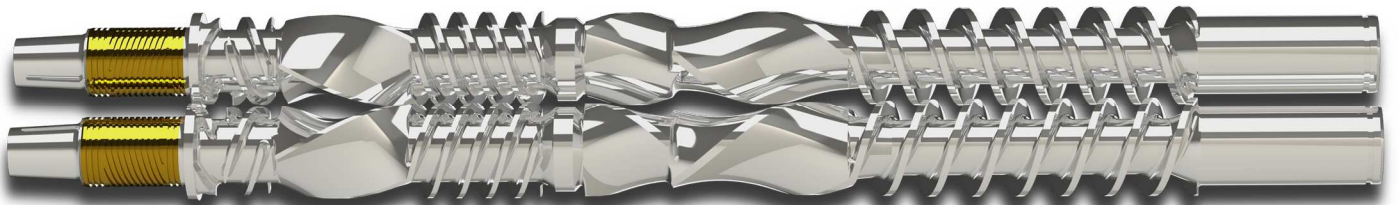


**GTS**



GERMANTWINSCREWS

# Screws and Barrels for the Petrochemical Industry



**Extrusion Technology is GTS - Technology**

## GermanTwinscrewS GmbH

Since 1995 we do continuous optimization in screw technology, for co- and counter rotating twin screws, intermeshing and non-intermeshing as well as for large single screws for compounding, injection moulding and rubber application. We take care of process energy optimization and take responsibility for all environmental aspects. Highest quality standards and reliability towards our long-term and new customers are the main focus in our company philosophy. Our customers are located in more than 100 countries.

- GTS creates international standards for highest melt quality
- GTS creates international standards for output maximizing
- GTS creates international standards for widest process window and longest screw lifetime



### Green German Technology

Green German Technology (GGT) is our motto. This enduring spirit of environmental awareness at GTS is a contribution to protect the quality of life for present and future generations.

Our thinking regarding the optimization and improvement of our product design as well as the training of our employees is characterized by sustainability and responsibility for our environment.

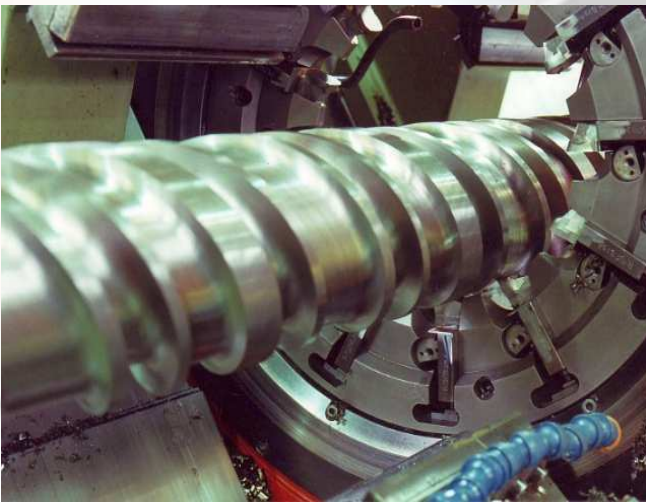
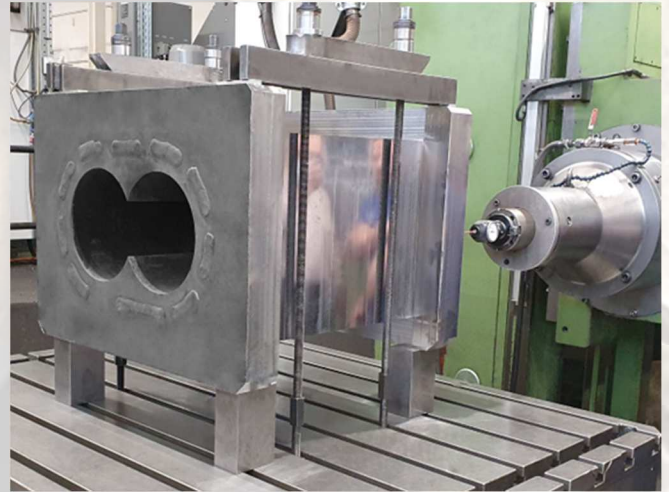
Parts of our profits are spent for local youth work as well as for donations regarding different social projects. Our social responsibility is one of our main priorities.

