

Eurotrans Gear Training 2011

A complete Gear Training Programme on Master Level (English spoken)

Although the Power Transmission Engineering industry is an important industry branch, universities fail to develop appropriate courses. In Europe, a mechanical engineer gets on average 5 hours of gear training. This is far too less to be effective in industry. Moreover, gear trainers are becoming rare due to retirement and non replacement. Therefore, Eurotrans identified the remaining top gear trainers and developed an extensive modular Gear Training covering all aspects from geometry and design over production to quality control and failure analysis. Addressing a European audience, this residential training is organised in several locations in close connection with famous gear laboratory.

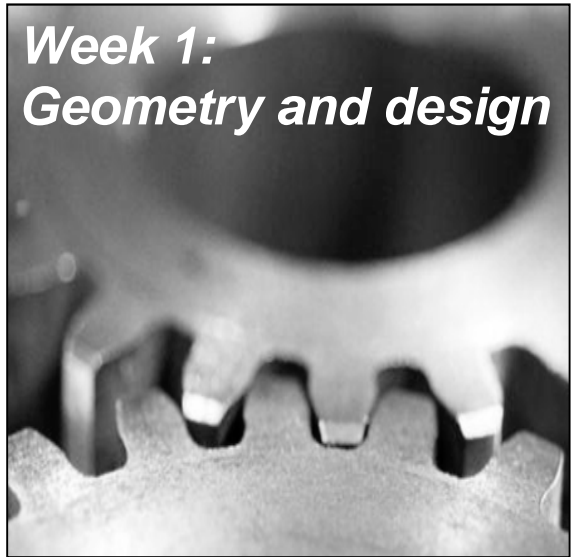
Week 1: Geometry and design

Week 2: Production

Week 3: Quality and failure

Week 4: Advanced design, will be announced later

Please find the detailed programme for each week below. If you wish to subscribe, please use the subscription form at the end of this folder. Room reservations should be made directly with the hotel using the separate reservation form to take advantage of the special Eurotrans rates.



Week 1: Geometry and design

When? 6 – 10 June 2011

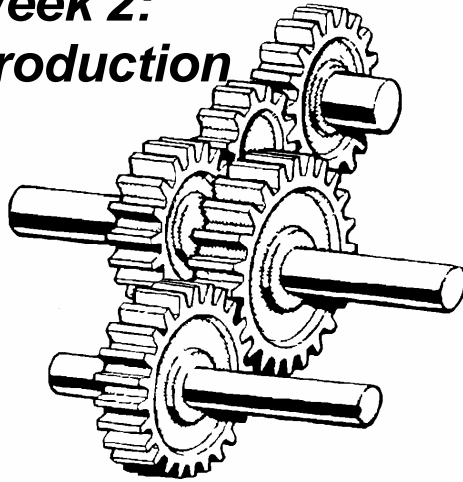
Where? Munchen, Germany (in collaboration with FVA)

Accommodation? Rooms are available at **Hotel Hoyacker Hof**. Please confirm your room reservation directly to the hotel preferably one month before the start of the course. Hotel information is included at the end of this folder. Accommodation is not included in the price.

Social programme? The training package **includes evening dinners and social activities** such as a guided walk through the city centre of Munchen and a visit of the Laboratories of the Institute for Gears at the University of Munich (FZG). The social programme can be subject to change.

Monday AM Travel				
Monday PM	INTRODUCTION	Introduction to Gears	Why gears, short history, applications, types. General kinematics and dynamics, basic gear law, survey of Standards (ISO etc).	Dr. Wirth
Monday PM	GEAR GEOMETRY	Geometry of involute gearing	Spur and helical gears, basic definitions of single gear, gear pairs, mesh	Dr. Wirth
Tuesday AM	GEAR GEOMETRY	Gear corrections	Profile and lead corrections, load distribution, vibration excitation	Dr. Wikidal
Tuesday PM	GEAR GEOMETRY	Variant gear Systems	“Special gears”: bevel gears, conical gears, worm gears, general kinematics, basic definitions Planetary gears: kinematics, powerflow, efficiency	Dr. Wirth
Wednesday AM	MATERIAL AND HEAT TREATMENT	Gear materials	Selection of gear materials, heat treatment, SN-curve, damage line, strength values	Dr. Michaelis
Wednesday PM	GEAR RATING	Basic rating practice	Introduction fo gear rating, relevant stress parameters, rating of bending, pitting, scuffing, slow speed wear, micropitting and flank breakage	Dr. Michaelis
Thursday AM	GEAR RATING	Standard gear rating	Standardized gear methods in ISO, bending, pitting, scuffing, micropitting – examples	Dr. Wikidal
Thursday PM	TEST METHODS	Oil tests	Influence of lubricants on gear load capacity, test methods and test results, introduction of test results in gear rating practice	Dr. Michaelis
Friday AM	GEAR RATING	Program codes	Application of standard gear rating methods, examples	Dr. Wikidal
Friday PM Travel				

