

Worm gears Worm wheel sets

Unique level of effectiveness,
torque and lifespan

CAVEX[®]

German Drive Technology



www.CAVEX-Drivetechnology.com

7 Winning Arguments:

Technology - Made in Germany

CAVEX

1 Our superior CAVEX® gearing

Our worm gearboxes are quite unlike any other. We have been proving this with our patented CAVEX® gearing system in almost all industrial sectors across the world for more than 60 years. Our unique gearing geometry is far superior to standard worm gearboxes.

The name CAVEX® says it all, composed from the Latin word concavus, the profile on the worm, and convexus, the profile on the worm wheel. Thanks to worm teeth with a concave flank profile (concave worm) paired with convex worm wheels, CAVEX® worm gearboxes are far superior to comparable worm gearboxes of equal size. This combination of the teeth ensures better osculation of the flanks and thus leads to a lower flank pressure (Hertzian stress) and a better build-up of the lubrication film. The result: A higher torque transmission and an increase in service life by 30% due to lower wear and tear compared to other worm gearing systems.

2 The right size for (almost) any application

CAVEX® gearboxes - industrial gearboxes based on a modular design:

- Single-stage basic gear for 18 different construction sizes with a centre distance of $a=63\text{mm}$ to $a=630\text{mm}$, in certain applications even up to $a=900\text{mm}$
- Simple expansion of the basic gear with a helical pre-stage with transmissions from 2 to 5 or with a worm gear pre-stage with transmissions from 5 to 70 for a total transmission of up to approximately 5000. Adapting to the desired output torque is usually possible without a frequency converter

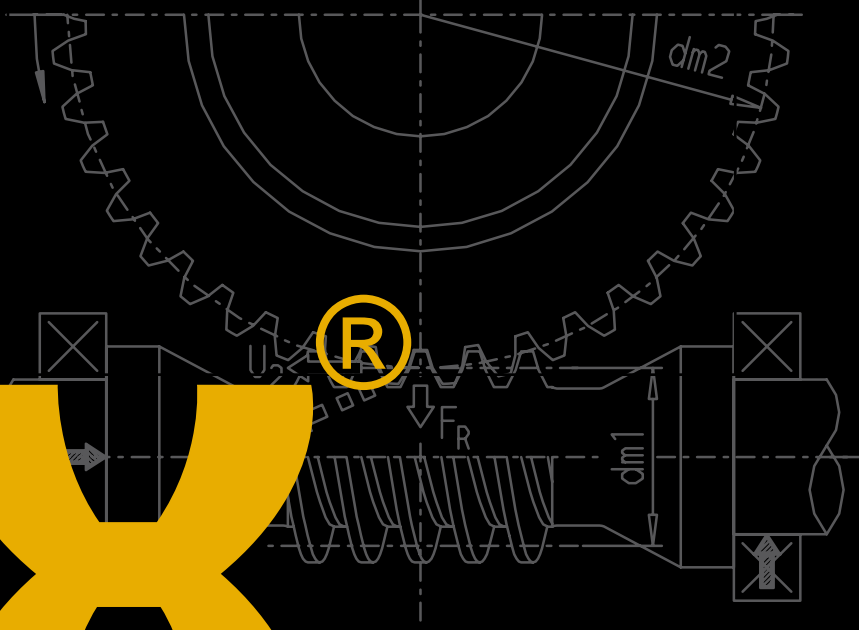
3 Highest range of transmissions

- Single-stage CAVEX® gear for standard transmissions from 5 to 70
- In addition, single-stage CAVEX® gearboxes with ratios over 100 are available on request
- Transmissions of up to 350 can be achieved with the addition of a helical or planetary pre-stage
- With two worm gear stages, a higher standard transmission of up to 5000, in certain customer applications of over 10,000, can be achieved

German Drive



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e Technology

4 Gear efficiency of up to 97%

Energy efficiency plays an increasingly important part when deciding which gearbox to buy. Our CAVEX[®]-worm gearbox boasts efficiency rates of up to 97%. It can easily compete with any type of gearbox (e.g. bevel helical gears or planetary gears etc.). This defeats the argument that worm gearboxes have a low efficiency rate.

