



REACTION PROCESS MACHINERY

Training courses 2011

IN PARTNERSHIP WITH INDUSTRY

KraussMaffei is a premium partner for the plastics and rubber processing industries worldwide



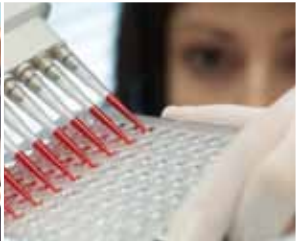
Automotive



White Goods



Construction



Life Sciences



Electrical/Electronics

Whatever you aim to achieve in plastics or rubber processing, KraussMaffei is your partner. We are the only company with intensive expertise across the three main engineering fields. And we have a strong track record in integrating this expertise to develop new processes and systems.

Ready for any challenge

Our **Injection Molding Machinery Division** supplies machinery and systems from 35 to 4,000 tonnes for standard applications and for all processing variants, together with fully automated solutions. We have a strong customer base in all the relevant industries worldwide.

Our **Reaction Process Machinery Division** supplies machines and complete systems for processing polyurethanes and other reactive materials.

Completing our product portfolio, **Automotive Component Systems** supplies foam molds, cutters and routers. Our customer base is wide, with a focus on the automotive, construction and white appliances industries.

Our **Extrusion Technology Division** supplies machinery and systems for compounding, for pipe, profile and sheet extrusion, physical foaming, and the production of technical rubbers and intermediates for tire production. Machinery from the company's range – from single extruders to

complete extrusion lines – is used in many industries, including chemicals, pharmaceuticals, automotive, construction, furniture and packaging.

People for Plastics

We are the “people for plastics”. We are your partners from the first exploratory discussion, through development to commissioning, servicing and operating your system, and final disposal. At all times, you are assured of outstanding competence in planning and engineering, as well as reliable and fast spare parts, service and support.

Adding value for customers

We put our expertise to work for your success. With machine ranges engineered for modularity, we can deliver application-specific solutions based on our wide range of standard modules and specially engineered solutions. This strategy offers customers technical and cost advantages.

Close to customers around the world

As an international company, KraussMaffei has a presence in all the major markets for the plastics and rubber processing industries and employs around 3,000 people worldwide. Our sales and service network keeps us close to all our customers around the world.

KraussMaffei training puts you on the road to success



Packaging

KraussMaffei develops, manufactures and supplies advanced reaction process machinery and systems. Operating, monitoring and maintaining this type of equipment requires qualified and well-trained people in your company. KraussMaffei's specialized training courses, with high hands-on content, ensure that your employees acquire the skills, confidence and experience they need to maximize performance and minimize downtime on your KraussMaffei machines.

This is always our target in planning and delivering our training courses. Introductory and advanced courses cover the operation, control and maintenance of KraussMaffei's reaction process machinery. We also run special courses and individual training programmes on topics of your choice. With ample practice on original KraussMaffei machines, our courses boost your employees' skill levels, confidence and experience – key success factors for your business. This brochure sets out our standard training programme, including recommendations for follow-on courses.

Practical training courses at KraussMaffei

KraussMaffei brings success

This year the main focus of our training programme is again on the operation and maintenance of our RIM-Star and Comet series, together with a good grounding in the theory and practice of PUR processing offered in the PUR foundation course.

Your advantage

We train your operators to a high standard so that you can make the best use of the features and benefits of your KraussMaffei reaction process machines.

Our concern

In a KraussMaffei course, the function, operation and maintenance of our machines are explained clearly and simply and practised thoroughly. The result: a noticeable improvement in the quality of work, higher productivity and successful trouble-shooting.

Your opportunity

Detailed expert knowledge of your reaction process machine.

Optimal training of your staff members leads to:

- shorter set-up times
- improved product quality
- higher productivity
- systematic trouble-shooting

Other languages and special courses

The courses in this programme can be held in German or English, or, with an interpreter, in any language of your choice.

Please contact KraussMaffei for information on dates, fees and conditions for courses in English or other languages.

We will also run customer courses on operation and maintenance in your factory or on our premises.