Week 2: Production



When? 12 -16 September 2011

Where? Leuven, Belgium

Accommodation? Rooms are available at the **Lodge Hotel** in Leuven. Please confirm your room reservation directly to the hotel preferably one month before the start of the course. Hotel information is included at the end of this folder. Accommodation is not included in the price!

Social programme? The training package **includes evening dinners and social activities** such as a guided walk through the old city centre of Leuven and a visit to a brewery. The social programme can be subject to change.

Monday AM Travel				
Monday PM	SURFACE TREATMENT	Surface hardening techniques	Gear (surface) hardening: methods, metallurgy, micro-structure, equipment, process, control: case hardening, nitriding, induction	Guy Claus (Sirris)
Tuesday AM - PM	SURFACE TREATMENT	Case hardening (detail)	In depth study of case hardening process: ovens, oil, harding profile (definition and measurement, standards), defects (overcarburising, oxydation...), process control, monitoring, optimal charge...	Guy Claus (Sirris)
Wednesday AM	INTRODUCTION		Gear Basics	Dr. Türich (Gleason)
Wednesday AM	GEAR HOBBING		Gear Hobbing of small pitch applications – Technologies, Machines, Tools	Dr. Kobialka (Gleason)
Wednesday PM	GEAR SHAPING		Gear Shaping Chamfering & Deburring of gears Gear Shaving – Technologies, Machines, Tools	Dr. Kobialka Mr. Schäferling (Gleason)
Thursday AM	GEAR HONING		Important Aspects of Premachining for Honing and Grinding Gear Honing Solution for modern Threaded Wheel Grinding Technology	Dr. Türich Mr. Schäferling (Gleason)
Thursday PM	GEAR FINISHING		Decision Criteria for hard finishing processes Gear inspection Combined processes	Mr. Schäferling Mr. Deiniger (Gleason)
Friday AM	GEAR FINISHING		Gear Hobbing of Large Module Gears Productivity Increase in Grinding of Large Module Gears	Dr. Kobialka Dr. Türich (Gleason)
Friday AM	GEAR PRODUCTION		Other production technologies and discussion Wrap-up and closing remarks	TBD (Gleason)
Friday PM Travel				



Week 3: Quality and failure

When? 10 – 14 October 2011

Where? Newcastle, United Kingdom (Design Unit)

*Accommodation? Rooms are available at the **New Northumbria Hotel** in Newcastle. Please confirm your room reservation directly to the hotel preferably one month before the start of the course. Hotel information is included at the end of this folder. Accommodation is **not** included in the price!*

*Social programme? The training package **includes evening dinners and social activities** such as a guided walk through the old city centre of Newcastle, a river cruise and a club night at 'Pitcher and Piano'. The social programme can be subject to change.*



Monday AM Travel				
Monday PM	MEASUREMENT	Gear quality	Gear tolerances: definitions, standards, evaluation with reference to the total gear quality.	Rob Frazer (DU)
Tuesday AM	MEASUREMENT	Gear quality	Gear tolerances: definitions, standards, evaluation with reference to the total gear quality.	Rob Frazer (DU)
Tuesday PM	MEASUREMENT	Measurement practice	Measurement methods, process, reporting, evaluation, interpretation, management of equipment, calibration...	Rob Frazer (DU)
Wednesday AM	MEASUREMENT	Interpretation of measurement graphics	Analyses of deviations of profiles, helix, pitch. Link with their origins	Rob Frazer (DU)
Wednesday PM	TRIBOLOGY	Tribology of gear mesh,	Oil film, friction coefficients, roughness, material, oil qualities and qualification, heat generation, efficiency...	Michel Octrue (CETIM)
Thursday AM	TRIBOLOGY	Lubrication systems in gear transmissions and coatings	Thermal rating and power losses - micropitting, scuffing for different applications in a range of speeds, sizes, shaft arrangements and environments...	Michel Octrue (CETIM)
Thursday PM	MAINTENANCE	Maintenance practice of gears	Good practice in maintenance of gear transmissions.	Michel Octrue (CETIM)
Friday AM	MAINTENANCE	Monitoring gear transmissions – Failure analysis	Monitoring gear performance in the field. Analysis of typical gear failures (incl. standards).	Michel Octrue (CETIM)
Friday PM Travel				



