

ENGI- NEERING LIFE

PROCESSING GUIDE
FOR EXTRUSION



Find out more about
your TPE solutions
partner now.

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ENGI- NEERING LIFE

Science has made us understand the world. However, engineering has changed the world by taking knowledge and putting it into practice. It was engineers who wrote history and integrated knowledge into life.

Elastron, a global industrial company, is a daily life engineer with solutions that touch and improve many aspects of life. Although it produces high-tech thermoplastic elastomers for industrial companies, its expertise continuously improves life through different products and services.

Elastron is not just a competent manufacturer. Elastron produces to enhance everyday life.

Everyday Life Engineering Partner of Global TPE Users

Elastron is the developer of products that touch human life and make everyday life easier by using thermoplastic elastomers. Elastron is the world's TPE specialist. It always aim to improve life.



GLOBAL

Elastron has a global service network that can serve more than 55 countries.



SOLUTION PARTNERSHIP

Elastron has a business-service partnership philosophy beyond product supply.



PROACTIVE

Elastron goes beyond the customer's current needs by combining its worldwide product, service and knowledge with its agile structure.

About TPE

TPEs are rubberlike materials that can be processed on any plastic machinery. They enable higher savings on processing costs compared to vulcanized rubbers, consequently increasing company's profits. Although they have functional characteristics similar to vulcanized rubbers, the production and investment costs are lower.



TPEs offer low density, wide hardness range, weathering and temperature resistance, recyclability, good compression set and easy coloring.



Temperature Resistance



Weathering Resistance



Recyclability



Wide Hardness Range



Easy Coloring

Developer of Products That Touch Human Life



Elastron's main production facility in Gebze, Turkey, is at the intersection of the East and the West. It offers logistical advantages with land, sea, and air routes.

Elastron second production facility is in Gainesville, Georgia, USA and serves the North American market with warehouses in the East and the West Coasts of the United States.

Elastron has offices in China, Taiwan, and Japan for the Asia Pacific market. It also uses a Germany office to provide solutions to the European market.

Elastron's Quality Approach

Elastron devotes significant resources to technical developments of new products and applications to meet market demands and customer needs. A core value of Elastron is superior customer service, and significant resources are devoted to ensure maximum customer satisfaction.

Elastron has obtained all the key quality management systems. The Quality Management System (ISO 9001:2015) ensures that Elastron supplies all the products with consistent quality that meet customer requirements.

Elastron is also accredited by the Automotive Quality System (IATF 16949:2016) ensuring high quality production and supply to the automotive market.

Occupational health and safety practices of Elastron are certified with ISO 45001:2018.

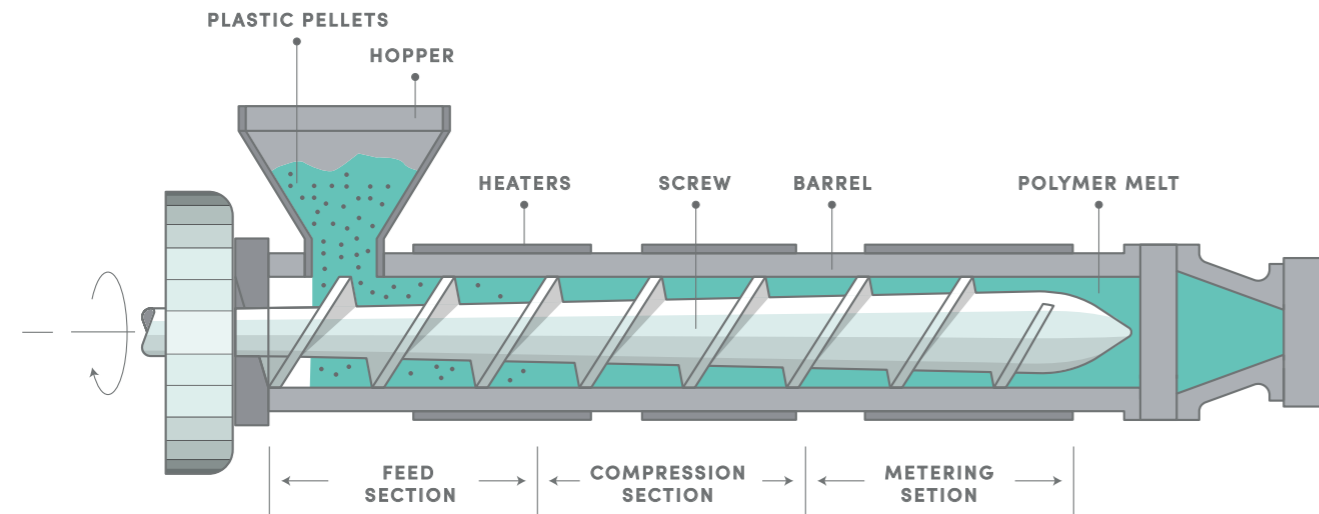
The latest achievement is the certification of Elastron according to ISO 14001:2015 Environmental Management System, which demonstrates our strong commitment to the environment.