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## Processing elements for petrochemical industry

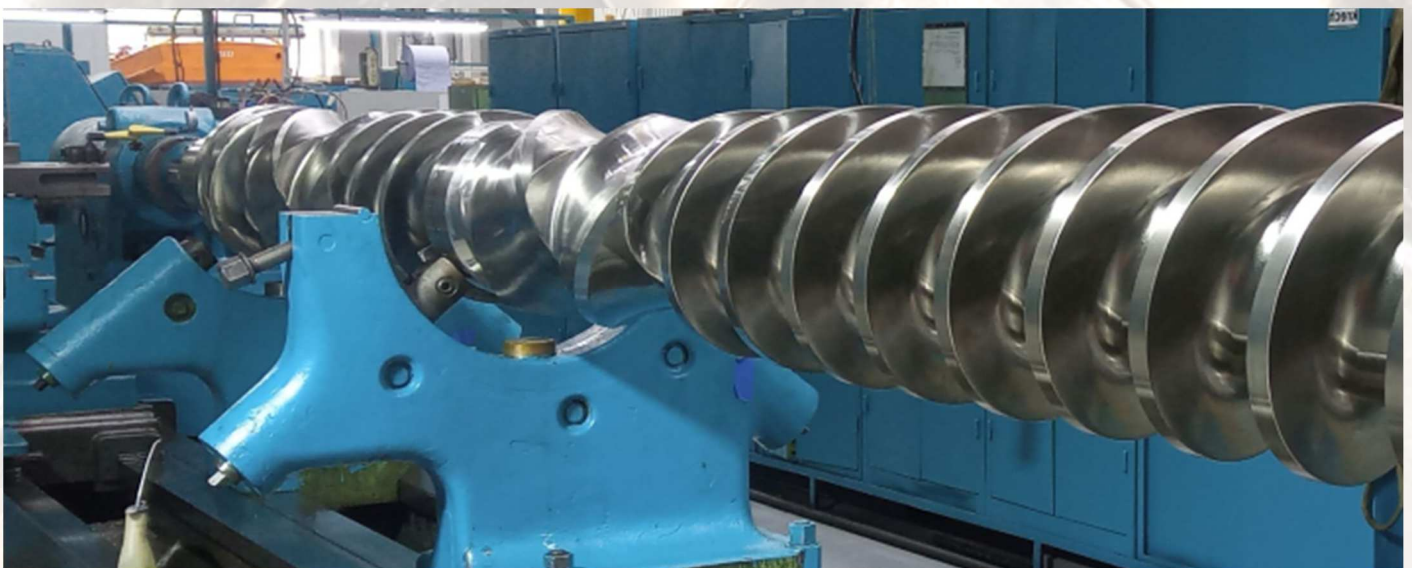
GermanTwinscrewS GmbH delivers screws and barrels, compatible to all international extruders and compounders in the Petrochemical Industry. GTS does optimization related to output maximization, quality enhancements and other customer requirements.

GTS has experience in worldwide applications and requirements regarding a wide range of demands in the Petrochemical Industry. Continuous developments in designing and manufacturing lead to best output and longest lifetime.



### Our Manufacturing Range

	Diameter/mm	length/m
Counter-rotating twin screws, intermeshing	max. 280	max. 9,5
Counter-rotating twin screws, non-intermeshing	max. 600	max. 9,5
Single screws (1 section)	max. 900	max. 9,5
Single screw elements	max. 380	max. 0,9
Barrel segments	max. 700	max. 2,0
Screw shafts (for screw elements)		max. 12

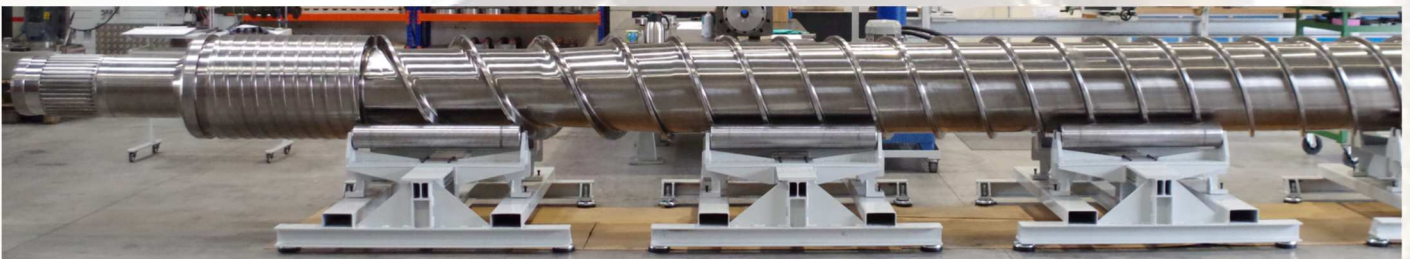


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## Large single screws and barrels

