

HENSCHEL



Powerful



Railway Gears | **Extrusion Gears** | Worm Gears | Special Gears | Melt Pumps | Couplings | Service

Reliable | Intelligent | Efficient



Quality pays off

Henschel develops the optimal solution wherever power is efficiently and safely transmitted. This applies to vehicles, plants and machinery, that require high reliability and availability. We provide perfect harmony within the entire system guaranteeing a safe operation with minimal maintenance and high efficiency.

Henschel was founded in 1810 in Kassel. With a high level expertise in the field of drive technology, Henschel has developed a worldwide reputation excelling in its high quality. In many countries today, locomotives and lorries with the Henschel star are in operation. This is symbolic of a knowhow that is very familiar in the entire power train industry today.

On this base we developed our Extruder gearboxes – the core elements of our range. We develop and deliver modern, state-of-the-art Extruder gearboxes for highest output and strongest torque rates.

Committed to this tradition we develop solutions.

With more than 50 Years of Experience, we look back on a long and successful Tradition of manufacturing Extruder Gearboxes

Highest power density, efficiency and reliability: these are the characteristics for our gearboxes.

We offer state-of-the-art extruder gearbox solutions, which meet the daily high demands of the end user according to output capacity and reliability. There is a rising demand for innovative and intelligent drive solutions. This is our mission.

Reliable

Henschel services and products have a reputation for over 200 years of being very reliable. We develop systems that have a high operational reliability and are able to cope with unpredictable requirements. Safety and stability in all processes and procedures are a major feature in cooperation with our customers.

Intelligent

Henschel with its German state-of-the-art engineering applies its best knowledge in its core markets. The validity of this knowledge is employed daily to expand and share. Based on this knowledge, we design new solutions, securing our competitive edge.

Efficient

In the operation, engineering, manufacturing and service, we are as efficient as our products. Highest efficiency, low maintenance frequencies and high safety provide excellent products.

Twin-Screw Extruder Gearboxes

We have been offering leading drive solutions for counter-rotating twin-shaft extruders for more than 40 years.

Counter-rotating

Examples of areas of application are:

Pipe Extrusion | Profile Extrusion | Granulation



The DURUMAX® series stands for innovative extrusion gear technology at the highest level and with the highest quality. Intensive research, development and testing, as well as optimal quality control are the guarantee for the high performance of the Extruder gear in a compact design. We offer trend setting Extruder gearbox concepts which meet the daily high demands of the end users, not only in terms of output.

For extrusion lines, the drive unit consists of an essential machine component representing the highest quality and fulfilling all requirements. Under these conditions, Henschel produces high-quality, high-performance single-screw and twin-screw extruder drives.

