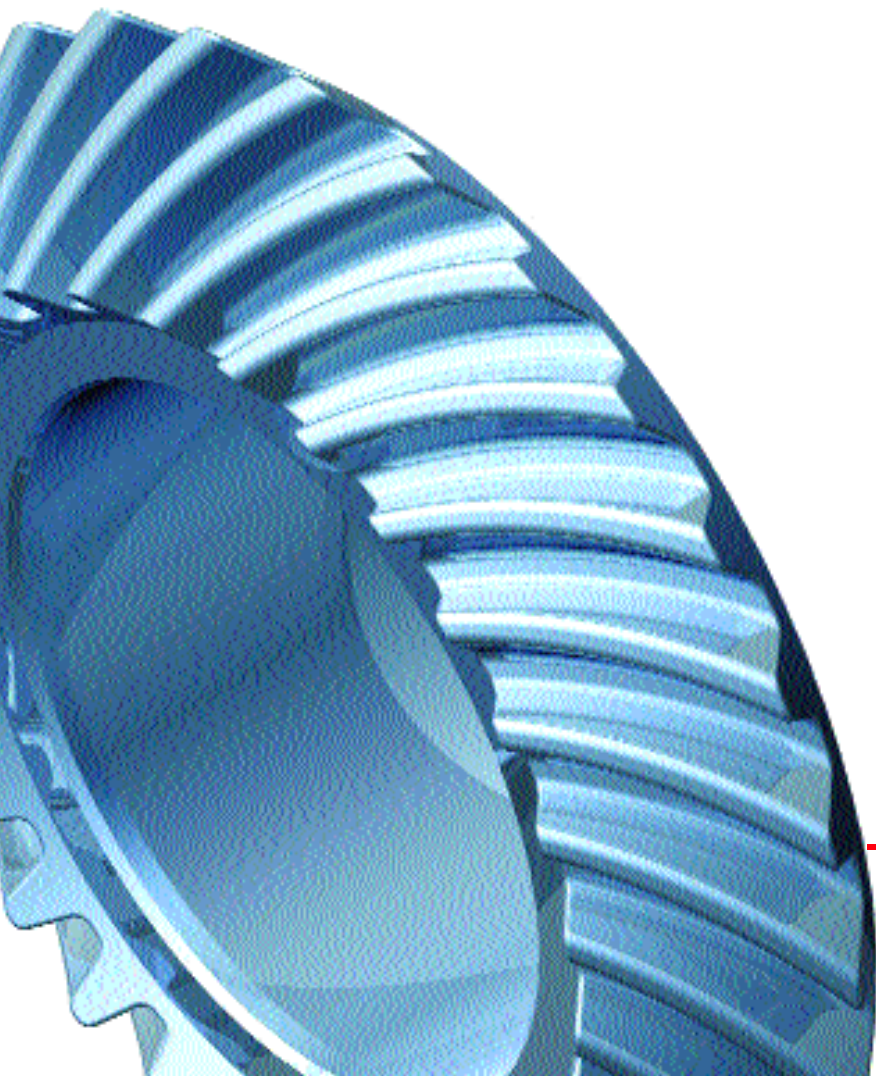
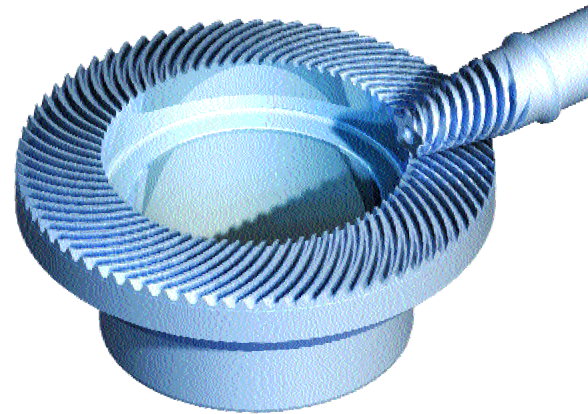