Recently Elastron has expanded its global reach with special focus on North America and China. Today Elastron is serving over 55 countries with high quality products that meet customer needs.

Elastron R&D develops customer-oriented solutions in addition to its high-quality general product line.

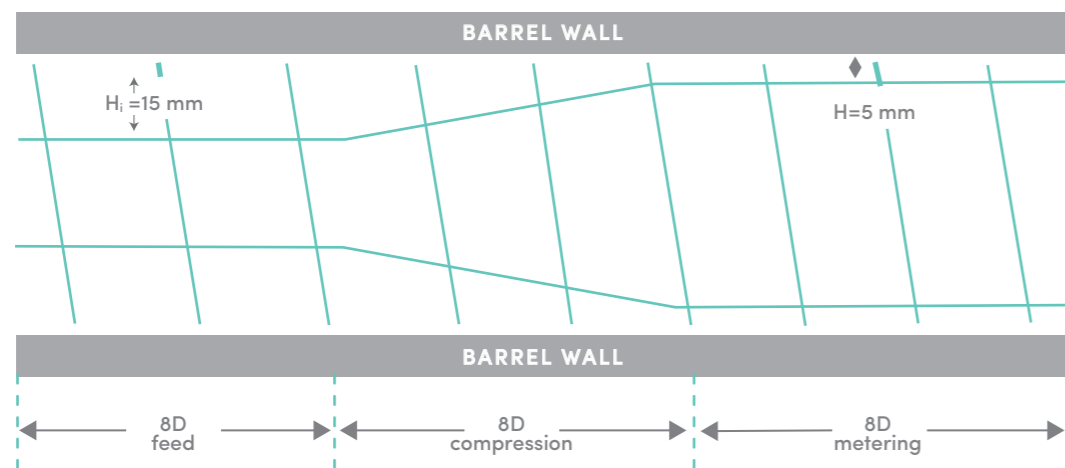


PROFILE EXTRUSION



Typical thermoplastic extruder

The selection of the extruder barrel diameter depends on the dimensions of the profile being produced. As the throughput increases, the diameter must be increased. A length to diameter ratio (L/D) of 24:1 is recommended. If a higher capacity is needed, L/D ratios of 30:1 are preferred as they deliver a higher output capability, a more uniform output rate, and a better melt quality with the proper screw design.



The extrusion of Elastron TPE products requires medium to high shear to plasticize properly (high shear for Elastron V products) and to ensure proper processing at the recommended temperatures. General purpose three zone screw designs (feed, transition/compression, metering) having a compression ratio of 2.5 to 3.5 with an L/D of 18:1 to 24:1 are recommended. Barrier screws, especially for Elastron V products, are used successfully and are recommended.

In order to change the melt flow from rotational to uniform laminar flow, there is a relaxation zone after the extruder barrel. During extrusion, the melt inside the barrel is compressed and stressed, and it requires uniform flow before profiling.