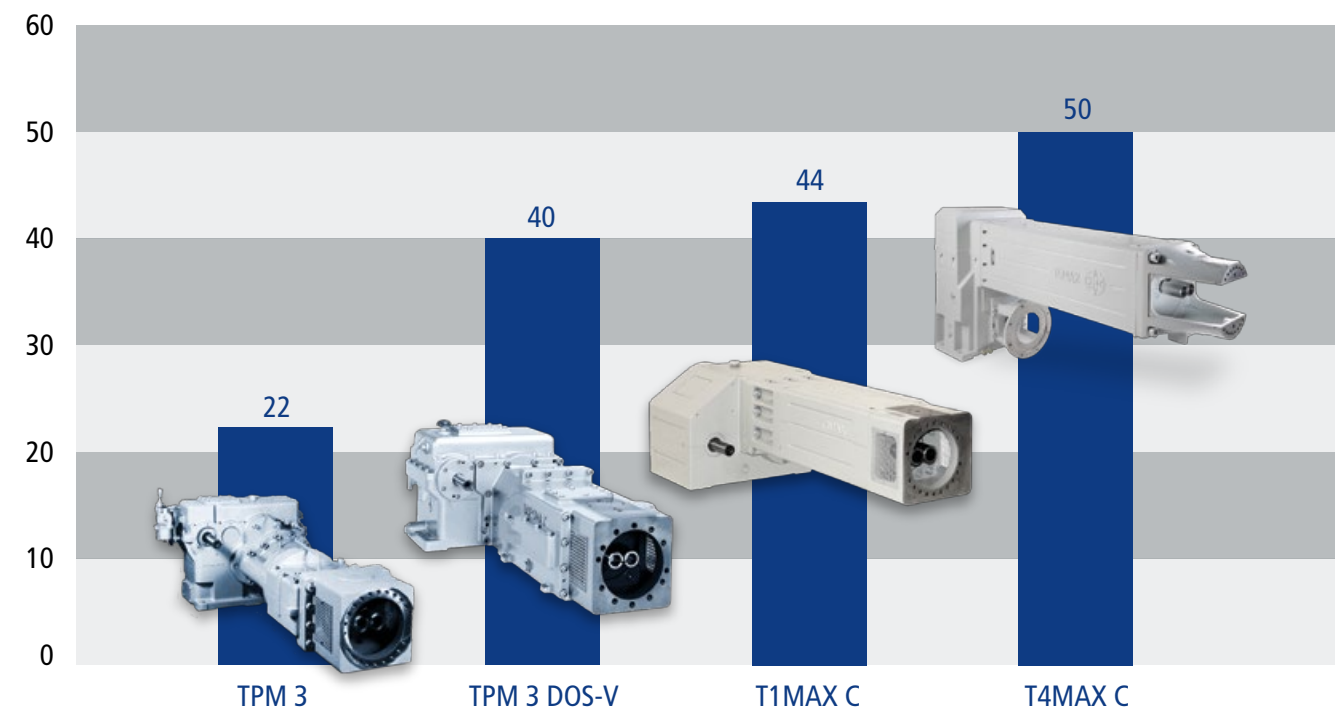
Our counter-rotating gearboxes can be driven directly by a motor or via belt at the input shaft. In the multi-stage helical gearbox the speed is reduced while the required torque is created. In the distribution gearbox this torque is splitted to the two counter-rotating output shafts. The axial forces coming from the extrusion process is absorbed by thrust bearings inside the thrust bearing housing.

Take advantage of the following benefits:

- Compact and modular design with high performance through the use of high-strength steel
- Optimal smoothness and quietness by ground helical gears and optimised tooth geometry
- High efficiency due to a minimum of rotating parts
- Reduced vibration in the construction of cast iron housing
- Superior high reliability and availability
- Excellent price-performance ratio

We have for each output range optimum alternative transmission and drive solutions.

Torque factor in Nm/cm³



DURUMAX® – TPM 3

The DURUMAX® TPM 3 gearbox was the first one designed with the 3-shaft distribution concept and has been in the market for over 40 years. This design concept has been improved over the years and presently has a wide range of applications.



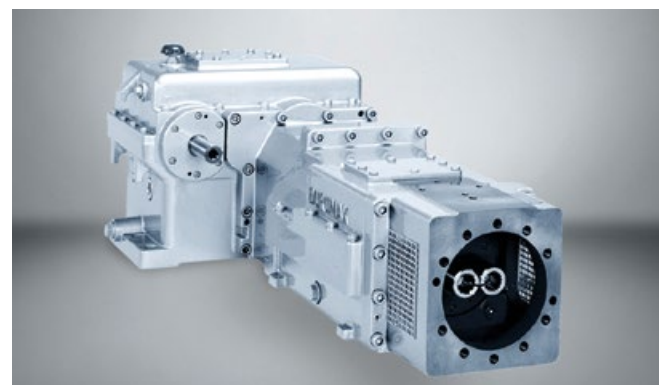
Size [Screw Ø]	Center Distance [mm]	Torque/shaft
90	75.35	4,216
107	90	8,000

DURUMAX® – TPM 3 DOS-V

The DURUMAX® TPM 3 DOS-V from Henschel Antriebstechnik offers the extruder builder high gearbox technology based on latest technical standards, which has been globally successful in hard competition to other products. We have forward-looking extruder gearbox concepts for you which convert the daily high requirements of the end user, concerning output into reality.

After the success story of the TPM 3, Henschel introduced the TPM 3 DOS-V series in the early nineties with up to 86 % higher torque ratings than the previous series.

Different from the TPM 3 series the distribution of the torque is done by two similar gear pairs (like a double helical gear).



