



Screws and Barrels



Engineered for
brilliant plastics



A man with short dark hair, wearing a white long-sleeved shirt, a blue patterned tie, and a brown leather belt, stands with his arms crossed in a factory setting. He is smiling slightly at the camera. The background shows industrial equipment, including blue and orange metal frames and rows of silver coils.

we> welcome you

Ersin Cuğ
Sales Executive



Enformak was found in 1980 as a workshop, producing spare parts for plastics and rubber processing industry, has been earning recognition as leading manufacturer of screws, barrels and essential components of plastics processing machines. Since then, a workshop has turned into an innovative company with highly qualified staff. Co-operation with raw material manufacturers and research institutes enables our technical department to design the newest technology and provide solutions for our clients' complex processing problems.

From the start, we concentrated our development effort on modifying screws and barrels for better wear resistance, higher performance, lower energy consumption as well as different surface treatment and coating methods.

Our aim is to be; continuously renewing, customer oriented, leading organization in improving and growing plastics processing industry using our experience, quality intelligence and technical know-how.

we provide solutions for our clients' processing problems.



1980› Enformak was established. Enformak was established in 1980 as workshop. In the beginning, we were serving in small product range.

1991› The very first exportation. We entitled to our exportation cocket and it is time to open up to the world. In this year, our very first export was to Libya and we achieved a goal.

2000› From a workshop to a plant. Renewal. We accelerate in our journey. It has been 20 years since we were established. Deciding for a renewal in order to compete with the world.

2007› The second technology era starts. We have learned how to compete with the world and by this year we have started our second breakthrough of technology that is used only by exclusives.

2008› Institutionalization time. Time to change. Our new aim is modern management approach. We have started Institutionalization studies. Our partner in Institutionalization studies is a leading office in Turkey which serve giant companies. We are ready for the new standarts in management.

2016› We are in the world stage. By today, we serve to thousands of plants in USA, Russian Federation, Holland, Saudi Arabia, Brasil and many other countries. Proud to be the most confident partner of these manufacturers. The adventure that has started 36 years ago is today a bigger challange.

2023› Our target is to pioneer. We set sight on being the world's leading screws and barrels manufacturer and promise to wave the flag of our homeland in all over the world.

2023›
Our target
is to pioneer.



barrels»



range»

Single Screw Barrels
Twin Screw Barrels
Degassing Barrels
Double Diameter Barrels for Recycling
Abrasion Resistant Liners and Bushings
Water Cooled Barrels
Bimetallic Barrels
Grooved Feed Barrels

barrels»

Barrels for Injection Molding»

Increasing the variety of the raw materials used in injection molding, meeting higher pressure and higher speed requirements, maintaining the advantages of the injection molding technology and removing the possible subsequent disadvantages may only be possible by using the correctly selected materials, hardening methods and designs. It is very important to use the correct material and hardening method related to the material and processing conditions. Optimum selection of materials and methods will enable machines to operate for longer time with minimum malfunctions even for the use of highly corrosive and abrasive materials such as fiber reinforced materials. We provide the most appropriate solution among our product range that best fit your processing conditions.

Barrels for Extrusion»

Extrusion technology is the largest share of the plastics production. We offer you all barrel designs used in extrusion. Barrel designs are generated in accordance with various process requirements will meet your demands and give you the best solutions with a method that is created by the combination of experience and know-how.

Grooved Feeding»

For feeding of the hard-to-feed, materials such as high molecular weight polyolefin or grinded, scrap materials we offer hard grooved-feed barrels with deep conical grooves at the feeding zone and spiral water cooling grooves close to the inner surface. Grooved feed barrels provide; almost 60% to 70% higher capacity, counter pressure independent output rate, higher output stability.

Grooved feed barrels»

60% to 70% higher capacity,
counter pressure independent
output rate, higher output
stability.



barrels›

Twin Screw Barrels›

Twin Screw Barrels which are used to provide higher dispersion, mixing quality solutions and high capacity especially for blended materials like PVC and different additives must be manufactured precisely. For the production of twin screw barrels, we use CNC controlled machines which is designed for twin hole barrel drilling and honing process. It provides high precision machining in center distance, diameter and axis parallelism capabilities to allow harmonious operation of screws like gears. By using CNC controlled machines, drilling and honing operations are carried out precisely. Net axis parallelism and centering without dismounting and displacing the barrel piece in one time is possible with this technology.