Many of the petrochemical resins for polymer material are made by single screw compounding. The main priority is high output and homogenization during this process. The screw itself can be fed either under pressure or non-pressure, fed with powder or a mix of liquid and powder or liquid polymer components. In length direction there could be a vacuum port. These screws are running mainly in the polyolefin polymerization, but you will find them also in the range of many other polymers.

The large screws often run with high rpm for many years without stopping. The geometry and compression ratio are designed for high output but also for clear and fish-eyes-free resin. The barrel is standard temperature-controlled by liquid systems.



GTS screws and barrels are made by high-alloyed steel and extra-depth nitrided, especially by gas nitration. Our GTS experts combine extensive steel know-how with a high expertise in screw design for polymers. The optimization of the screw and barrel design is our main strength but we can also make copies of existing processing units.

GTS manufactures all types of screws and barrels for extrusion, compounding and injection molding. This includes also large cooling screws for high-output foam applications.



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## Large counter rotating screws and barrels

In the year 1995 we started mainly in the business of counter rotating twin screws for PVC application. Over the years we got a wide range of customer requirements for higher output which guided us into the petrochemical industry with counter rotating twin screws and barrels.

GTS manufactures all sizes of counter rotating twin screws, intermeshing or non-intermeshing, inside or outside rotation. The screw design for large output in the polyolefin business allows outputs of more than 50 tons/hour. In the HDPE resin business for example, the 460mm non-intermeshing counter rotating compounders run with 200rpm and an output of almost 60 tons/ hour. The screws are made of one piece for this application.



For many technical polymers GTS manufactures smaller non-intermeshing screws made of several screw segments.

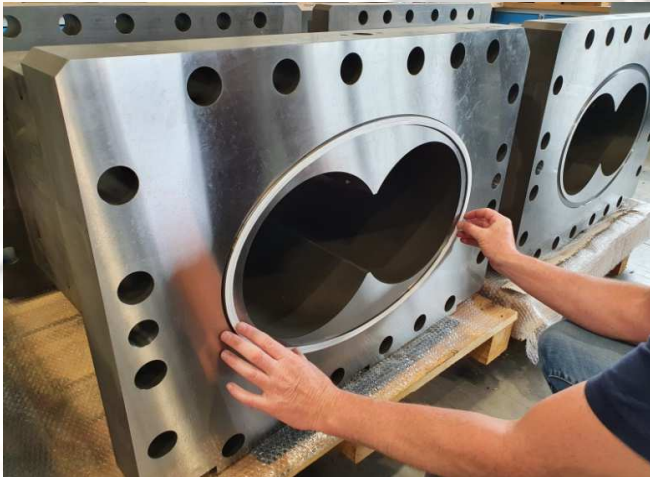
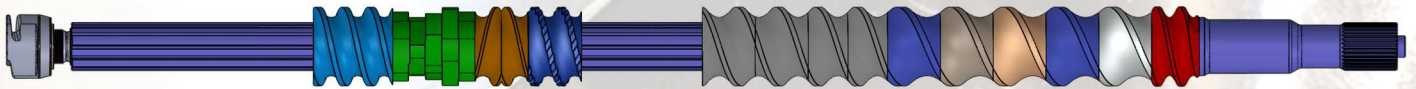
For all these applications, GTS experts have long-time experience regarding steel alloys and different types of wear protection such as PTA or Laser Welding on the running surface or bimetallic liners in barrel segments.

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## Large Co-rotating screws and barrel segments

GTS specialists have a broad knowledge regarding the design of co-rotating twin screws for the chemical industry. In this field we manufacture co-rotating twin screws with a diameter of 200mm up to 400mm, including the screw shafts.

These high-output machines are manufactured to the highest manufacturing standards. GTS engineers do calculations of energy consumption, output and other requirements around large co-rotating machines.



By customer request GTS can do optimizations to increase the production range, so that with the same screw design the full range of molecular weights can be produced.

Our experience in screw design characterizes every GTS engineer. We will find an answer for your required screw design. Our service engineers will support you in changing screw elements and with the start-up of the line after stopping process.