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
65-77	55 - 61	3,200 - 4,700
90	75.35	7,500 - 7,860
107 - 114	88 - 92.5	12,400 - 13,350
130 - 140	110 - 114	20,300 - 23,160

DURUMAX® – T1MAX C

The extruder gearbox T1MAX C is the consistent development of the extruder gearbox series TPM 3 DOS-V with the proved 3-shaft distribution concept, which is world-wide the most popular concept in counter-rotating extrusion. With the T1MAX C we offer the most efficient concept with the highest performance in its category.

The DURUMAX® T1MAX C twin-shaft extruder offers the extruder builder high gearbox technology based on latest technical standards with up to 19 % higher torque ratings compared to the TPM 3 DOS series.



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
92	75.35	8,985
110	90	15,126
125 - 135	108 - 110	25,000 - 29,765
145	122	35,000
177 - 180	146 - 150	67,500

DURUMAX® – T4MAX C

Trend-setting: The DURUMAX® T4MAX C twin-shaft extruder gearbox for the highend-counter-rotating extrusion applications. With a torque factor of 50 Nm/cm³ the strongest counter-rotating twin-screw extruder gearbox in the market.

Highlighted Features:

- 20 % higher torque rating compared to the T1MAX C series
- Operation reliability higher-than-average

The technical concept of the T4MAX C series consists of a reduction gearbox and a distribution gearbox with integrated thrust bearings.

The split of the torque occurs within the distribution stage by pinion shafts lying on the top of the other. The connection of the motor effects direct by a flange and a coupling. The 4-stage reducer part builds-up the torque at the required screw speed. The torque is distributed equally to the two extruder shafts.