BEVEL  EAR

Experience and performance



GRAESSNER



Precision Technology Group

Precision Technology Group Limited

World wide actuation competence

<http://www.precisiontechnologygroup.co.uk>



Precision Actuation Systems Limited

Linear and rotary actuation competence

<http://www.pasgo.com>



Antriebstechnik · Automation

NEFF Antriebstechnik Automation GmbH

Innovation in Linear Technology

<http://www.neffaa.de>



Graessner GmbH Antriebstechnik

The Gear Company

<http://www.graessner.de>



Precision Technology USA, Inc.

Actuation competence for North America

<http://www.precisiontechnologyusa.com>

Welcome at Graessner

Thank you for your interest in our products. Our current staff of more than 100 qualified and highly motivated **employees** would be pleased to serve you.

More than 40 years of **experience**, in many industries and applications, is the basis we rely on.

High quality products are our reputation. **Quality**, for us, means the fulfilment of our customer's expectations in order to guarantee a long term business relationship.

Creative ideas from our dynamic team lead to continuous innovation and being open to new ideas, takes us forward.

Our **customers** have problems to be solved and providing our customer with complete support means we have fulfilled our task.

Challenge us – we both want **success**.



DIN EN ISO 9001

Where to find what



Application Samples

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Advantages of Spiral, Hypoid and Zerol® Bevel Gears

Page 6



Our production capability

Page 7



Our Performance

Page 8



Delivery of standard gear sets

Page 9



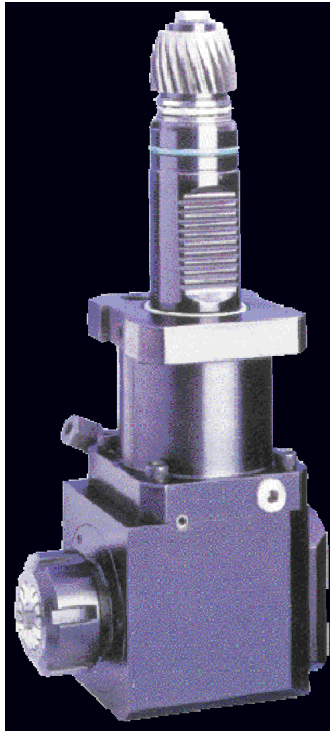
An Offer

Page 10

BEVEL GEAR

BEVEL GEAR *Application Samples*

Graessner bevel gears are used in a great variety of technical products. Performance and reliability is the basis for our success. The following samples show a small selection of products and branches we are represented.