Training courses will also be held in other localities (eg, in KraussMaffei Sales and Service Centers around the world). We will contact you to let you know the details of training courses being planned in your area.

For example:

- CCM Clear Coat Moulding
- LFI Long Fiber Injection
- Spraying technology
- Colour metering
- Multicolour technology
- Multicomponent technology
- Older control systems and older machinery series on request

Other special subjects according to your requirements. Please contact us for more details!

Download this training course programme from www.kraussmaffei.com

Basics, functions, operation and maintenance

Basics

PUR 1 day
Basic principles of polyurethane technology
Page 6

Specialization

» **RS 07 / RS 08** 2 days
Operation Pump metering machine RimStar with PUC07/ PUC08 computer
Page 7

» **KK 07** 2 days
Operation Piston metering machine Comet with PUC07 computer
Page 8

» **EcoStar** 2 days
Operation Pump metering machine EcoStar
Page 9

» **MKP** 2 days
Mixing head and pump course
Page 10

» **MKE-3B** 1 day
Repairing MKE-3B mixing heads
Page 11

FCS 1 day
Operating the FCS process unit
Page 12

⌞
Precondition for successful participation is previous attendance at an ABB robot course and knowledge about the metering machine

Individual

SPECIAL COURSES

Basic principles of polyurethane processing

Learning goal

Course participants learn about the chemistry, formulation and storage of polyurethane raw materials, their behaviour during chemical reaction and factors influencing the reaction, safety issues and the correct handling of the components.

Course content

- General principles of plastics materials
- Polyurethane grades and products
- Polyols and their additives
- Isocyanate
- Behaviour and influences during chemical reaction
- Definition of terms
- Use of blowing agents
- Safety precautions and possible risks in handling PUR raw materials
- What to do in case of accidents
- Assessing physical values in the finished product
- Reactivity check (cup test)

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



Operation of the RimStar pump metering machine with PUC07/PUC08 computer

Learning goal

Course participants learn about the structure of the machine, modes of operation and control, computer operation, fault localization, and how to optimize machine settings.

Course content

- Mechanical construction of the RimStar machine
- Safety equipment
- Machine sequence demonstrated with flow diagrams
- Operating the machine from the control cabinet
- Structure of the PUC07/PUC08 computer and decentralized peripherals
- Basic principles of data-exchange via PROFIBUS
- Understanding all menu pages and input parameters
- Computer operation with hands-on exercises
- Localizing malfunctions with the aid of the computer

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



Operation of the Comet piston metering machine with PUC07 computer

Learning goal

Course participants learn about the structure of the machine, modes of operation and control, computer operation, fault localization, and how to optimize machine settings.

Course content

- Mechanical construction of the Comet machine
- Safety equipment
- Machine sequence demonstrated with flow diagrams
- Operating the machine from the control cabinet
- Structure of the PUC07 computer and decentralized peripherals
- Basic principles of data-exchange via PROFIBUS
- Understanding all menu pages and input parameters
- Computer operation with hands-on exercises
- Localizing malfunctions with the aid of the computer

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



Operation of the EcoStar pump metering machine

Learning goal

Besides the structural aspect and operation and handling of the machine and the control terminal, course participants learn how to pin-point malfunctions and optimize machine settings. Instruction is also given on how pumps and mixing heads operate, and the correct way of handling and adjusting them.

Course content

- Mechanical construction of the pump metering machine
- Machine sequence demonstrated with the aid of flow diagrams
- Handling the operator panels and understanding menu pages
- Construction of mixing heads and method of operation
- Nozzle changing and foam dispenser pressure setting
- How the metering pumps work
- Ways of setting the output rate
- Flow-rate control by frequency converter

- Maintenance of the whole machine
- Hands-on operating experience and practical exercises on the machine

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



EcoStar

Mixing head and pump course

Learning goal

Course participants learn how mixing heads and pumps operate and how to handle, dismantle, reassemble and maintain them.

