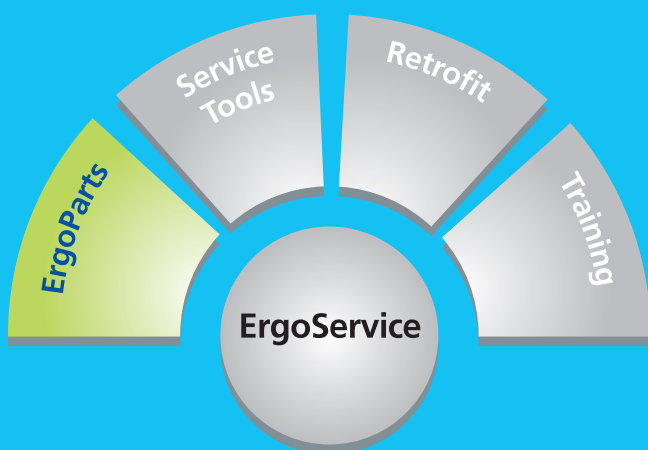




 **Sumitomo**
SHI **DEMAG**



ErgoParts
Plasticising for all requirements

HIGH PLASTICISING PERFORMANCE

Long residence times and premium part quality

Plastics with new properties and increasingly complex performance profiles make ever more exacting demands on the plasticising systems of injection moulding machines. In order to keep abreast, manufacturers of plasticising systems and their components are compelled to provide state-of-the-art screw geometries, screw materials, screw and cylinder coating as well as screw tips and non-return valves.

New challenge from additives and fillers

The development of completely new polymer materials is no longer part of contemporary raw material production, since the chemical modification and the introduction of new or improved additives is sufficient to yield parts with new property profiles. The introduction of flame retardants and stabilisers demands a particularly high chemical resistance of all plasticising components.

Mineral fillers with an abrasive effect on the equipment, oxidic pigments and reinforcing agents such as glass fibres are introduced to polymer materials in ever increasing concentration. This highly-filled plasticised material is as demanding on the plasticising system's wear resistance as rising temperatures or process pressure profiles.

More speciality chemicals – More screw variations

In addition to the classic three-section screw, the market demands a rising number of special screw geometries such as 25 D barrier screws with shear and mixing sections, special screws for PVC, LSR or thermoset processing. Maximum quality requirements for products such as crystal clear components, which are often produced with particularly shear-sensitive polymers, leave no tolerance for streaks, inhomogeneity or excessive heat. These applications demand an extraordinarily high melt quality which is often only achieved by special screws. A high-throughput rate is the first and foremost requirement of high-speed applications. This demands both a special screw geometry and high screw torques. Hence, today's packaging

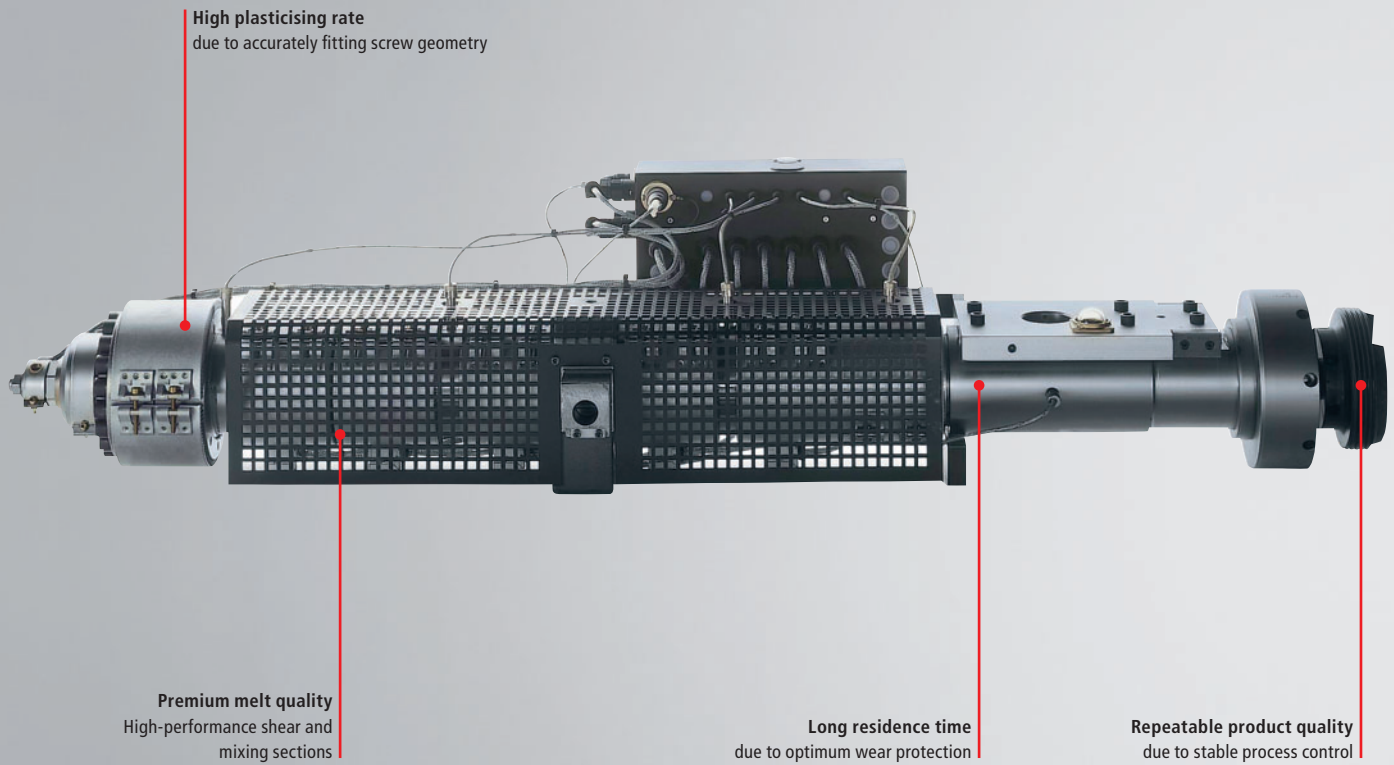
production relies almost exclusively on high-performance screws and electric metering motors. Moreover, colouring concepts such as direct colouring demand an effective homogenisation performance.