Life Tools



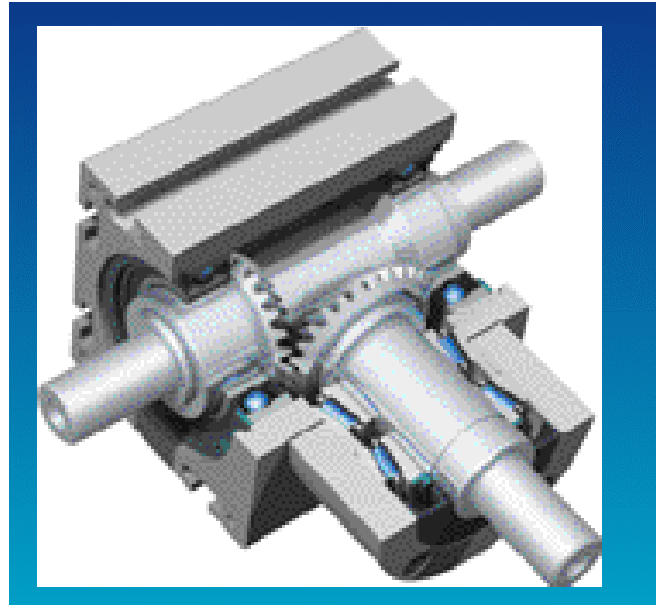
Life Tools



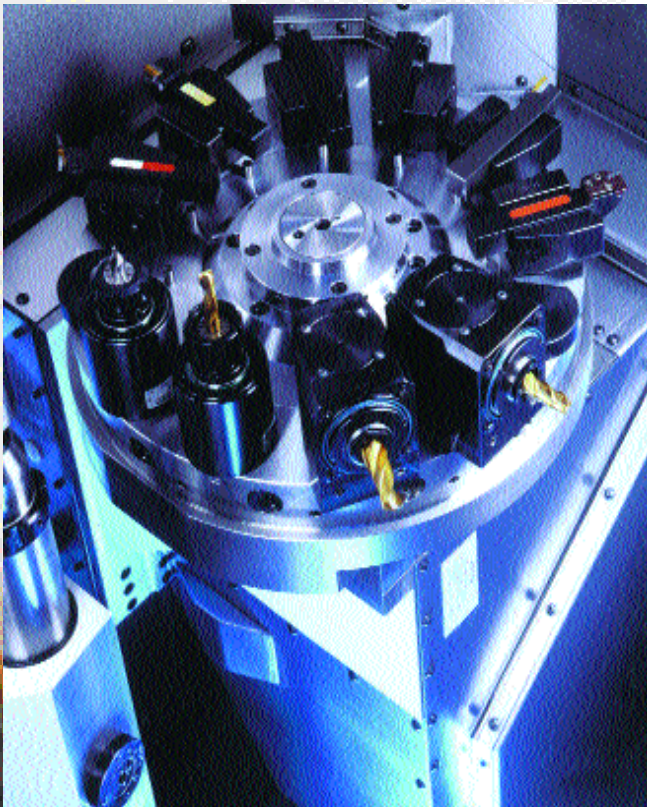
Industrial Tools