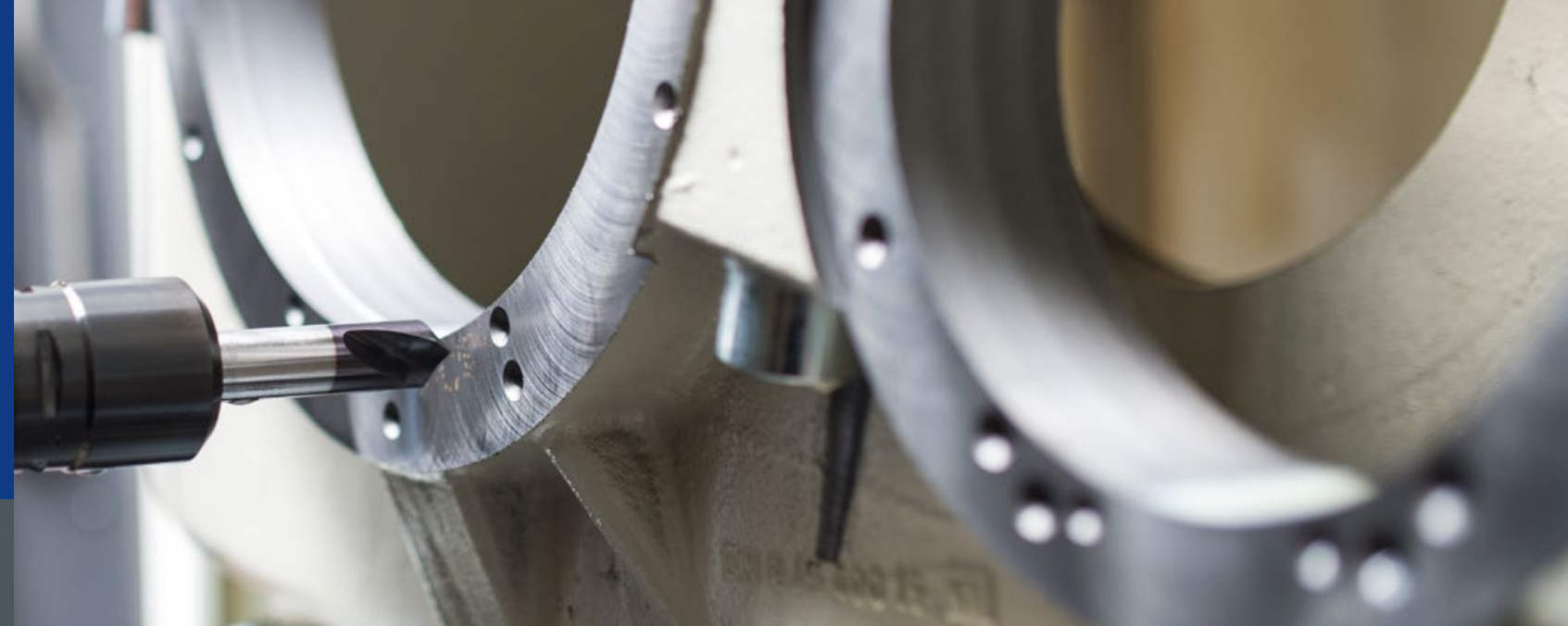


Size [Screw Ø]	Center Distance [mm]	Torque/shaft
78	65	6,930
93	77	11,500

The axial forces from the extrusion process are absorbed safely by the axial bearings within the distribution housing.

Twin-Screw Extruder Gearboxes

Also for co-rotating twin-shaft extruders we are offering leading drive solutions with torque ratings up to 40 Nm/cm³.



Co-rotating

Examples of areas of application are:

Compounding | Direct Extrusion | Food and Petfood Extrusion

The DURUMAX® series stands for innovative extrusion gear technology at the highest level and with the highest quality. Intensive research, development and testing, as well as optimal quality control are the guarantee for the high performance of the Extruder gear in a compact design. We offer trend setting Extruder gearbox concepts which meet the daily high demands of the end users, not only in terms of output.

For extrusion lines, the drive unit consists of an essential machine component representing the highest quality and fulfilling all requirements. Under these conditions, Henschel produces high-quality, high-performance single-screw and twin-screw extruder drives.

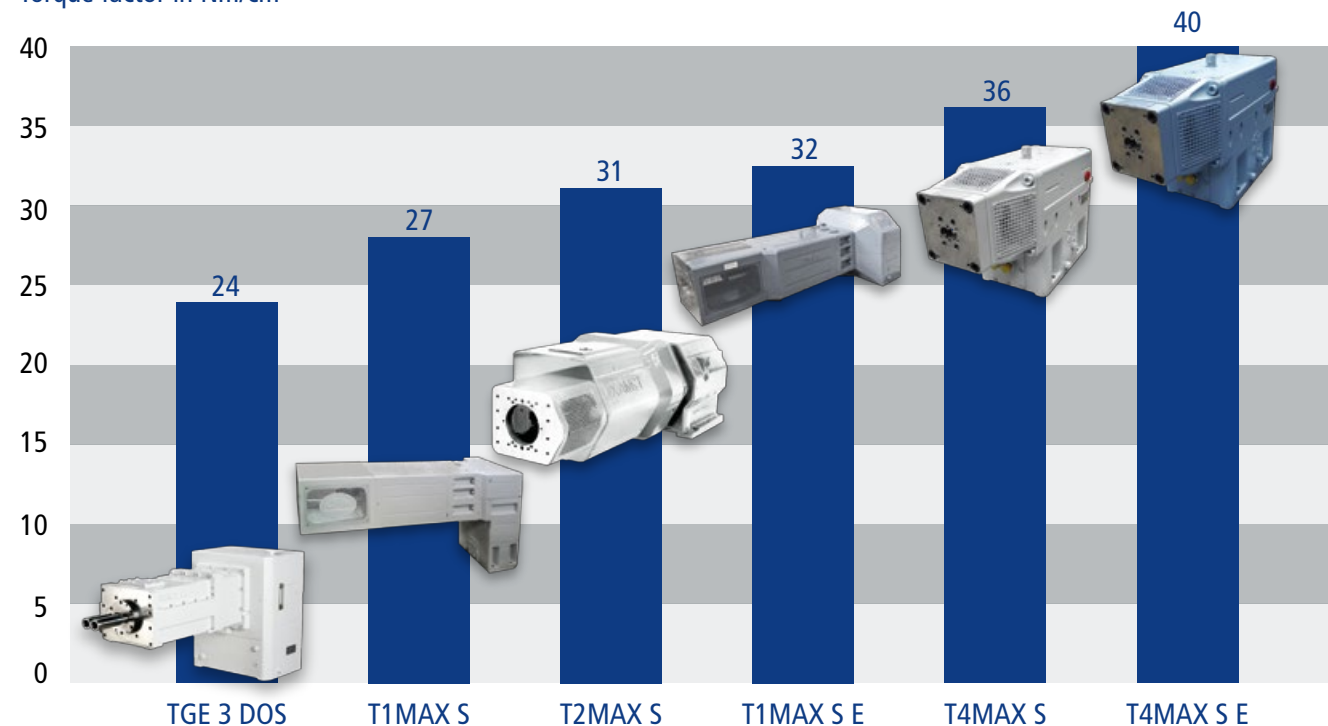
Our co-rotating gearboxes are driven directly by the motor, for the small gearbox sizes motor flanges are available as an option. In the single-stage helical gearbox the speed is reduced while the required torque is created. This torque transmitted in the distribution gearbox to the two co-rotating output shafts. The axial forces coming from the extrusion process is absorbed by thrust bearings inside the thrust bearing housing.