Barrels for Rubber›

The barrels for rubber that are manufactured for optimal processing of highly corrosive elastomer materials contain hardened tool steel bushings with high abrrasion and corrosion resistance. This design of our standart barrels provide easy and cost-effective repair solutions in case of repair. The special design of the feed pocket and the forced feeding section allows efficient feeding of the hard-to-feed rubber stripes. Water cooling of the barrel covering whole barrel including the feeding zone provides efficient processing of the rubber.



Twin screws barrels›
Using CNC controlled machines, drilling and honing operations are carried out precisely.



materials and wear resistance»

The common problem of all plastics processing machines mainly in injection molding and extrusion applications is the abrasion and corrosion and therefore inefficiency of those parts and equipments of the machine that come in direct contact with the processed raw material due to reasons such as high pressure, high temperature, abrasive and corrosive additives and misuses.

Our Research&Development Team which is continuously improving new projects, thereby we are able to use materials with long service life and hardening methods.

Standart Nitrided Barrels»

The single screw extrusion and injection barrels are usually made of nitriding steels (1.8550, 1.8509, 1.7225) and are manufactured with diameters of Ø16 mm to Ø250 mm and a max. length of 4000 mm in one piece. The barrels made of nitriding steels are case hardened by long duration nitriding.

Through Hardened Barrels»

Our barrels that are made of tool steel can be supplied with the diameter up to 35mm on length to 700mm. The barrels are hardened as two steps, through hardening and nitriding.

Norm	Material	Heat Treatment	Hardness	Tensile Strength (N/mm ²)-(RT)	Hardness Depth (mm)
1.7225 (4140)	42CrMo4	Nitrocarburising /Induction	560-630 HV5/ 54-58 HRc	800-950	0,2-0,3
1.8550	34CrAlNi7	Gas Nitriding	900-1050 HV5	850-1050	0,5-0,7
1.2379	X155CrVMo121	Through Hardening	58-62 HRc	N/A	Through Hardened

Standart Nitrided Barrels»
Ø16 mm to Ø250 mm and
a max. length of 4000 mm
in one piece.



materials and protection against wear›

Abrasion Resistant Bimetallic Barrels›

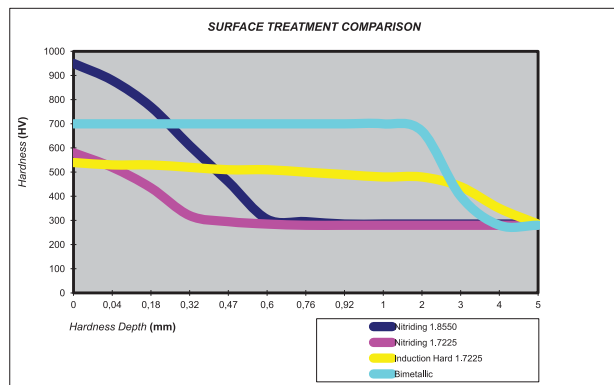
The increase in variety of the plastics materials and the use of highly abrasive and corrosive materials such as glass fiber, calcite, dyes and other additives mostly shorten the life of barrels and cause great deal of time. We offer you the bimetallic barrels that is ultimately abrasion and corrosion resistance. It also allows long-term operations without any production and quality loss. The barrels which are made of steels with higher mechanical strength are turned into bimetallic form by being coated with abrasion and corrosion resistant special alloy materials on the inner surfaces.

Three different alloy options like Fe-Cr based, Ni-Co based and Ni based alloys can be selected according to the requirements so that corrosive and abrasive effects can be minimized.

Material	Yield Point at RT (N/mm ²)	Yield Point at 300°C (N/mm ²)	Application
M 36	800	360	Extrusion
M 58	900	580	Injection Molding

Bimetallic barrels have an abrasion resistant coating depth of 2-3mm while the nitrided barrels have a hardness depth of 0,5-0,7mm and the life of bimetallic barrels is 2 to 5 times longer than standart nitrided barrels depending on the processing conditions.