Wear protection for more efficient production processes

Wear on the screw in general and on the screw flights in particular has a significant affect on the efficiency of the production process. Wear increases the metering time, causes an uncontrollable rise in temperature, makes process control more difficult and above all, has a detrimental effect on the product quality. In spite of a variety of precautions, wear on the plasticising system cannot always be avoided. In many cases, damage caused by wear is

not only down to the screw, the cylinder, the non-return valve or the nozzle alone. Many wear mechanisms affecting other components have been identified and are the subject of extensive research. Nonetheless, it is important to consider the entire plasticising unit in terms of wear and to find the causes for a limited process stability or an insufficient quality of the moulded components.





Polymer materials		Area of application	Screw geometry	Screw material	Non-return valves	Cylinder
Standard and engineering plastics	Unfilled	Standard	Standard	Fully hardened, high-alloy steel or nitrided steel with hardened flights, slow-corrosion	Standard	Nitrided
	Low filler content (up to 30%) and low-corrosive	Standard	Standard	Fully hardened, high-alloy steel or nitrided steel with hardened flights, slow-corrosion	Standard/powder metal, high-alloy	Bimetal
	Highly-filled (more than 30%) and corrosive	Standard	Standard	Powder metal, high-alloy, Carbide coating	Powder metal, high-alloy/coated	Bimetal with WCL*
Polymer materials with special properties	LCP	Standard	LCP geometry	Powder metal, high-alloy	Standard	Nitrided/bimetal
	Thermoset	Standard	Thermoset geometry	Fully hardened/ionitrided	–	Bimetal
	LSR	Standard	LSR geometry	Fully hardened, high-alloy steel	LSR tip	Bimetal
	PVC	Standard	PVC geometry	Chrome plated	PVC tip	Bimetal
	Shear-sensitive polymers	Standard	Low-compression screw	Fully hardened, high-alloy steel or nitrided steel with hardened flights	Standard	Nitrided/bimetal
Applications with special requirements	Crystal-clear applications	Standard	Standard	Coated, e.g. TiN or CrN multi-layer)	Standard/** coated	Nitrided/bimetal
	High-speed applications, with or without pigment concentrate	High-performance	High-performance screw or 25 D barrier screw	Nitrided steel with hardened flights	Standard, optional ball non-return valve	Bimetal
	Direct masterbatch colouring	Standard	20 D mixing screw	Fully hardened, high-alloy steel or nitrided steel with hardened flights	Standard	Nitrided/bimetal

* Alloy with tungsten carbides ** Optional, non-return valve with servo-control ring

Orientation guide for selection of screws, cylinders and non-return valves.
Please consult our Sumitomo (SHI) Demag service team for special applications.