Take advantage of the following benefits:

- Compact and modular design with high performance through the use of high-strength steel
- Optimal smoothness and quietness by ground helical gears and optimised tooth geometry
- High efficiency due to a minimum of rotating parts
- Reduced vibration in the construction of cast iron housing
- Superior high reliability and availability
- Excellent price-performance ratio

We have for each output range optimum alternative transmission and drive solutions.

Torque factor in Nm/cm³



DURUMAX® – TGE 3 DOS

With a robust design and a torque factor of 24 Nm/cm³ the most popular co-rotating twin-screw extruder gearbox in the market.

Based on the approved TPM 3 DOS-V series of counter rotating twin-shaft extruder gearboxes, Henschel developed the DURUMAX® TGE 3 DOS series for co-rotating extrusion in 1997. The range has been continually extended in all sizes.

The technical concept of the TGE series consists of a reduction gearbox and a distribution gearbox. Both gearbox modules are connected by the thrust bearing housing.

Similar to the TPM 3 DOS-V series the distribution of the torque is done by two similar gear pairs (like a double helical gear) with optimized design.



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
34-37	30-310	340
40-43	48-53	715-900
51-52	63-65	1,224-1,650
70-77	58.5-64	1,910-2,400
90-95	76-78	4,920-5,400
133	110	15,800

DURUMAX® – T1MAX S / T1MAX S E

Based on the proven 3-shaft distribution concept the T1MAX S offers torque ratings of up to 32 Nm/cm³.

With the T1MAX S we offer the most efficient concept with the highest performance in its category. The DURUMAX® T1MAX S co-rotating twin-shaft extruder gearbox offers high torque ratings combined with high safeties.

Similar to the TPM 3 DOS-V series the distribution of the torque is done by two similar gear pairs (like a double helical gear), here with optimized design.



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
60-65	50-52	1,900-2,200
58.5-60	70-75	2,750
82	68	5,130
76-78	90-95	4,920-5,400

DURUMAX® – T2MAX S

Based on an 7-shaft distribution concept the T2MAX S offers torque ratings of up to 31 Nm/cm³ with a unique performance and reliability.

In the year 2000, Henschel introduced the DURUMAX® T2MAX S co-rotating twin-shaft extruder gearbox. Based on this new concept, it has offered unique, highest torque ratings combined with high safeties.

The technical concept of the T2MAX-Series consists of a reduction gear and a distribution gear. Both gearbox modules are connected by the thrust bearing housing. The distribution of the torque is done by two vertical placed gear pairs.

The gearbox is driven by a motor directly at the input shaft. In the one-stage helical gearbox the speed is reduced while the required torque is created. This torque is transmitted in the distribution gearbox to the two co-rotating output shafts. The axial



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
70	58.5	3,200
103	84	8,400
133	110	20,500

forces coming from the extrusion process is absorbed by thrust bearings inside the thrust bearing housing.

DURUMAX® – T4MAX S / T4MAX S E

Based on a 4-shaft distribution concept the T4MAX S offers trendsetting torque ratings of up to 40 Nm/cm³.

The DURUMAX® T4MAX S co-rotating twin-shaft extruder gearbox reaches high torque factors in combination with high safety factors for co-rotation extrusion.