Protection Type	Base Alloy	Alloy Comp.	Wear Resistance	Corrosion Resistance	Hardness-RT (HRC)
KF 121	Fe	Cr, Mo, Ni, Bi, C	***	***	64-69
KN 115	Ni	Cr, Mo, Co*, B	*	*****	49-53
KN 216	Ni	Cr, Mo, Co, B, W*, C	*****	****	53-57



Bimetallic barrels›

Have an abrasion resistant coating depth of 2-3mm while the nitrided barrels have a hardness depth of 0,5-0,7mm.

how we focus»

We have been producing plasticising screws, barrels and various auxiliary equipments in our plant by using the advanced technology in each phase of production. We do this by using special CAD-CAM design and production softwares, engineers, designers, and technical team who have extensive know-how and experience. We focus on high quality in line with the EUROMAP criteria and the quality policy. In order to ensure maximum efficiency for barrels service life in every kind of plastics processing machines, it is critical to choose the most appropriate material and hardening method depending on your processing conditions. We offer you the most appropriate solution in our wide product range that includes barrels, the most cost-effective nitrided barrels or durable and long-life PM (Powder Metallurgical) steels, special tool steels and bimetallic barrels which are all subjected to controls in each phase of production.

Close follow-up»

The barrels, screws and other equipment that cause inefficient operation do not function with the desired level of performance or become unusable due to different reasons during injection moulding and extrusion applications; are checked by our experienced technical team and the needs are reported.

We archive all the projects with customer details in our system and call back when necessary. We are able to screen renewal periods of the projects we archive. This allows us to provide correct and clear information for our clients and to inform about the detected damages and possible damages that may occur.



Systematic R&D studies»
devoted to manufacturing
out-standing performance
plastification units.



screws»



range›

Standart Screws
Integrated (EBM) Barrier Screws
Twin Screws
Bimetallic Screws

screws›

Standart Screws›

The processing technology and design advantages of the basic three stage screws produced for general use are used in processing all kinds of thermoplastics and rubber materials by means of extrusion and injection molding. Conversion of these raw materials into ready-to-mold melt. Depending on the specific requirements of raw material and final product, screws designs also offer various mixing section as an option.

Integrated Barrier Screws›

Grinded and/or recycled plastics with low MFI value are hard to feed, move and melt. Therefore they offer low level of efficiency in processing. In order to eliminate problems resulting from such characteristics and to improve melting capacity and quality, we manufacture Barr and Maillefer type EBM screws.

EBM screws designed for extrusion and injection molding applications may contain some additional dispersive mixing section that provides more intense mixing capability for blends and agglomerate components.

Barrier design screws which separate molten plastics from solid plastics offer these advantages›

- ›Stable output
- ›Minimal pressure and melt temperature change
- ›Higher melt quality and lower melt temperature
- ›Better dispersive mixing
- ›Better results for processing of recycled or grinded materials

Additional usage of a distributive mixer provides more intense distributive mixing capability and also used for effective distribution of pigments, dyes, UV stabilizers, slip and anti-block additives. Barrier flights in injection molding and extrusion screws are good dispersive mixers which are especially effective for recycles or regrinds. Distributive mixing section combined with polymeric compression. They are recommended for short screws for processing low MFI materials. Pulsating mixers for deeper channel, low compression extrusion and injection molding screws and the result is excellent without shear. These kinds of mixers can be applied to both extrusion and injection molding screws. Special 3D mixing sections provide high mixing performance and high dispersing capability. Spiral dispersive section performs similar function as barrier screws at the fraction of the cost. These screws run very well with resin families that are not difficult to feed and flow easily.

EBM designs which are also applied to injection molding screws offer these advantages›

- ›Shorter cooling time and lower part deformation with lower temperature and better melt quality
- ›Less additives and color masterbatch requirements due to better mixing and dispersing capabilities
- ›Reduced high counter-pressure requirement, faster thus shorter cycle times materials

screws›

Twin Screws›

In blends and in hard-to-process powder PVC materials processing, twin screws are used for high melting and output capacity requirements.