5 CAVEX[®] gear design for ultimate reliability

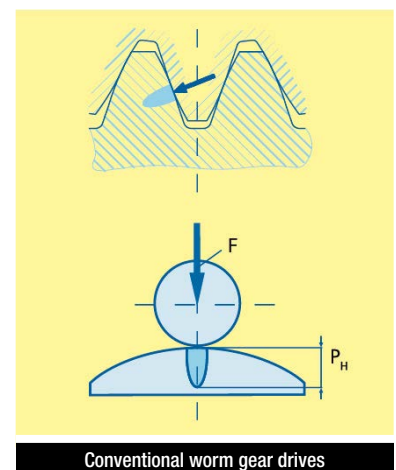
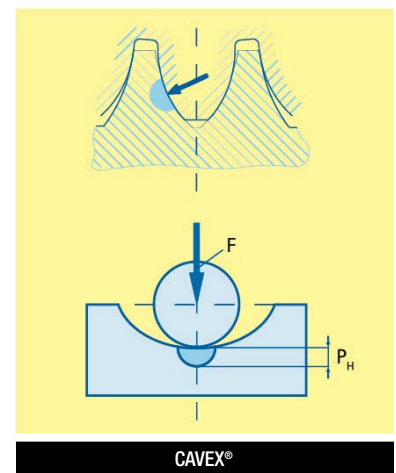
Over 65 years of experience in the development of worm gearboxes speak for themselves. It is not unusual to find gearboxes that still work reliably after more than 30 years' service. Quality-made German products as good as ever!

6 Noisy gearboxes? No way!

- Our gearboxes are exceptionally quiet because of the CAVEX[®] gearing system with its optimised lubrication film build-up
- This is enhanced by the use of anti-vibration casing material such as grey cast iron
- Due to the high transmission rates in the various stages, fewer parts are needed. This leads to a reduction in the gear mesh which also reduces noise

7 Individual & industry-specific solutions

- Optional adaption of our standard gearboxes to the customer's exact specifications
- Industry-specific adaptation of our standard gearboxes
- Developing tailor-made gearboxes for individual applications



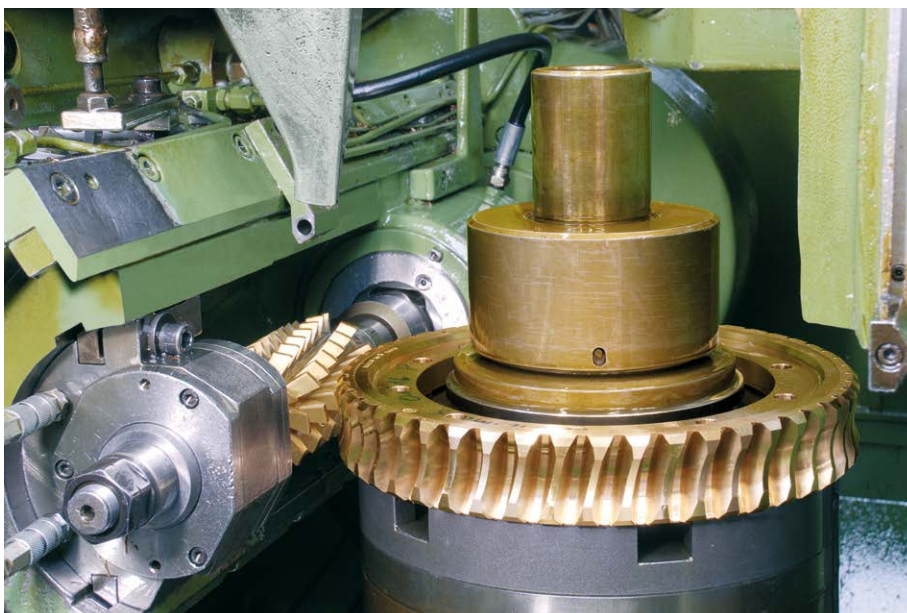
Worm gear production

Standard wheel sets or customer specific solutions

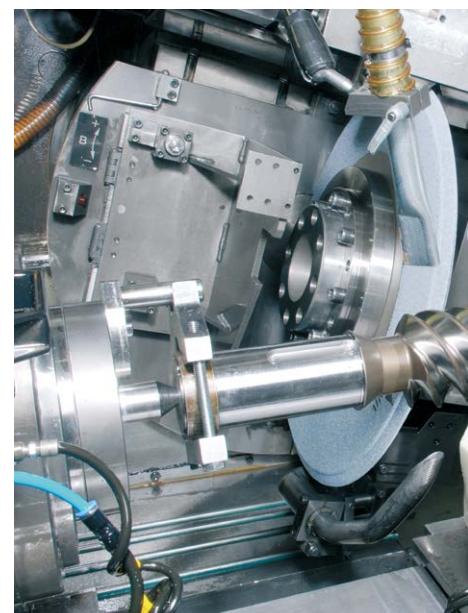
We produce worm wheel sets in versatile designs according to customer drawings. The CAVEX®- wheel set range has proven itself over decades. Due to their power density and the long lifetime CAVEX®- wheel sets are always number 1 among experienced constructors of sophisticated machines and units like