EUROTRANS GEAR TRAINING (CHECK THE WEEKS OF YOUR CHOICE)

- WEEK 1 “GEOMETRY AND DESIGN”**
Munchen (GE), 6 – 10 June 2011
- WEEK 2 “PRODUCTION”**
Leuven (BE), 12-16 September 2011
- WEEK 3 “QUALITY AND OPERATION”**
Newcastle (UK), 10 – 14 October 2011

INSCRIPTION FORM

> Form to be returned at least **7 days before the start of the course** (or **30 days for early bookings**) to **Marleen Poelmans**, Diamant Building, bd A.Reyers In 80, 1030 Brussels, by fax 02/706 79 88 or by e-mail to marleen.poelmans@agoria.be

Mr./Mrs.

Function

Company

Address

E-mail

Tel. Fax.

VAT Nr

Participation fee for an **individual** week of training:

- 1900 EUR (vat excl.) per person for early bookings at least **30 days before** the start of the training
- 2000 EUR (vat excl.) per person for late bookings at least **7 days before** the start of the training
- 2500 EUR (vat excl.) per person for organisations non-member of EUROTRANS associations**

From the 2nd and consequent inscription from the same company a 100€ reduction will automatically be granted.

An invoice will be sent to you upon receipt of your registration from **FVA** for week 1, from **Agoria** for week 2 and from **Design Unit** for week 3. Invoice address if different from the above:

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Cancellation conditions:

- > No charge if cancelled at least 30 days before the start of the course
- > For cancellations at least 7 days before the start of the course, 50% of the inscription fee will be refunded
- > No refund will be made for cancellations received after 7 days before the start of the course, however replacement of a registered person is possible
- > **In case of insufficient inscriptions the course will be cancelled and refunded**

Date and signature:



EUROTRANS GEAR TRAINING

- ❑ **WEEK 1 “GEOMETRY AND DESIGN”**
Munche n (GE), 6 – 10 June 2011
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Leuven (BE), 12-16 September 2011
- ❑ **WEEK 3 “QUALITY AND OPERATION”**
Newcastle (UK), 10 – 14 October 2011

HOTEL INFORMATION

Please confirm your room reservation **directly** to the hotel preferably one month before the start of the course. To make use of the Eurotrans negotiated rate, please mention the block booking code upon reservation. Accommodation is **not** included in the price!

We recommend the following hotels:

- ❑ **WEEK 1 “GEOMETRY AND DESIGN”**
Munche n (GE), 6 – 10 June 2011

Hotel Hoyacker Hof

Freisinger Landstr. 9A - D - 85748 Garching bei MÜNCHEN
Tel. 00 49 89 3269900 / Fax. 00 49 89 3207243

Mail info@hoyackerhof.de

www.hoyackerhof.de

Block booking code: **meeting Eurotrans**

Price indication single room: € 80 breakfast included
Booking before 13/5/2011

- ❑ **WEEK 2 “PRODUCTION”**
Leuven (BE), 12-19 September 2011

The Lodge Hotel

Kantineplein 3 - B – 3001 Heverlee (Leuven)
Tel 00 32 16 509 509 / Fax 0032 16 509 508

Mail heverlee@lodge-hotels.be

www.lodge-hotels.be/lodge/enghotelheverlee.html

Block booking code: **Agoria – meeting Eurotrans**

Price indication single room: € 100 breakfast included
Price indication suite: € 115 breakfast included
Booking before 1/8/2011

- ❑ **WEEK 3 “QUALITY AND OPERATION”**
Newcastle (UK), 10 – 14 October 2011

The New Northumbria Hotel

61-73 Osborne Road, Jesmond / UK – NEWCASTLE UPON TYNE NE2 2AN

Tel 00 44 191 281 4961 / Fax 00 44 191 281 8588

Mail info@thenewnorthumbriahotel.co.uk

www.newnorthumbriahotel.co.uk

Block booking code: **Eurotrans/Newcastle University**

Price indication single room: £ 75 breakfast included