Twin screws are processed in the special CNC Screw Cutting Machines and screw pitches are positioned sensitively and they geared one to another optimally. Flank clearances, lateral pitch angles and depth of the channels are the same through screws. It provides the material to flow uniformly.

Twin screws› are machined precisely, so the flight profiles fit closely into channel profiles, ensures precise pairing.

Bimetallic Screws›

Highly abrasion and corrosion proof bimetallic coating options are available for twin screws as well. Bimetallic twin screws have longer service life especially for dry blend PVC applications including abrasive fillers.

Screws are turned into bimetallic structure by hard facing the tops of flights. The coating meets the requirements of the wear resistant screws against abrasion and corrosion. Bimetallic screws prevent long term production losses.

Screws that are usually made of alloy steel are turned into bimetallic form on our CNC controlled PTA (Plasma Transfer Arc) welding machine by applying special powder metal alloys with high abrasion and corrosion resistance.

Twin screws›

Highly abrasion and corrosion proof bimetallic coating options are available for twin screws.





Murat Yağcı
Technical Team Member

materials and protection against screws wear

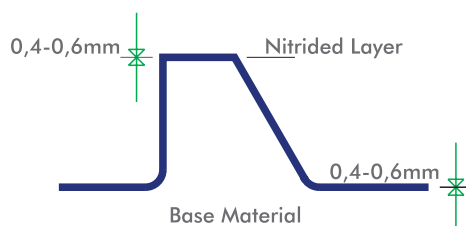
Standart Nitrided Screws

In standart applications, extrusion and injection molding screws are usually made of nitriding steels and can be manufactured with diameters from Ø16mm to Ø250mm and a length of 4000mm. Hardened by long duration nitriding.

Norm	Material	Heat Treatment	Hardness	Tensile Strength (N/mm ²)-(RT)	Hardness Depth (mm)
1.7225 (4140)	42CrMo4	Nitrocarburising /Induction	560-630 Hv5/ 54-58 HRc	800-950	0,2-0,3
1.8519	31CrMoV9	Gas Nitriding	750-850 HV5	900-1100	0,3-0,4
1.8550	34CrAlNi7	Gas Nitriding	900-1050 HV5	850-1050	0,5-0,7
1.2379	X155CrVMo121	Through Hardening	58-62 HRc	-	Through Hardened
PM Steel	-	Through Hardening	54-64 HRc	-	Through Hardened

Through Hardened Screws

Screws made of tool steel can be supplied with diameter upto Ø25mm to Ø70mm and a length of 1850mm. Screws in this group are good option for long service life especially in injection molding applications in which abrasive additives are used.



Surface Coatings of Screws

Different composite coating application -mainly hard Chrome- with surface coating methods on screws which are used in processing of highly corrosive materials such as PVC provide advantages for certain applications. Some other advanced coating for corrosion and abrasion prevention can be used as well.

Coating Type	Coating Thickness	Hardness	Wear Resistance	Corrosion Resistance
Hard Chrome Plating	200-300µm	800-1000 HV	****	**
WC Plating	250-300µm	900-1050 HV	*****	****
TiN Plating	3-4µm	2500 HV	**	*****
Crn Plating	3-4µm	3400 HV	**	***
AlTiN Plating	2-3µm	3000 HV	****	***



materials and protection against screws wear

Abrasion Resistant Bimetallic Screws

The increasing variety of plastic materials in extrusion and injection molding applications and the use of abrasive-corrosive additives shorten the life time of screws.

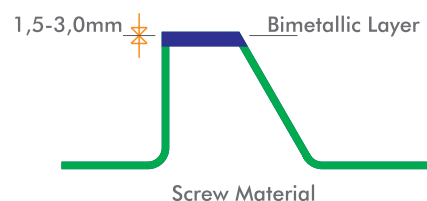
Screws are turned into bimetallic structure by hard facing the tops of flights. The coating meets the requirements of the wear resistant screws against abrasion and corrosion. Bimetallic screws prevent long term production losses.