- Packaging machines
- Food machines
- Rolling mills (scissors, coilers, roller tables)
- Mixing units and agitators
- Ship construction

In case of tool machines with increased demands towards accuracy and rigidity the DUPLEX wheel set is usually the set of choice for many applications. In this wheel set the worm is designed with an adjustable incline, thus allowing an exact setting of the wheel set. This provides the ground for high precision production. The geometry profile of the CAVEX®-wheel set is decisive for the long standing time and the high load capacity of the wheel sets. Due to the hollow flank profile, the material characteristics of the high quality bronze of the wheel and the case hardened worm can be fully exploited because flank pressures are significantly reduced and the lubrication of the teething is clearly improved under



Worm gear milling machines



Worm gear grinders



all operating conditions. An especially large tooth root density is achieved on the worm due to the hollow flank profile. Thus, the wheel sets are especially resistant against impact strains during small revolutions.

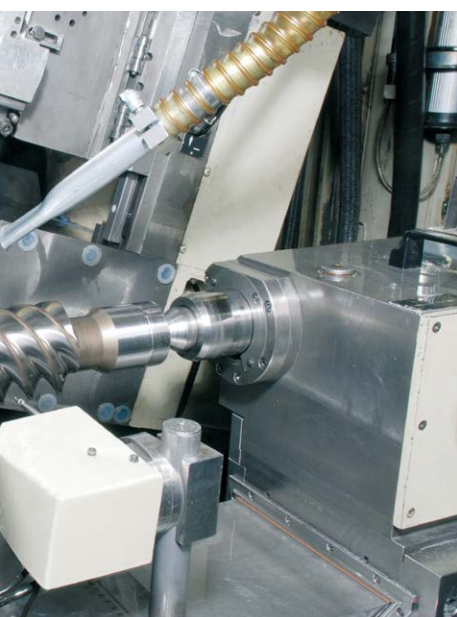
CAVEX®-wheel sets are designed for highest performances. We optimise the profile of the gear with state-of-the-art calculation tools. Because the reliability of the CAVEX®-wheel sets is high priority also under tough operating conditions. We examine this on every wheel set. After geometrical inspection of worm and wheel, the contact pattern is examined.

The production range of the CAVEX®-wheel sets includes:

- Centre distance 40 - 1.400 mm
- Transmissions 1 to 180
- Module 1 to 40
- Worm teeth count 1 to 12
- Increased accuracy
- Limited flank tolerance
- Finished sizes according to customer specifications
- Special versions

CAVEX®

German Drive Technology



Worm gear inspection

CAVEX[®] industry

Diversity is our drive

Industry solutions:

- Automotive
- Chemical und Pharmaceutical
- Energy
- Conveyor and Lifting
- Machine and Plant Engineering
- Paper and Printing Industry
- Packaging Technology

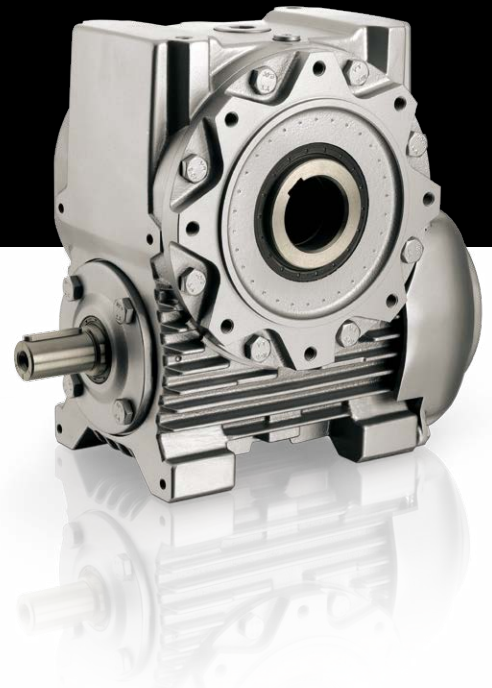
CAVEX[®] industry

Always the right solution

CAVEX[®]-worm gear units have been continually developed for more than 50 years. And one thing has been consistent over this time: your requirements. In addition to the standard CAVEX[®] range that is always up-to-date – in close cooperation with customers and partners –, a whole range of individual solutions has been created. Both for customer-specific applications as well as for individual sectors.