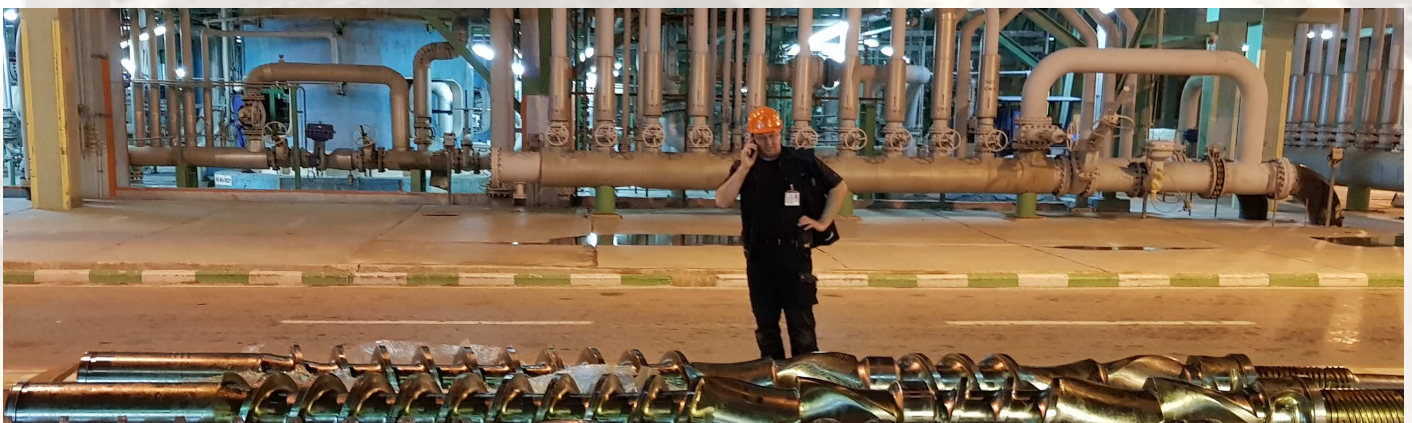
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## Why GTS?

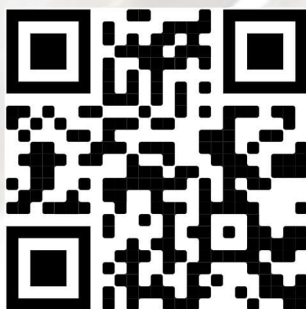
- Long-term reliability and wide processing window
- Globally well-approved products
- Highest Engineering and Manufacturing Quality
- Best-in-class Performance and Output
- Shortest start-up and longest running time
- Own GTS Lab for innovative R&D
- Product design with focus on simplicity
- Excellent price-performance ratio
- Quotes within 48 hours and 7/24 service worldwide
- Fast communication and shortest delivery times
- Flexible and customized solutions
- GTS is motor for innovation (15+ patents)
- Screw optimization for all polymers and applications
- Unique and well-approved GTS Design Software
- Simulation of extreme process conditions
- GTS database for most polymers
- Highest and innovative wear protection
- Start-up and installation support
- Training at the line for all processing steps
- Management training incl. global market situations
- Consulting in Plastic Processing
- GTS Model of PVC gelation
- Screw design based on Plastic Know-How
- Spare parts for all extruder brands
- High energy efficiency by innovative design

## Design Highlights

- GTS Continuous Change (almost no free-cuts)
- Change Over between different flight numbers
- GTS Integrated Tip Design (ITD)
- Different types of Feedings
- GTS closed-loop, self-optimizing and maintenance-free temperature control
- GTS Barrel Tempering (Air vs. Liquid)
- Intensive cooling near barrel ID
- Multiple Ventings (up to 6 vent ports)
- Vent port for high-steam exhaustion
- Vent port with side stream screw and with optimized viewing angle
- GTS Back venting
- Multiple feeding barrel design
- Bimetallic wear protection with TC
- All types of ID and OD Splines
- Flight integration of Powder Sealing
- GTS types of Mixing and Sheering Elements
- Spiral and axial grooved feedings (singles)
- Screw design for all types of polymers, for widest bulk density and highest filler rate (PVC-350 pph)
- Twin Screw design based on GTS gelation model
- Crammer Feeder from 0.1 to 1.1 kg/dm<sup>3</sup>
- Screw design for all types of filler and reinforcement material



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