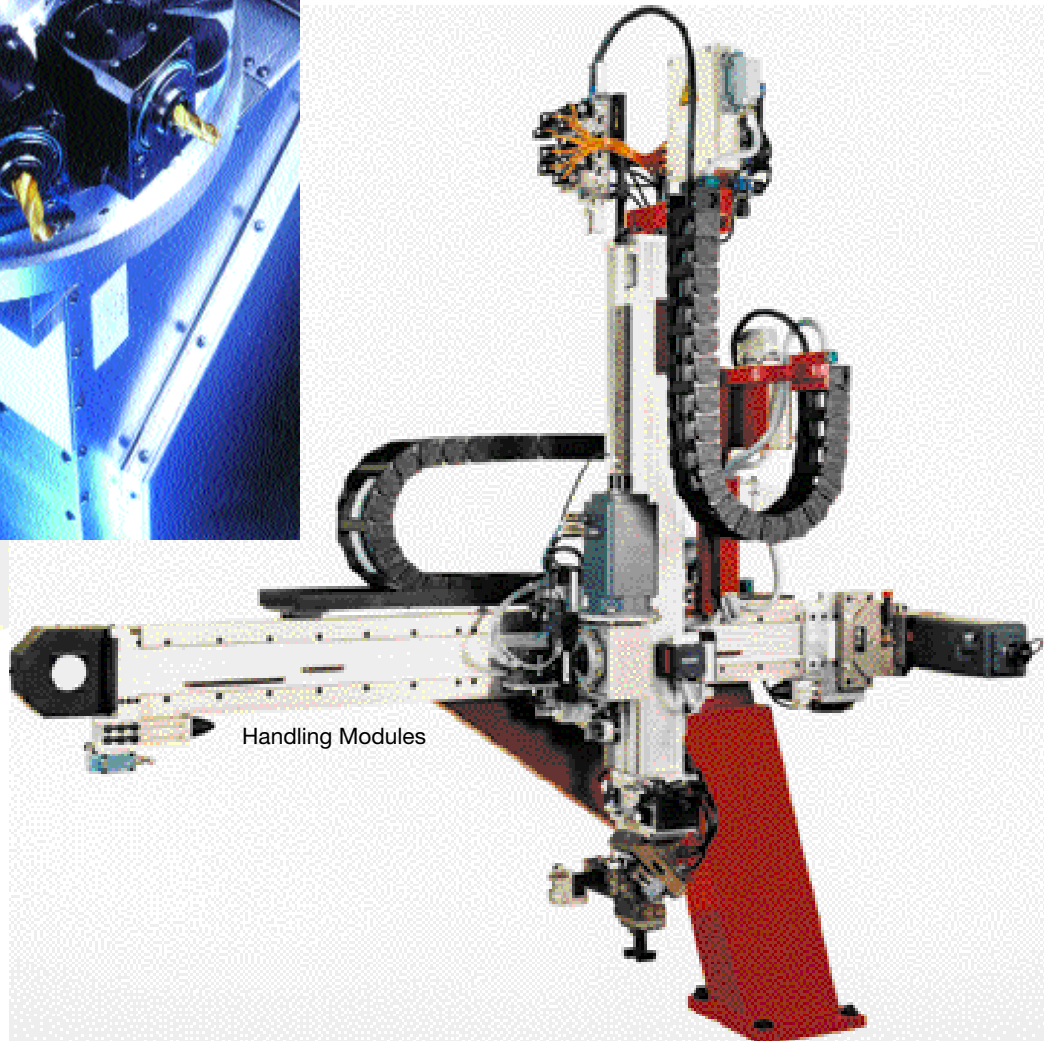
Robotics



Gear boxes



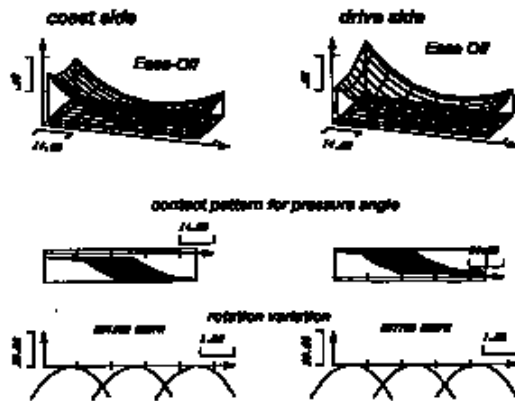
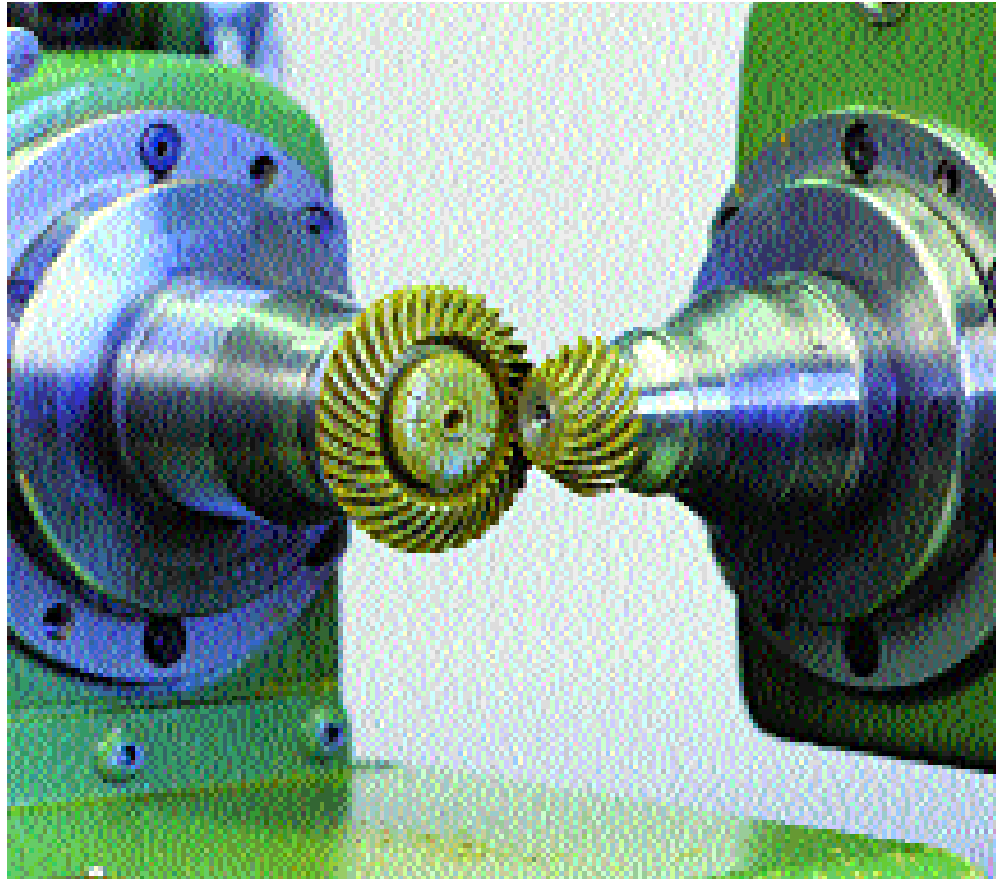
Machine Tools