Full range

CAVEX[®] offers you the full range of CAVEX[®]-worm gear units in 18 sizes from 100 to 360.000 Nm. From single to multi level. In different standard variants, as branch specific solution or individually attuned to your needs.



CAVEX[®] - Worm gear units in detail:

| | |
|--------------------------------|---|
| Typical application examples | <ul style="list-style-type: none"> ■ Steel industry ■ Elevator drives ■ Solar technology ■ Mixers ■ Escalators ■ Paper industry |
| Versions of multi-level gears | <ul style="list-style-type: none"> Gear combination CAVEX[®] helical prestage module Gear combination CAVEX[®] as double worm gear unit |
| Torque | Up to 360.000 Nm |
| Number of gear sizes | Can be combined with prestages |
| Gear transmission single level | 5 - 140 |
| Gear transmission multi-level | 20 - 5.250 |

Typical versions:

- Solid and hollow shaft on the output
- Drive or output shaft on both sides
- Output with reinforced bearing
- Hollow shaft with keyway or shrink disc
- Labyrinth-shaft sealing
- Casing in grey cast iron (GG-20) or spheroidal graphite iron (GGG-40)
- Worm wheel sets with increased accuracy (e.g. DUPLEX-teething)

CAVEX[®] compact

Lightweight, efficient, flexible

Industry solutions:

- Automotive
- Chemical und Pharmaceutical
- Energy
- Conveyor and Lifting
- Machine and Plant Engineering
- Paper and Printing Industry
- Packaging Technology



CAVEX[®] compact

The perfect combination

These convincing arguments speak for themselves

For many decades, CAVEX[®] gearboxes have impressed with their advanced technology and their long service life. In our new CAVEX[®] compact series, we have further developed and optimised the CAVEX[®] technology and can now offer the following added value:

Lightweight- We managed to reduce the gearbox design to its absolute essentials, its weight is now up to 20% lower than comparable gearboxes on the market.

Efficient- With our original CAVEX[®] wheel sets, our new design achieves the highest efficiency rates in the market.

Flexible- Due to our sophisticated new gearbox design, we are compatible with many other brands.

- Compact design
- 20% lighter than comparable gearboxes
- Original CAVEX[®] gearing with its well known high efficiency

The following models are available:

| Size | | compact 80 | compact 120 | compact 160 | compact 200 | compact 250 | compact 315 | compact 355 |
|---------------------------|-------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Center distance | mm | 80 | 120 | 160 | 200 | 250 | 315 | 355 |
| Nominal output torque | Nm | 680 | 1.900 | 3.300 | 5.000 | 8.000 | 13.000 | 17.000 |
| Nominal input speed n_1 | min ⁻¹ | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 |
| Efficiency of gearset | % | ≤ 97 | ≤ 97 | ≤ 97 | ≤ 97 | ≤ 97 | ≤ 97 | ≤ 97 |
| Ratio | n_1 / n_2 | 5-140 | 5-140 | 5-140 | 5-140 | 5-140 | 5-140 | 5-140 |

We have achieved a new standard in price and performance.

You can take our word for it!

CAVEX[®]hygienic

Hygienic Design Gearbox

Industry solutions:

- Medical Engineering
- Chemical und Pharmaceutical
- Food industry

CAVEX[®]hygienic

A new stainless steel gear range by CAVEX[®]

Deliberately sophisticated

A worm gear is not just a worm gear. CAVEX[®] has proven this again and again for more than 50 years.

CAVEX[®] HD unit implements all the requirements of a “hygienic design” and combines them with the **CAVEX[®] product properties** that provide a **high load capacity**, the possibility of **high ratios in space saving surroundings** and **low noise emission**. Worldwide CAVEX[®] now offers the first worm gearbox which has been exclusively developed **for the above mentioned industries**.

An optimal cleaning is ensured through the use of stainless steel and a gearbox casing design that is characterized by ‘rounded’ outer surfaces. Through its compact design, the integration of the gearbox in applications provides flexibility and space saving.