MADE BY SUMITOMO (SHI) DEMAG



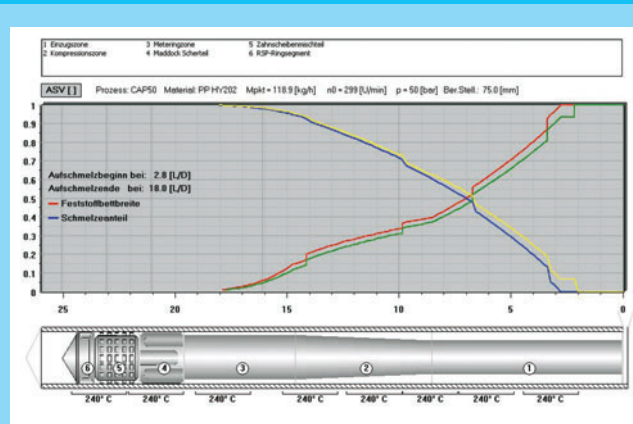
Premium technology is not enough – Competence for solving individual application problems

Increasingly complex plasticising technology demands ever more specific expertise. This calls for a close cooperation between injection moulding companies, plastics producers and developers – and more often than not, the advice of process engineers is needed, for example when it comes to the processing properties of a new polymer material.

As a user of Sumitomo (SHI) Demag screws you can benefit from the extensive expertise of our engineers. Our team of specialists will help you solve problems such as the significant increase or reduction of your injection units short weight by providing a scaled-up or scaled-down plasticisation unit to suit your machine.

Contact us!

We have an answer to your plasticisation problems.



Computer-based simulation of plasticising processes at Sumitomo (SHI) Demag



State-of-the-art machines and manufacturing equipment for screw production



Competence centre for screw production at Schwaig/Germany

Original parts of certified quality

Ever more exacting demands on plasticising systems require ongoing improvement of all involved components. Therefore, our team of engineers develop state-of-the-art plasticising components to cater for the leading edge of the market – always in close cooperation with the customer, since they are best able to specify their requirements regarding screws, cylinders, tips, non-return valves or mixing sections.

State-of-the-art plasticising components

With its screws and components for all areas of application from development to large-scale production, Sumitomo (SHI) Demag is at the leading edge of technology and provides state-of-the-art quality in the following areas:

- Geometric design based on experience
- Metallurgy and material selection

- State-of-the-art production techniques
- Hardening and surface finishing
- Pilot plant testing
- Analysis with computer-based simulation programs.

Short delivery times – even for special constructions

At Sumitomo (SHI) Demag's competence centre in Schwaig/Germany, our team of specialists manufactures a large number of screws and cylinders – not just for Sumitomo (SHI) Demag injection moulding machines. The high production capacity and versatility of our equipment ensure minimum delivery times even for special constructions.

Guaranteed parts supply even for older machines

The availability of all machine data and the capacity of the production facilities guarantee a reliable parts supply for screws from older machines such as the D series and the supply of customised geometries which were ordered at a later date.

SOLUTIONS FOR EVERY PROBLEM

Bimetal plasticising cylinder

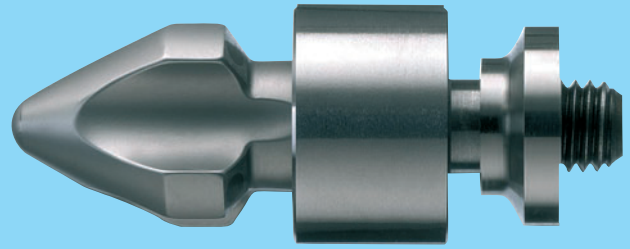
- With different hard-materials alloys (e. g. tungsten carbides)
- 20 D or 25 D
- 25 D for high-performance screws
- Multi-purpose
- For polymer material with abrasive filling or reinforcing agents
- For polymer material with corrosive additives

Nitrided plasticisation cylinder

- 25 D
- For unfilled, non-abrasive polymer material

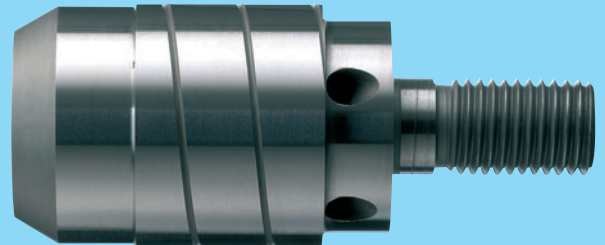
In addition to bimetal or nitrided plasticising cylinders, Sumitomo (SHI) Demag offers cylinders to suit specific applications:

- Thermoset cylinders with liquid temperature control
- High-pressure cylinder up to 3,100 bar
- High-temperature units up to 450 °C



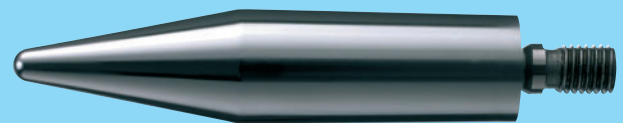
Non-return valve

- High residence times due to careful material selection and design
- Outstanding clamping performance
- Low flow resistance