Handling Modules

Advantages of Spiral, Hypoid and Zerol® Bevel Gears

- n High contact ratio with multiple teeth in contact
- n Insensitive against elastic deformation of gears, shafts and bearings
- n Circular arc gear teeth are more resistant against bending than straight or helical bevel gears
- n Localised tooth bearing avoids stress concentration at the teeth
- n Soft transmission of motion even at high speed and high load
- n Noise and vibration damping at high peripheral speed
- n Gear sets rotation in both directions
- n Efficiency > 97% depending on design and lubrication
- n Upon request all gear sets lapped and matched



Parameter optimised gearing development for highest torque and low backlash



.... allows a contact pattern optimised assembling for uniform load.



Spiral Bevel Gears
With circular arc gear teeth



Hypoid Bevel Gears
Similar to Spiral Bevel Gears but with an offset of the axis up or down



Zerol® Bevel Gears
Zerol Bevel Gears have a 0° mean spiral angle and is a combination between spiral bevel and straight teeth bevel gears



The figure shows a clear diameter increase of the Hypoid versus the spiral pinion. This results in a torque increase, a noise reduction and a longer life time.

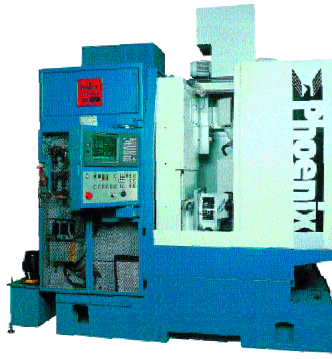
Our production capability

	Modul ms min.	max.	Outer gear dia- meter (A)	Face width max.	Outer cone distance.	Shaft angle max. from	to (B)
Spiral Bevel Gears	0,5	12,0	410 mm	66	280	10°	170°
Hypoid Bevel Gears	0,5	12,0	410 mm	66	280	–	–
Zerol Beel Gears	0,5	12,0	410 mm	66	280	10°	170°