The applications are multiple: on one hand, CAVEX[®]HD replaces conventional gears that, up to now had to be sealed off from critical zones behind complex stainless steel covers, and on the other hand, surface coated gears will be replaceable, which in the past has always been a compromise. The CAVEX[®]HD gearbox range is available as integrated gear motor (picture) and as gearbox with adaptable flange for different motors. Besides the standard models in the tabloid, customized variations are possible. Furthermore, customers benefit from a worldwide availability and the comprehensive service network of CAVEX[®].

- **Developed for the food industry and chemical/ pharmaceutical applications**
- **Full stainless steel casing**
- **CAVEX[®] original gearing system**

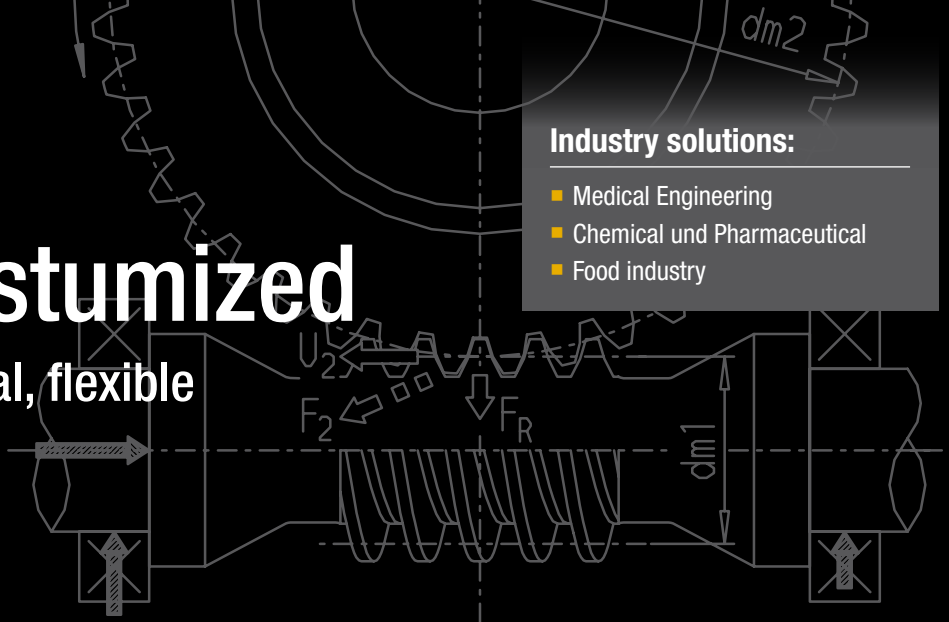
| Gearbox/ Gear motor | Center Distance mm | Ratio n_1/n_2 | Nominal Power Rating kW | Total Length mm |
|------------------------|--------------------------|--------------------|----------------------------------|-----------------------|
| CHD63 | 63 | 5-70 | - | - |
| CHD63M1200 | 63 | 5-70 | 1,2 | 550 |
| CHD63M850 | 63 | 5-70 | 0,85 | 500 |
| CHD63M400 | 63 | 5-70 | 0,4 | 460 |
| CHD40 | 40 | 5-70 | - | - |
| CHD40M330 | 40 | 5-70 | 0,33 | 340 |
| CHD40M250 | 40 | 5-70 | 0,25 | 340 |
| CHD40M180 | 40 | 5-70 | 0,18 | 320 |

CAVEX® customized

Optimized, individual, flexible

Industry solutions:

- Medical Engineering
- Chemical und Pharmaceutical
- Food industry



CAVEX® customized

Individual and industry-specific solutions

Our product range with its variety of solutions for various industries covers most applications ideally. In addition we offer customer-specific special solutions, either by adapting existing gearboxes or by developing completely new models. Our experience and our state-of-the art R&D department enable us to complete every project in a very short cycle time.

Do get in touch with us!

- Cooperative realization
- Cost efficient development
- Original CAVEX® gearing with its well known high efficiency

Checklist individual gearbox:

| Requirements | | Example | Unit |
|--|---------------------------|---------|------|
| Application | Food, pharmaceutical, ... | | |
| Type of Gearbox | Worm, coaxial, helical | | |
| Nominal power (installed electrical power) | | [W] | |
| Nominal output torque | | [Nm] | |

We gladly accept your challenge!