Course content

Mixing head

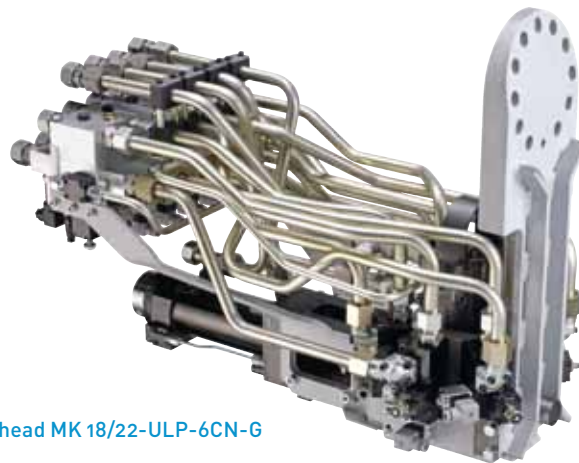
- General introduction to mixing head models
- Explanation of construction and operation
- Nozzle selection and changing and foam pressure settings
- Hydraulic and electric actuation
- Identification of mixing head malfunctions
- Maintenance and service
- Hands-on exercises with mixing heads

Metering pumps

- Pump operating principle
- Effect of different operating conditions on the pump's response
- Ways of adjusting the pump's output rate
- Output control
- Maintenance and servicing
- Hands-on exercises on pumps
- Magnetic couplings

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



Mixing head MK 18/22-ULP-6CN-G

Repairing MKE-3B mixing heads

Learning goal

Course participants learn about the structure of this mixing head model, together with operating methods and correct handling. Through practical exercises, they will also learn to repair the mixing head by themselves.

Course content

- General introduction to the mixing head models
- Explanation of construction and operation
- Hydraulic and electric actuation
- Selecting and changing nozzles
- Identifying mixing head malfunctions
- Practical exercises in dismantling, repairing and sealing a mixing head, as well as assembling and installing it, with subsequent function test.

Please note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



Mixing head MKE-3B

Operating the FCS processing unit (Fiber Composite Spraying)

Learning goal

Participants will learn how the FCS processing unit is constructed, how it functions and how to operate it. Also how to work with the FCS-specific parameters and menus in the PUC07 and how to program the ABB robot for the spray process.

Participation requirements

- Familiarity with the function and operation of a polyurethane metering machine, for example, a completed RS 07 seminar (page 7)
- Familiarity with the function and operation of a robot, for example, a completed ABB PHG robot course. Besides basic knowledge of the S4 or IRC5 control system (RAPID), the course should also have covered the programming of modules and routines.

Course content

- Design of the FCS processing unit
- Processing unit function: spraying with and without glassfibre
- Cutter unit function and operation, set-up and maintenance
- Technical basics of spray technology
- The roving guide systems, threading up the glass fibre
- The roving cabin and extraction system
- Function and set-up for the mixing head cleaning unit
- FCS-relevant input parameters and menus in the PUC07 process data capture system
- Programming the ABB robot for the spray process

Note

Each participant receives full course documentation at the start of the course and a Certificate of Attendance when it ends.



MK 6,0-4K-S-F

Course registration

By phone: +49 89 8899-3155

Email: joerg.elstner@kraussmaffei.com

By post: Jörg Elstner
Dept. KS223
KraussMaffei Technologies GmbH
Krauss-Maffei-Str. 2
80997 Munich
Germany

By fax: +49 89 8899-1783
For fax reply form please see reverse

Internet: www.kraussmaffei.com

Course registration 2011

Please complete and fax to: +49 89 8899-1783

Personal details

Company

Employer

Department

Phone

Postcode

Town

Fax

Street, house number / PO box

Email

Course participation

Name of training course

Name of training course

Date

Date

Name, first name of participant

Name, first name of participant

Vocational training

Vocational training

Working in

- Training
- Maintenance (mechanical systems)
- Maintenance (electrical systems)
- Design / Project planning
- Production
- Other:

Working in

- Training
- Maintenance (mechanical systems)
- Maintenance (electrical systems)
- Design / Project planning
- Production
- Other:

Date of arrival

Date of departure

Hotel reservation by KraussMaffei required?