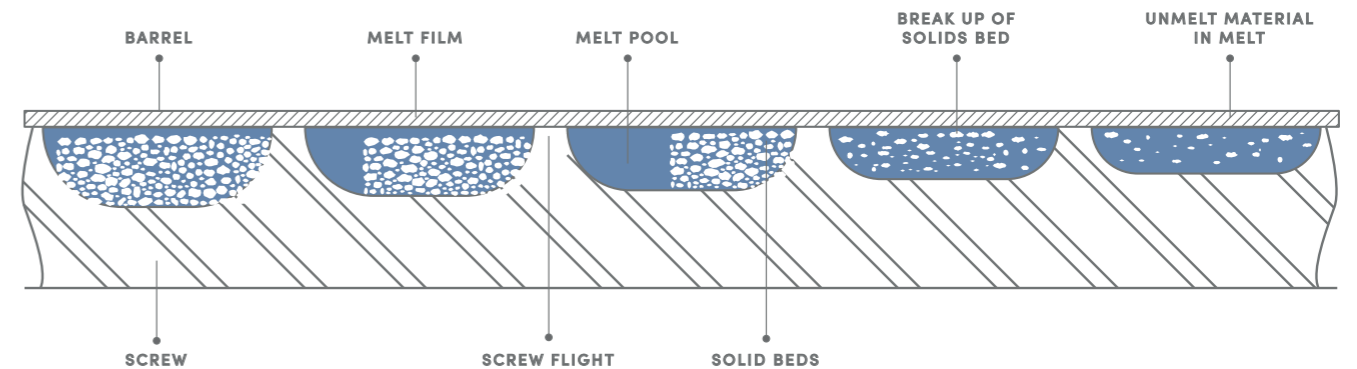
MATERIAL MOVING IN THE MOLD

The breaker plate must be used for screening. Special screens must be installed on the breaker plate to catch the foreign or burned particles coming from the screw or barrel inside. Depending on the extruder size and the capacity of the breaker plates, holes from 2mm to 4mm can be used, and 20 or 40 mesh screens are recommended.

The advantages of using screens:

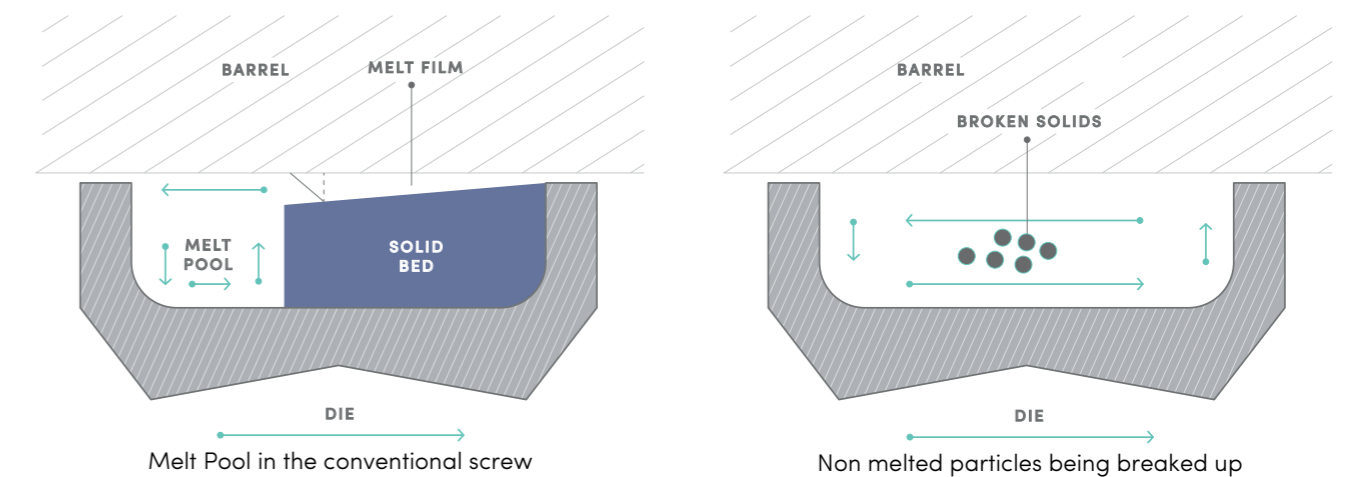
- Homogenize melting due to pressure
- Catch burned particles coming from the screw,
- Catch unmelted particles due to non-uniform screw design,
- Increasing shear,
- Increasing the surface quality,
- Increased back pressure for better melt quality.

MELTING IN THE SCREW



From left to right during processing, melting takes place. The material being melted remains behind in the solid material. This is why, if we do not use a sufficient compression ratio and an appropriate length of the compression zone, there will be some unmelted material left in the metering zone. This would result in a rough surface on the profile. We must ensure that the material coming to the metering zone has been completely melted.