CAVEX® replica

Replicas of older FLENDER
worm gearbox ranges

Industry solutions:

- Automotive
- Construction
- Energy
- Machine and Plant Engineering
- Steel and Roller Mills

CAVEX® replica

Avoids redesign of existing machine configurations

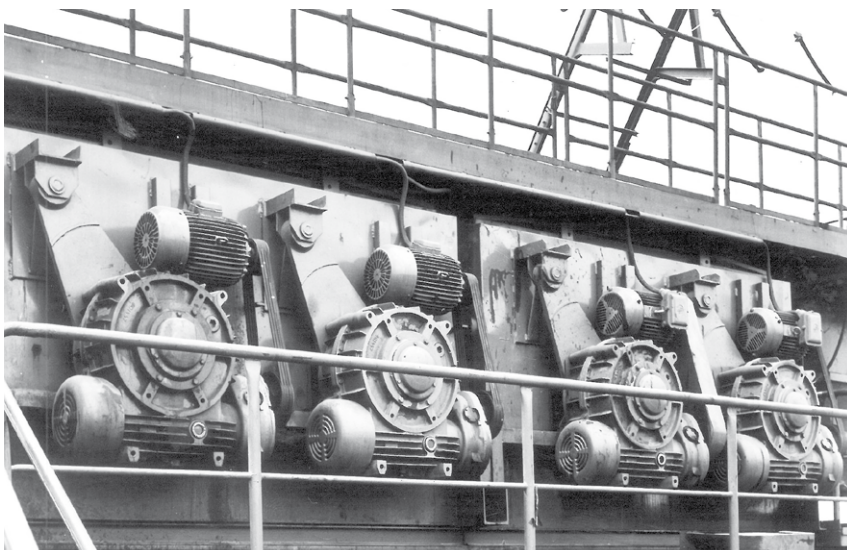
CAVEX® worm gearboxes are renowned for their robustness and their durability. In some settings a service life of 30 to 40 years is not exceptional.

We can offer you replicas of the old CAVEX® series produced by FLENDER or Siemens. This will save you engineering/design time for your current installation.

We look forward to hearing from you!



- **No change of machine design**
- **time efficient realization**
- **Original CAVEX® gearing with its well known high efficiency**