(A) Depending on ratio (B) Depending on outer cone distance



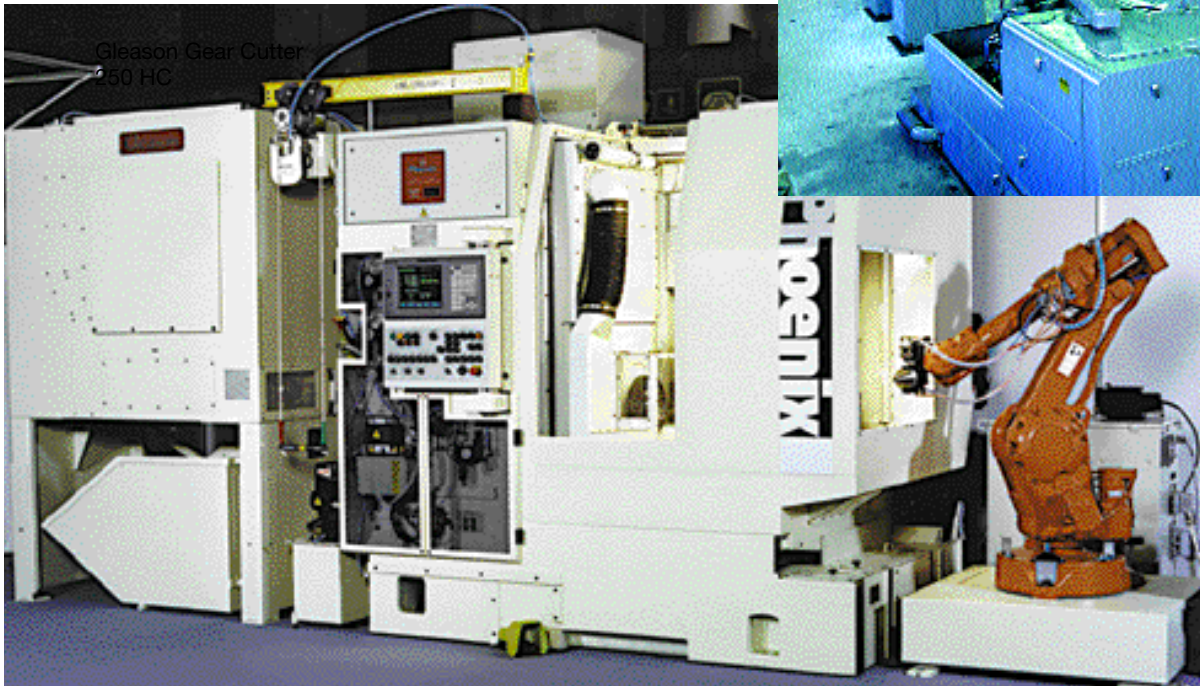
Gleason Gear Cutter 175 HC



Internal/External Grinder



Various Gleason gear cutter type 102 up to 631



Gleason Gear Cutter 250 HC

Design and development



Draft design

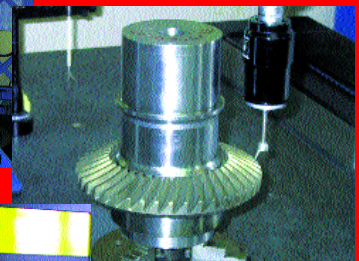
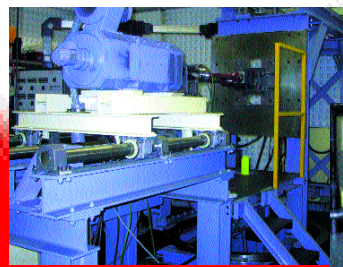
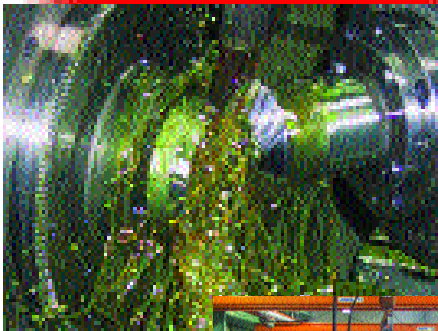


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3	20.10.00	3. Entwurf	J. Müller	K. Schmidt
4	25.10.00	4. Entwurf	J. Müller	K. Schmidt
5	30.10.00	5. Entwurf	J. Müller	K. Schmidt
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30	05.03.01	30. Entwurf	J. Müller	K. Schmidt

Production planning

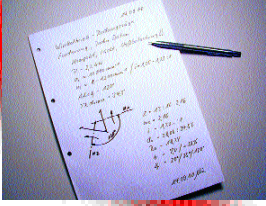


Production in various steps with intermediate inspection



Acceptance and final inspection

Our Performance



Consulting and contract agreement

Graessner combines in an extraordinary way the knowledge of a gear cutting specialist with the expertise of a gear box manufacturer. Contact us and profit by our long term experience. Our service does not stop with the delivery of components.