- Yes No

Hotel name (optional)

Place, date

Signature

ACCOMMODATION

Hotel suggestions

Notes for air passengers

Munich airport is a considerable distance from the city, so that the cost of a taxi to KraussMaffei in Munich-Allach is relatively high. Taking the S-Bahn (suburban train) is quite a lot cheaper. At the airport follow the green signs.

Take the S1 from the airport to Laim, where you must change to the S2 going to Dachau Petershausen. Get off the train at Allach. KraussMaffei is right next to the station. The main gate is about 5 minutes walk.

Or you can take the Airport Line S8 into town. At any station between “Ostbahnhof” and “Laim” you can change to the S2 going to Dachau/Petershausen. Get off this train at Allach. KraussMaffei is right next to the station. The main gate is about 5 minutes walk.

If you come to KraussMaffei by car, please use the Visitors’ Car Park.

Hotel Lutter (B&B only)

Eversbuschstraße 109, 80999 München-Allach
Phone +49 89 8127004, Fax +49 89 8129584
hotel-lutter@t-online.de
Prices from € 70.– per night

Hotel Westside (B&B only)

Eversbuschstraße 192, 80999 München-Allach
Phone +49 89 892685-0, Fax +49 89 892685-333
mail@westside-hotel.de
Prices from € 93.– per night

Parkhotel Edelweiß

Menzinger Straße 103
80997 München-Obermenzing
Phone +49 89 8111001, Fax +49 89 81039982
info@edelweiss-parkhotel.de
Prices from € 64.– per night

Hotel Central

Münchner Straße 46a, 85221 Dachau
Phone +49 8131 564-0, Fax +49 8131 564-121
info@hotel-central.dachau.de
Prices from € 80.– per night

Eden Hotel Wolff

Arnulfstraße 4, 80335 München
Telefon +49 89 55115-0, Fax +49 89 55115-555
info@ehw.de
Prices from € 109.– per night

Intercity Hotel

Bayerstraße 10/am Hbf., 80335 München
Phone +49 89 44444-0, Fax +49 89 44444-599
muenchen@intercityhotel.de
Prices from € 80.– per night

Hotel Econtel

Bodenseestraße 227, 81243 München
Phone +49 89 87189-0, Fax +49 89 87189-400
info@econtel.de
Prices from € 82.– per night

Tourist Office / Fremdenverkehrsamt

Sendlinger Straße 1, 80331 Munich, Germany
Phone +49 89 2330300, Fax +49 89 2330233

Prices quoted do not apply during fairs/exhibition periods.
Prices subject to change without notice.
You’ll find more hotel suggestions at
www.kraussmaffei.com/contact/hotels

Participation conditions

Registration

Send applications for registration to:

1. Course organizer

KraussMaffei Technologies GmbH
Department KS223, Jörg Elstner
Krauss-Maffei-Str. 2, 80997 Munich, Germany
Phone +49 89 8899 3155
Fax +49 89 8899 1783
Email: joerg.elstner@kraussmaffei.com
www.kraussmaffei.com
Please use our registration form on page 14.

2. Validity

These participation conditions apply only to enterprises in the sense of §§ 14, 310 Section 1 BGB (German Civil Code).

3. Registration and conclusion of contract

By registering the participant accepts the conditions for participation. Registration may be completed in writing or by using the online registration form. Registrations are always handled on a first-come-first-served basis. The contract is concluded at the time the registration confirmation is received. Secure your course place by registering early! Please register no later than four weeks prior to the beginning of a course. Please use our registration form. Can't find your course? Simply contact us! Course dates may be changed on request.

4. Conditions for participation

During the courses, participants carry out practical, hands-on exercises. For this reason, the number of course participants is limited to ensure success. The earlier you book your course, the higher your chances of getting your preferred dates. We will confirm participation on receipt of your written registration form.