**We realize every replica
with the old serial number!**

CAVEX®-Service

Gearbox overhaul service with original parts and warranty

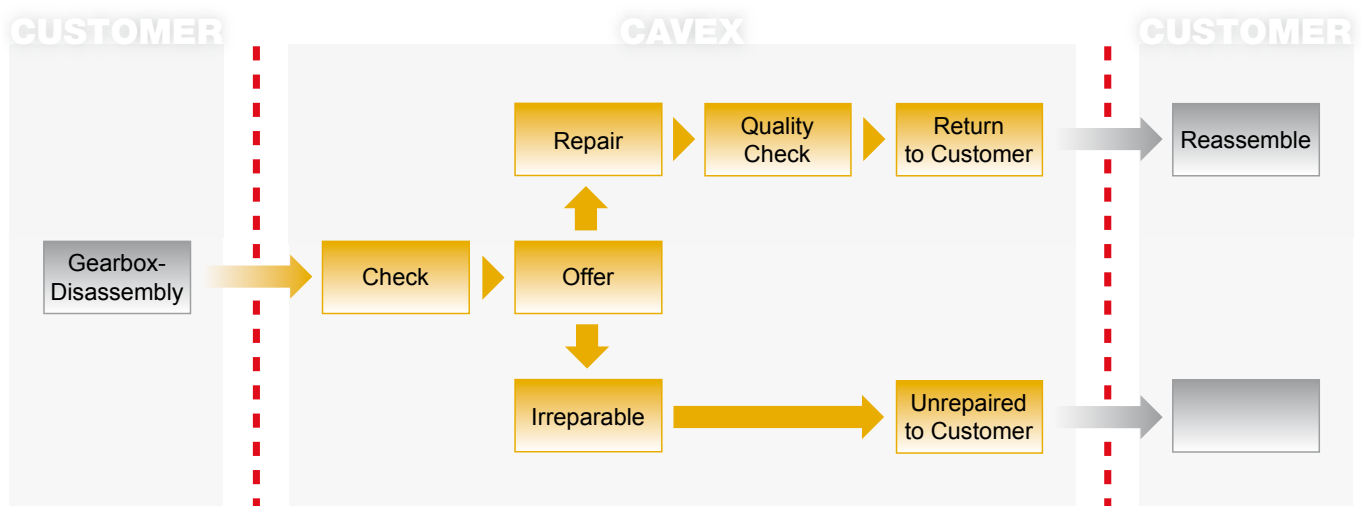


CAVEX® service

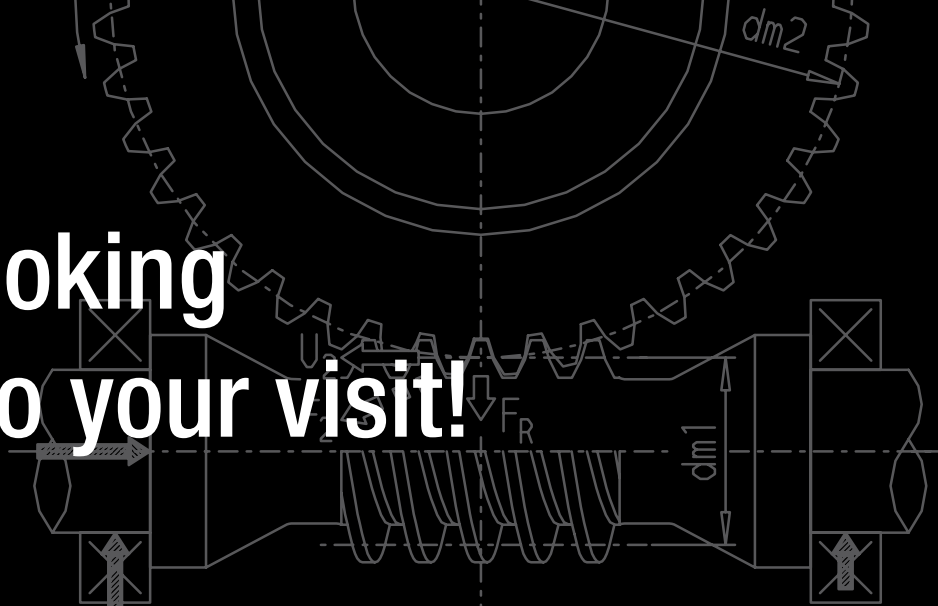
Guaranteed reliability

CAVEX® gearboxes perform reliably and almost maintenance-free for many years. If malfunction does occur, we are usually able to overhaul the gearbox. This saves you time and money. You can send us your gearbox stating the fault/defect. We will check it and give you a price for the repair. You then decide what to do. If you decide to go ahead, the repair work will be carried out in-house by our team of experts. After a quality check, your gearbox will be returned to you ready for reassembly. If a repair is not feasible, we will be pleased to offer you a replacement gearbox from our extensive product range.

Service process chart:

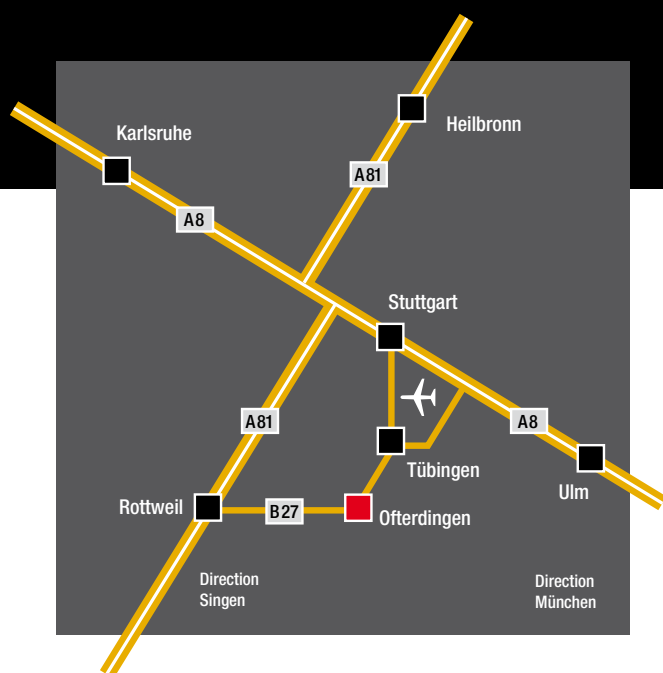


We are looking forward to your visit!



CAVEX®

German Drive Technology



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