Graessner Inside means for us, we want to bring in our experience in the customers interest.

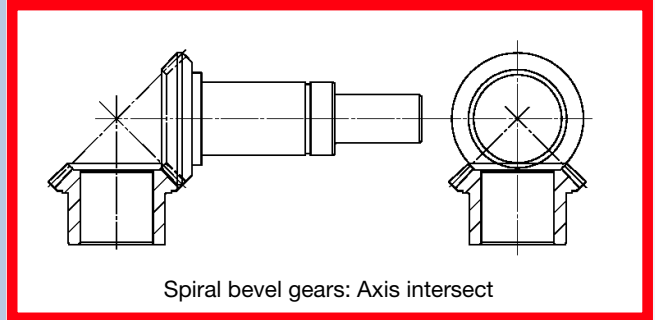


**GRAESSNER
INSIDE!**

Delivery of standard gear sets

Out of the own gear box programm, Graessner delivers standard gear sets

with short lead times. Partly we deliver off the shelf.

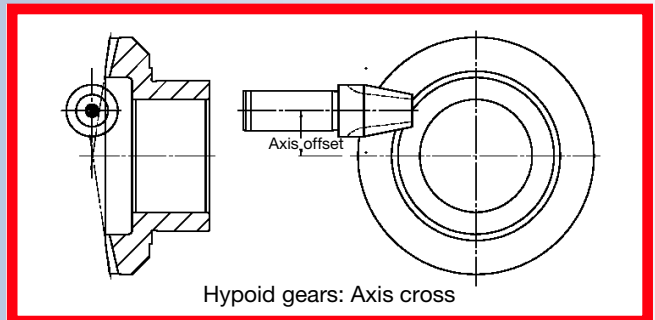


Spiral bevel gears: Axis intersect



Spiral bevel gear sets with ratio from $i = 1:1$ up to $5:1$

Torque from 10 to 7000 Nm
Speed up to 4000 rpm
Gleason spiral bevel gearing without axis offset



Hypoid gears: Axis cross



Hypoid bevel gears with ratio from $i = 3:1$ up to $15:1$

Torque from 25 to 1400 Nm
Speed up to 8000 rpm
Gleason spiral bevel gearing with axis offset

Please ask for our detailed documentation



BEVEL GEAR

An offer

We hope that we have convinced you that our products are right for you.

Please send us your requirements. We would be happy to discuss these with you and provide you with a firm quotation for your consideration.



GRAESSNER GmbH
Kuchenäcker 11
D-72135 Dettenhausen

Tel.: 0049/7157/123-0
Fax: 0049/7157/123-212
or -216

e-mail: mail@graessner.de
Internet: <http://www.graessner.de>

- Please call me
- Please visit me
- Please send me an offer

Torque _____

Ratio _____

Speed _____

Notes _____

Quantity _____

Delivery date _____

You can get me:

Name

Company

Department

Street

Town

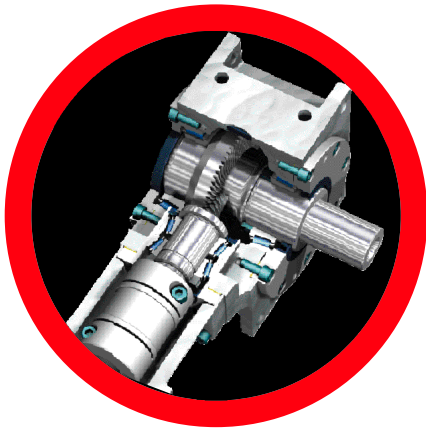
Tel.