MELTING IN THE CONVENTIONAL SCREW

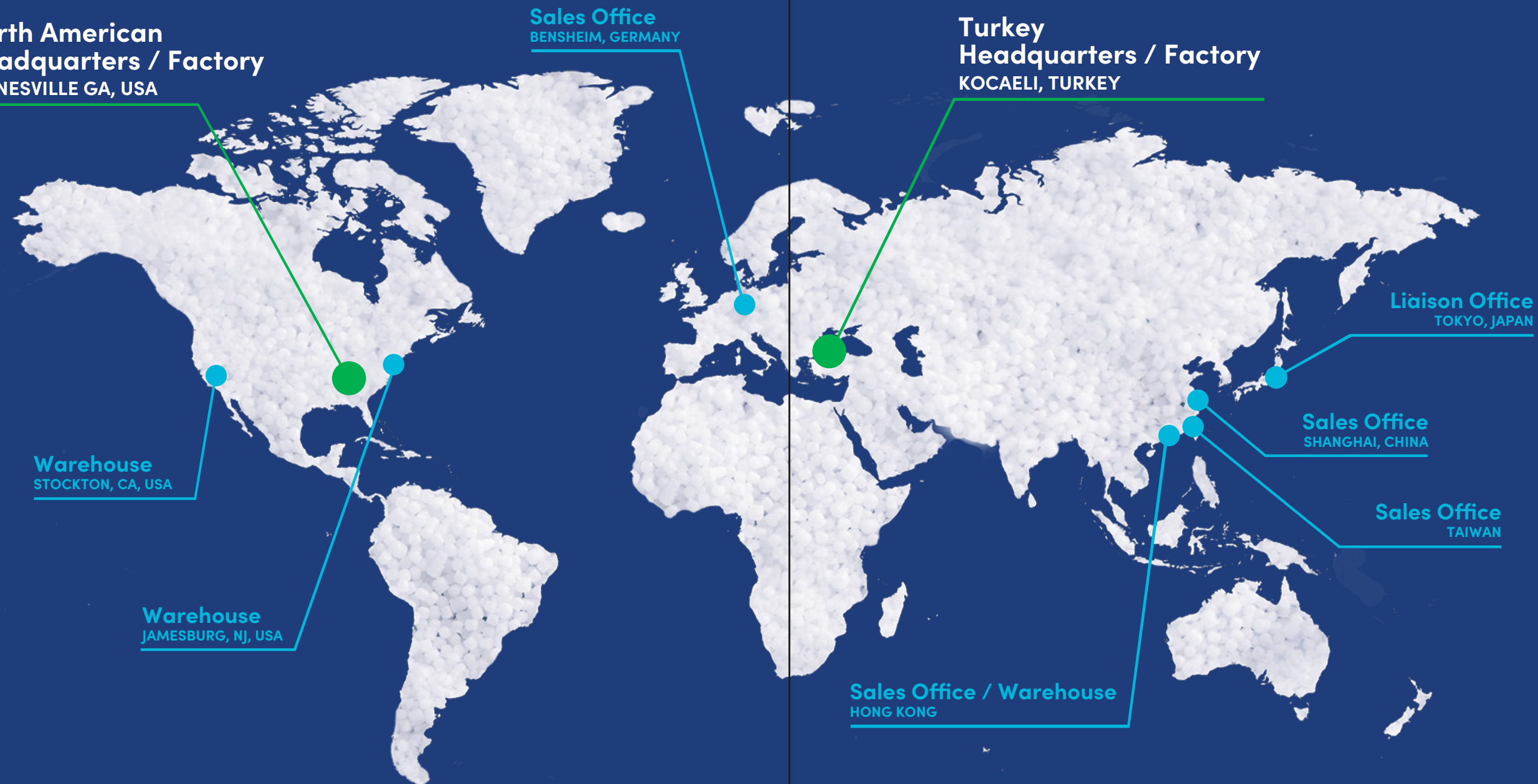




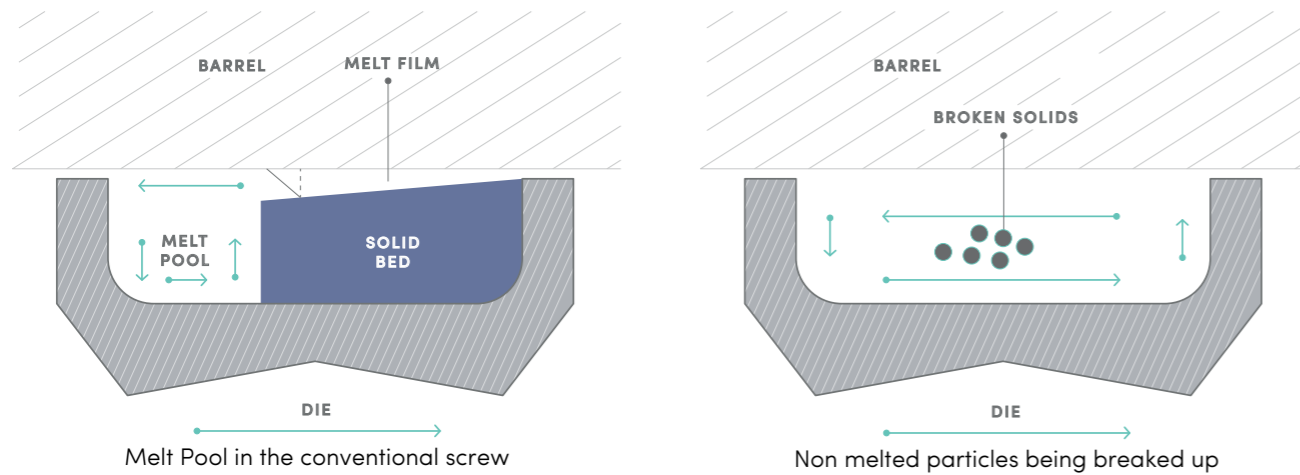
**North American
Headquarters / Factory**
GAINESVILLE GA, USA