Highlighted Features:

- Compact design: the reduction and a distribution gear is combined in one housing
- The distribution of the torque is done by two vertical placed gear pairs
- Superior high reliability



Size [Screw Ø]	Center Distance [mm]	Torque/shaft
26-27	22-23	120-190
33	26.9	350
43	35	650

Single-Screw Extruder Gearboxes

Developed especially for the requirements and interests of extrusion.

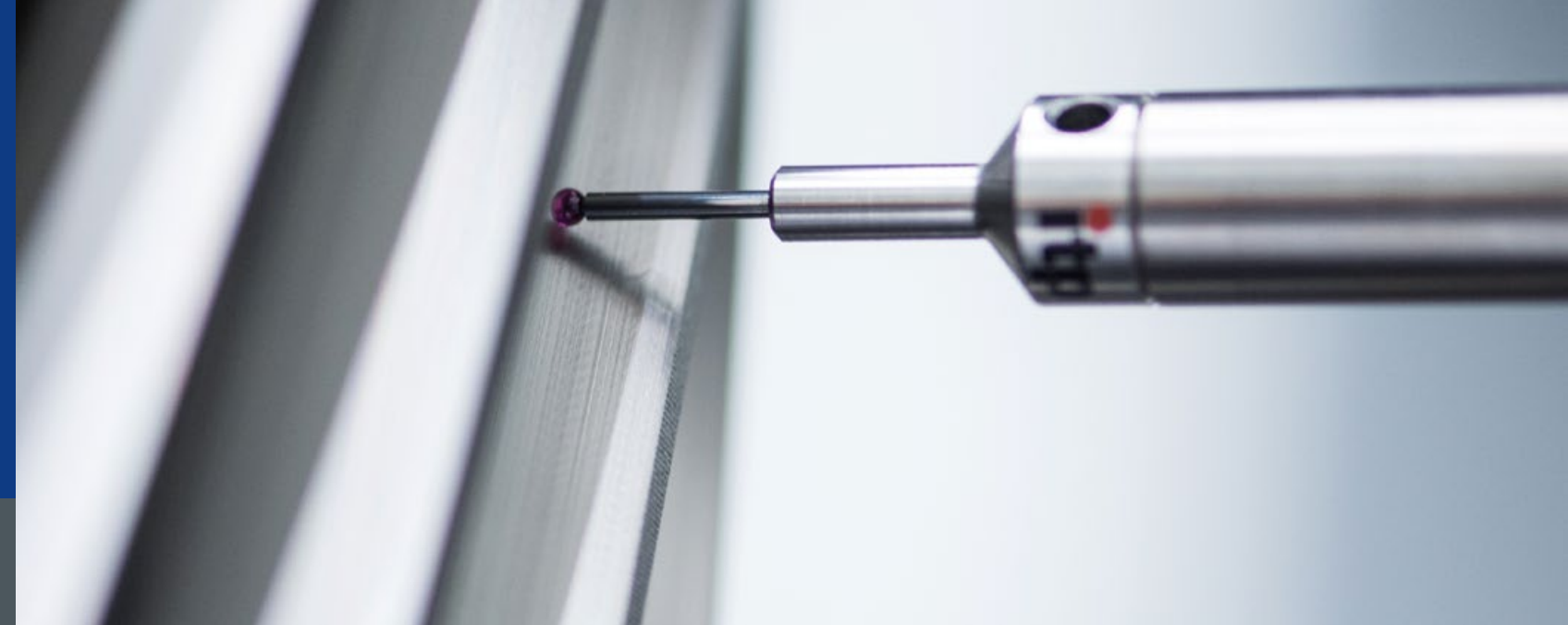
Examples of areas of application are:

Pipe Extrusion | Profile Extrusion | Film Extrusion | Pet Food

Single-shaft extruder gearboxes play an outstanding role in extrusion techniques, covering a wide range of individual customer requirements. The DURUMAX®-S1 and S2 have been developed especially to meet the requirements of extrusion.

An overview of your advantages:

- A standardised modular design allows flexible adjustments in regards to the customers needs.
- The operating expenses are maintained at a low level by economical power consumption and maintenance demands. Low friction bearings and low friction in tooth contact due to best manufacturing technologies ensures highest efficiency.
- The combination of the latest state-of-the-art technology, gears designed with optimised safety factors as well as field-experienced application factors for external impacts guarantee maximum longevity.