Fax

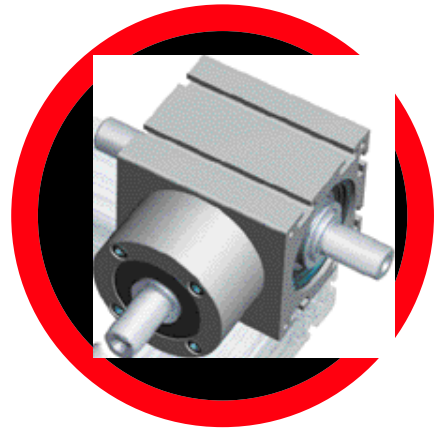
e-mail



GRAESSNER
THE GEAR COMPANY



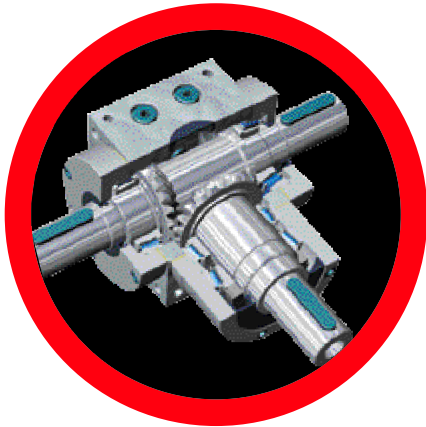
DYNA GEAR
Dynamic and precision



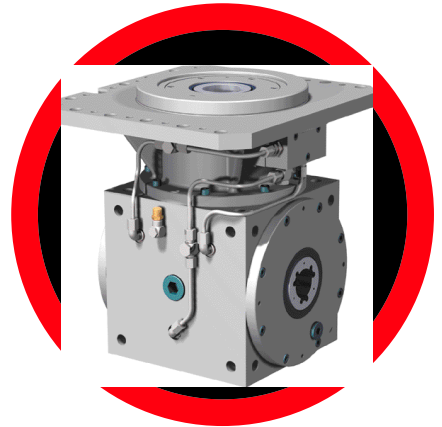
VALUE GEAR
Function and reliability



BEVEL GEAR
Experience and performance



POWER GEAR
Torque and stability



DESIGN GEAR
Variety and creativity

DYNA GEAR

The high dynamic right angle gear box

- q High input speed at medium to high torque
- q Ratios $i = 3:1$ up to $15:1$ **in single stage**
- q Torque up to 1440 Nm
- q Variable motor connection via flange and coupling
- q Low backlash 2 arc min
- q Variable ratios within one gear box size

POWER GEAR

The high torque distribution gear box

- q Highest torque figures within a small frame size
- q For average input speed
- q Ratios from $1:1$ up to $5:1$
- q Torque up to 7000 Nm
- q Output via solid and hollow shaft
- q Motor connection direct or via coupling and lantern

BEVEL GEAR

Spiral, Hypoid and Zerol Bevel Gears with ratios up to $i = 20:1$

- q Standard range and customised gears
- q Module m_s from 0.5 to 12
- q Max. outer diameter 410 mm
- q Axis angle 10° to 170°
- q More than 40 years experience
- q State of the art production and inspection machines
- q In house calculation for the gearing
- q We manufacture according to your drawing or support you in your design

VALUE GEAR

The low cost right angle gear box

- q Average torque at average input speed
- q Ratios $i = 1:1$ and $2:1$
- q Torque up to 80 Nm
- q Output via solid and hollow shaft
- q Variable mounting options due to the Aluminium profile housing

DESIGN GEAR

The customised special gear box

- q Two stage bevel helical gear boxes with ratios up to $i = 50:1$
- q Single stage gear boxes in switch and reverse mode execution
- q Forced lubricated gear boxes for high speed and torque
- q Labyrinth type sealed gear boxes with efficiency $> 99\%$
- q Special gear boxes with additional elements as functional units

GRAESSNER
Sales organisation
– worldwide

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e-mail: markus.evers@eie.fi
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GRAESSNER