Screws that are usually made of alloy steel are turned into bimetallic form on our CNC controlled PTA (Plasma Transfer Arc) welding machine by applying special powder metal alloys with high abrasion and corrosion resistance.

In order to minimize the rate of abrasive and corrosive wear, flights of the new and repaired screws are coated Fe, Ni, Co based metal powder alloys.

Protection Type	Base of Alloy	Components	Hardness (RT)	Wear Resistance	Corrosion Resistance
VF 12	Fe	C, Si, Mn, Cr, Mo, V, W	56-60 HRc	***	***
VC 12	Co	C, Cr, W	48-50 HRc	***	****
VC 1	Co	C, Cr, W	52-57 HRc	****	****
VN 56	Ni	C, Si, Cr, B, Fe	50-55 HRc	****	****
VN 57	Ni	C, Si, Cr, B, Fe, W	50-52 HRc	****	*****
VNW 83	Ni	C, Si, Cr, B, Fe, W	56-60 HRc	*****	*****

While screws hardened with standard nitriding have a hardness depth of 0,4-0,7mm, bimetallic screws have highly abrasion-resistant metallic powder layer welded by PTA (Plasma Transfer Arc.) with this method, the life of screws become 2-4 times than ordinary screws.



Pioneer PTA Technology
Discover bimetallic screws
and barrels.
Ultimate abrasion resistance.



screw tips, non return valves and nozzles›

The injection molding non-return valves and nozzles that are especially designed (with ball bearing, mixer, valve etc.) by our R&D department and Technical Team with optimal barrel and screw dimensions to meet different requirements of our clients provide excellent performance and solution quality with all kinds of thermoplastics.

Norm	Material	Heat Treatment	Hardness	Hardness Depth (mm)
1.2344	X40CrMov5	Through Hardening	52-54 HRc	Full section
1,2379	X155CrVMo12	Through Hardening	58-62 HRc	Full section
1.3343	X35CrMo17	Plasma Hardening	1000-1050 HRc	Full section
PM Steel	-	Through Hardening	54-64 HRc	Full section

The non-return valves and nozzles are designed in different types (ball check, mixer, shut-off etc.) by our Research and Development department. They provide excellent performance and melt quality with all kinds of thermoplastics.

Delivery dimensions of valves are Ø16mm-Ø250mm highly alloyed tool steels through hardened and gas nitrided to 68-70 HRc.



Non-return valves›
and nozzles are designed in different types (ball check, mixer, shut-off etc.)



repair service›

The barrels, screws and other equipment that cause inefficient operation do not function with the desired level of performance or become unusable due to different reasons during the injection and extrusion applications; are controlled by our experienced technical team and the needs are reported.

We archive all the projects with customer details in our system and call back when necessary. We are able to screen renewal periods of the products we archive. This allows us to provide correct and clear information for our clients and to inform about detected damages and possible damages that may occur.

Barrel Repair›

Barrels which are within the limits of abrasion, scratches and damages are re-processed on special deep drilling, boring and honing machines and again hardened. Special through hardened liners could be used especially for injection molding barrels for long life repairs.


Screw Repair›

The screws which are within the limits of abrasion, scratches, damages, fractures or damaged flights are subjected to be repaired by welding on the top of the flights by applying abrasion and corrosion resistant Fe, Co or Ni based different alloys on our CNC-controlled special PTA (Plasma Transfer Arc) and grinding to be restored to nominal diameter. If it is necessary the screw is being nitrided again. Our repair service also includes design changes and/or extra unite additions (mixers, kneaders, maddock etc.) by our technical department within the set limits for those screws which have not been exposed to any abrasion and corrosion but still cannot provide the desired level of efficiency. In additional, broken shafts and broken tie-bars can be repaired. All kinds of keys or spline revisions, screw surface coating and polishing, straightening of bended screws, non-return valves, nozzles can be repaired or remanufactured .

Our repair service›

includes design changes and/or extra unite additions like mixers, kneaders, maddock.





The light of technology
PTA



Tetraco

A member of
Tetraco Group

Turkey

Discover
the potential