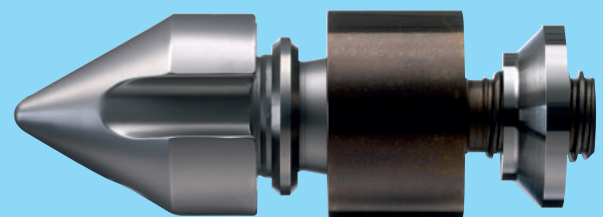
Ball non-return valve

- Fast reaction and clamping
- Recommended for low-viscosity polymers (e. g. polyolefin) and high-speed applications
- Low-wear design



PVC screw tip

- Low-corrosion due to chrome-plating
- Gentle processing due to favourable flow design



Non-return valve with servo-control ring

- Very good response, also at low injection speeds
- Specially suited for "crystal-clear" applications (e. g. for PC, PMMA)

Cylinders, screws, equipment

Original Sumitomo (SHI) Demag components for plasticisation systems provide a consistent premium quality. We have the right equipment for every application from complete plasticisation units for individual components such as screws, tips, non-return valves or shear and mixing sections.



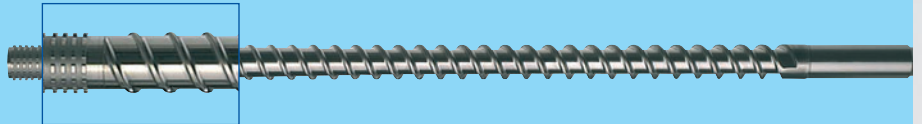
Standard screw

- Three-section screw
- Fully hardened
- Plasma-nitrided, with hardened flights
- For processing most polymer materials with a low filler content
- Wide processing window
- High throughput rate



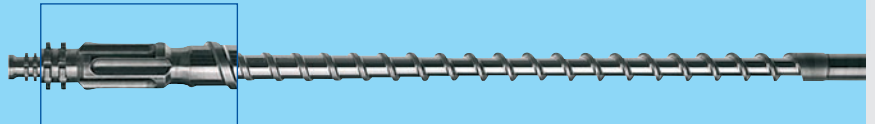
Double-flighted screw with mixing section

- Improved plasticising performance
- Excellent mixing performance in connection with shear or mixing section



High-performance screw with shear or mixing section

- Plasma-nitrided, with hardened flights
- High throughput rate of required melt quality
- Favourable dispersion for direct colouring by shear or mixing sections



Barrier screw

- Plasma-nitrided, with hardened flights or chrome-plated, with hardened flights
- Available up to 25 D
- Maximum melt throughput rate
- Gentle material processing
- High-quality melt
- For high-speed applications such as buckets, screw caps etc.



PVC screw with tip

- Chrome-plated for corrosion protection and reduced material plate-out
- Gentle plasticising and homogenisation
- Favourable flow design



Thermoset screw

- Fully hardened and ionitrided
- For filled and abrasive thermo-set compounds
- Non-compressing geometry



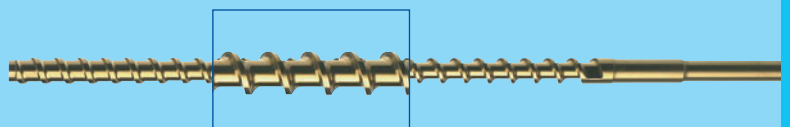
Other screw geometries are available for special materials such as liquid silicone rubber (LSR), liquid crystal polymers (LCP) and elastomers

Screws with special geometries made from selected materials or coatings to suit individual applications:

- Screws with hard-materials coating for abrasion protection, e.g. chrome nitride (CrN) or carbide coating
- Highly wear-resistant powder metal screws
- Chrome-plated screws
- Plasma-nitrided screws or screw with hardened flights

Screws with titanium nitride coating (TiN)

- very hard surface
- for crystal clear applications, e.g. PC or PMMA
- Surface with low polymer adhesion
- Surface with plate-out protection



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Power for your competitive edge

High speed, flexibility, maximum output – playing in the premier league of plastics processors requires smart budgeting. This is where **ErgoService** comes into play: a comprehensive package of technical services across the entire lifecycle of your line.

Customised **ServiceTools** for maintaining the value of your equipment, **ErgoParts** for high-speed spare parts delivery and **RetroFit Tools** for upgrading your injection unit, clamping unit and control unit at minimum expenditure. Fast, inexpensive **Training** for your employees.

In short: An intelligent service concept providing individual support focused on your financial benefit. For maximum machine efficiency. For maximum production economy and a competitive edge.

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We are at your service.**