DURUMAX® – S

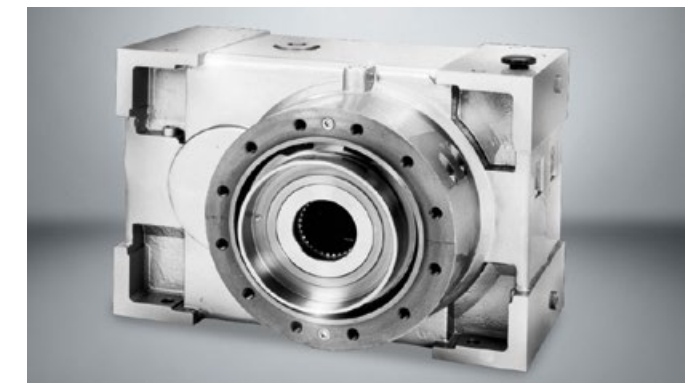
The DURUMAX®-S single-screw extruder gearbox is used in plastics processing, food and feed industry.

The technical concept for the drive provides the following characteristics:

- Modern gearbox design available with 1, 2 or 3 stages
- Direct or V-belt drive
- Ratios of $i = 6$ to 25
- Splash lubrication with integrated oil reservoir for emergency running properties
- Pressure-feed lubrication system for increased requirements
- Cooling of vertical and horizontal models by integrated cooling pipes for the most applications, external lubrication system on demand
- Cylinder and screw connections according to customer requirements

On request we supply following features:

- Removable screw from the backside through the gearbox
- Monitoring devices for backpressure, screw speed and oil temperature
- Motor flange for mounting the motor directly at the gearbox
- We can put your companies logo on the gearbox housing
- Gearbox supplied with final coating



Size [Screw Ø]	Center Distance [mm]
60	7,230
75	8,780
85	10,300
90	13,760
120	31,260
150	34,655



TA Oil Cooling and Lubrication Units

Tailor made oil cooling and lubrication units for every application.

Our tailor made oil cooling and lubrication units ensure optimum lubrication of our DURUMAX® gearboxes and a efficient heat elimination in every range of performance.



Single-screw extruder gearboxes are designed for splash lubrication. The quantity of oil ensures that all gears and bearings are lubricated. An oil level indicator shows the fill level. For the case that the nominal power exceeds the thermal limit power, an integrated water cooling coil could be installed. For special applications an external cooling and lubrication unit could be applied.

Twin-shaft extruder gearboxes are equipped with a combined splash- and pressure lubrication. An electrical or mechanical oil pump ensures that all gears and bearings are sufficiently lubricated. In the small and middle power range the gearbox housing is used as an oil reservoir.

The series TPM 2 DOS and TPM 3 are by default equipped with an oil pump and filter. For the other series the cooling unit is not included by default, but could be ordered optionally. Our tailor made oil cooling and lubrication units ensure optimum lubrication of our DURUMAX® gearboxes and a efficient heat elimination in every range of performance.

Features:

- For every application is an optimal dimensioned oil cooling and lubrication unit available
- Wide range of standard units consisting of
 - electrical driven oil-pump
 - heat-exchanger
 - pressure switch
 - oil-filter
- Each unit can be adjusted individually e.g. with:
 - switchable double oil filter with impurification display
 - thermometer, manometer
 - thermostat valve for cooling water flow



Service from Henschel – based on a passion for reliability and technological durability.

We are authorised to implement the highest availability of machinery and equipment in our industry.

The experienced and globally networked Henschel Service team inspects, replaces and repairs components and systems used in numerous industrial applications. We organise complete service chains, from cleaning to refurbishing. Each customer is given a personalised service package for effective minimisation of downtimes.

Henschel Service is a one-stop supplier. From individual items to components, we have what you're looking for, even components and systems from other manufacturers.

We define service as world-wide mobility and speed. We will repair your components and systems on site as required. That eliminates long transport and transfer processes. The workflow is transparent at all times.

We are also happy to repair and restore rare and individual one-off pieces, even if they are no longer complete. We owe that to our Henschel tradition. And you might be amazed at how much we can still learn from solutions of over a century ago, because we keep them in our archive, together with all of their constructional backgrounds.

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