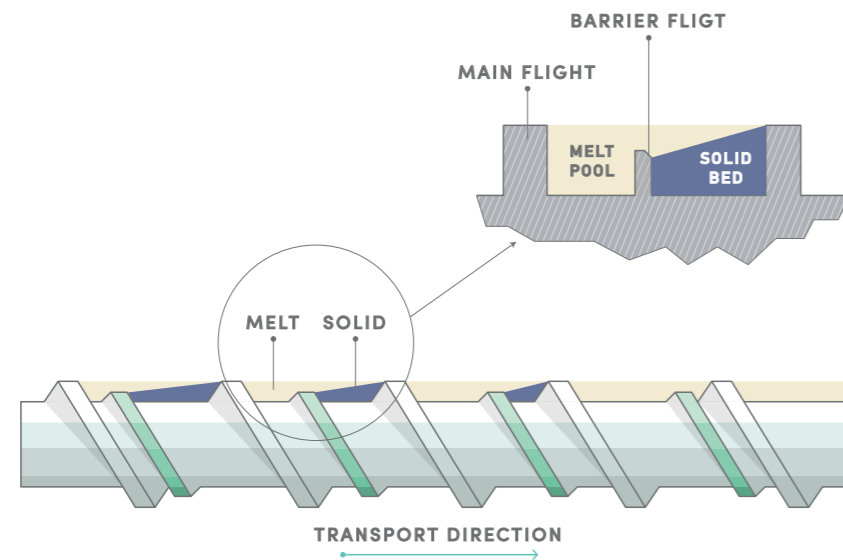
**Turkey
Headquarters / Factory**
KOCAELI, TURKEY



MELTING IN THE CONVENTIONAL SCREW



HOW TO GUARANTEE MELTING (BARRIER SCREW)



Extra barrier flights allow for extra compression during the melt transition from the filling to the metering zones. This compression provides extra melting due to the increasing shear.

TROUBLESHOOTING GUIDE FOR EXTRUSION

1. Interrupted melt output:

Unbalanced barrel temperatures.

- Reduce the feed zone temperature to feed the material to transition zone properly.
- Checked the temperature resistance and cooling system.
- Check the screen to catch the degraded, burned particles.

2. Surging: Due to contaminated material, wrong temperature settings, or an unbalanced die exit.

- Increase the barrel temperatures gradually equally for each zone.
- Check the screen and clean if it is blocked.
- Check for blockages in the hopper.
- Check the screw configuration.
- Clean the screw before production.

3. No Output: The die is blocked due to solidification.

- Check the material entrance from the hopper to inside the barrel.
- There might be a blockage inside the hopper.
- Increase the die temperature to dissolve the blockage.
- Change the screen.

4. Rough Surface due to unmelted particles:

- Check the screen if there are any tears.
- Increase the temperatures especially in the compression zone.
- Check the zone temperature resistance.
- If there are any crosslinked particles on the surface, reduce the screw rpm and the zone temperatures in order to prevent degradation.

5. Burned and discolored extrudate:

- Reduce the screw rpm.
- Reduce the barrel temperatures gradually until the right color is achieved.
- Select the extruder with a lower L/D ratio for production.

6. Die lines:

- Select the material with a lower viscosity.
- Increase the die temperature.

7. Melt Fracture:

- Reduce the barrel temperatures.
- Change the material in accordance with the die design.

8. Shark Skin:

- Reduce the rpm.
- Change the screen.
- Increase the melt temperature.

9. Fish eyes:

- Check the material and screen for contamination.
- The material must be dried properly before using.
- Reduce the temperatures to prevent material degradation.

10. Bubbles on the profile surface:

- Be sure to dry the material properly.
- Reduce the melt temperature.
- Reduce the screw rpm.

11. Warp: Insufficient cooling

- Increase the cooling bath length, and reduce the water temperature.
- Balance the die according to the part wall thickness.

12. Orange Peel surface:

- The die temperature is too low. Increase the die temperature.
- Increase the temperature of the zones that are close to die.