5. Services supplied

The participants will be trained by instructors in theory and practice. Each participant will receive course documentation at the beginning of the course and a certificate when the course is completed. The use of modern teaching aids is guaranteed in advanced training courses. Participants are entitled to a free lunch in our company cafeteria on each course day. Participation fees cover the cost of all course documentation, the cost of using all technical equipment, beverages in the breaks and lunch in the cafeteria. Travel and accommodation for participants is not included.

6. Hotel reservations

KraussMaffei can book a hotel room on your behalf. If you would like us to do so, please complete the relevant sections of the registration form.

Krauss Maffei will not be in any way liable for availability or for any hotel services. Participants are responsible for paying their own accommodation costs.

7. Payment terms

A flat fee is charged per participant and course. No discounts are given. The fees for courses in German are listed for each course. All amounts are shown exclusive of VAT. Please quote the course number or abbreviation on all correspondence and payments. The fee is due and payable upon receipt of the invoice. Payment must include the invoice number.

8. Cancellations

The participant may cancel up to 14 days before the start of the course. Written cancellations after that date entitle the course organizer to charge or retain 50% of the course fee as a flat fee. Cancellations within one week prior to the beginning of the seminar pay the full cancellation fee (100%). The cancellation fee will be waived if a replacement participant is named. If the organizer is forced to cancel the event, any payments already received will be refunded; any other claims are excluded.

9. Course cancellations and changes

KraussMaffei reserves the right to cancel, reschedule, or combine published courses in the event of an insufficient number of participants, non-availability of the instructor, force majeure, or for important reasons that are beyond KraussMaffei's control. The participant will be notified immediately and payments already received will be returned. All other claims of any kind are excluded unless the organizer acted with intent or with gross negligence. The organizer has the right to replace trainers or modify the agenda if there is a good reason to do so, eg, if the trainer becomes ill, as long as this is reasonable towards the course participants.

10. Liability

The organizer is only liable for damage that was caused intentionally or through gross negligence. Liability for a violation of major contractual obligations and injuries to life and limb or health is not affected. In the event of a violation of the above-mentioned contractual obligations the claim for damages shall be limited to typically foreseeable damages.

11. Copyright

The course documentation and the computer software used are copyright. The duplication of course documentation for unauthorized purposes, forwarding, use and disclosure of its contents to third parties is prohibited. Violations are subject to claims for indemnification.

12. Severability Clause

In the event that individual clauses of these provisions are invalid, the validity of the remaining clauses remains unaffected. The invalid clause will then be replaced with another clause that meets the economic intent of the invalid clause as closely as possible.

13. Applicable law and place of jurisdiction

German law applies to all disputes regarding and in connection with the legal relationship between the parties. Place of jurisdiction is the Munich courts.

14. Note on courses in languages other than German

Courses in languages other than German are special courses. Please arrange duration, content and fees with the training manager. If we do not have trainers fluent in your language, we can discuss the option of working with an interpreter.

HOW TO FIND US

Routes to Munich



Arriving by car

If you come to KraussMaffei by car,
please park at the visitors parking area.

HOW TO FIND US

Allach and surroundings



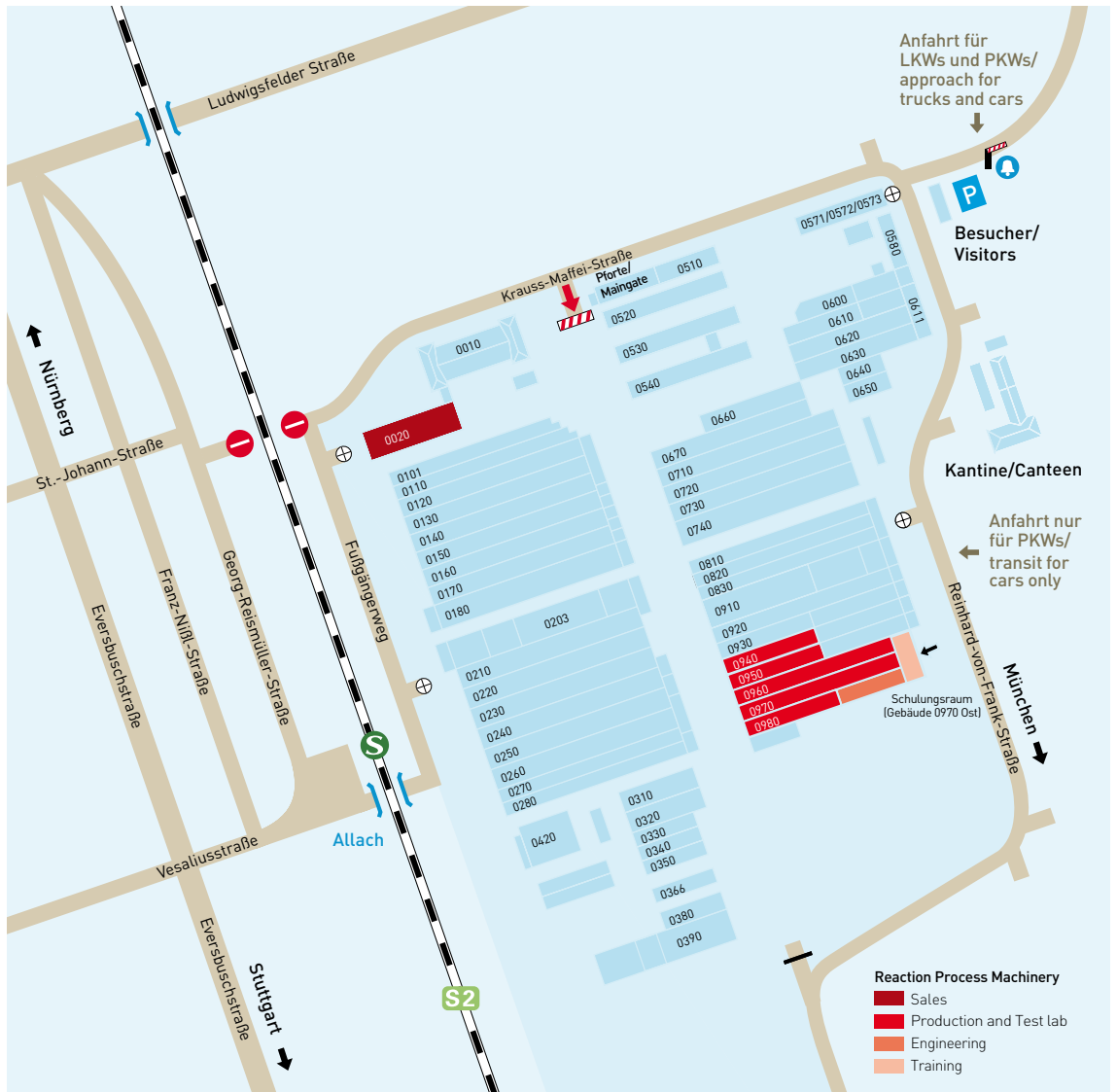
Arriving by train or airplane

You can take the S-Bahn S 1 or S 8 with direction city from airport Munich to Hauptbahnhof (main station).

From there you get to KraussMaffei within 15 minutes with the S-Bahn S 2 with direction Dachau/Petershausen to the station „Allach“. This is the station right in front of our premises.

HOW TO FIND US

KraussMaffei plant



Coordinates for your navigation system
48° 11' 38" N / 11° 28' 31" E

KraussMaffei is a premium partner for the plastics and rubber processing industries worldwide. KraussMaffei machines and systems are used wherever plastics and rubber are converted into products. As a knowledge-driven technology company, we build on many decades of experience and a strong commitment to research and development.

Training courses with high hands-on content:

we offer training courses for you and your employees in our Munich training centre or on your premises anywhere in the world. Our course programme has two broad categories. One category is basic and advanced training in the operation, control and maintenance of KraussMaffei reaction process machinery.

The other category covers courses on special techniques and customized courses planned for individual customers. In all courses, there is a major focus on extensive, hands-on experience on KraussMaffei machines. Our courses boost your employees' skill levels, confidence and experience – key success factors for your business.

KraussMaffei Technologies GmbH

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