

## REFRA-Training Example of seminar programme.



## REFRA-Training International From instruction to implementation.

### General information

Training sessions, workshops and seminars organized at regular intervals for customers and their personnel involved in refractory affairs constitute a substantial part of Refratechnik's service and after sales care. So, to keep our customers worldwide instantly updated, regular invitations to attend these technical events are issued. Actually, all of these activities are assembled under the label „REFRA-Academy“.

The 11-day REFRA-Training course for supervisors and the responsible staff provides intensive and practical instruction in the knowledge and skills required for reliable and long-term use of refractory materials.

Detailed know-how of refractory materials and optimum installation techniques are an important precondition for an efficient use and maximum lifetimes in cement producing installations.

### The REFRA-Training International is focussing on topics such as:

- basic knowledge of refractory materials, selection and application of refractory bricks and concretes, mortars
- training on brick installation in rotary kilns and the different methods applied (e.g. using the REFRA-Rig II refractory lining machine)
- selecting suitable linings for problem areas in rotary kilns or static units (e.g. relining of areas with deformed kiln shell in an optimum manner)
- practical exercises in the application of unshaped refractories applying the casting or gunning method
- extensive information on quality control and test methods in the manufacture of Refratechnik's refractory products
- influences exerted on the refractory lifetime by process conditions, burners and use of alternative fuels.



## REFRA-Training International Learning by doing.

### **Basic theory**

During the REFRA-Training, the basic theory on refractories is acquired and enhanced in the morning sessions. State-of-the-art presentation devices are available for this purpose.



### **Practical training**

Practical exercises are mainly done in the afternoon. For this purpose, a rotary kiln segment on which the use of the REFRA-Rig II refractory lining machine is shown, as well as a satellite cooler tube for demonstrating and practising proper bricklaying are available on site. How to prepare and apply unshaped refractories by casting is practised for instance using suitable mixers and vibrators.

The application of refractory concretes by gunning chosing the respective gunning machines are demonstrated, and the different types of gunning nozzles available are explained.



## REFRA-Training International Trainers and workgroups.

### Trainers

Experienced engineers and supervisors who have several decades of experience in selecting and using refractory materials in the cement industry are available as lecturers and trainers.



### Exchange of experience

Studying together with a group of engineers from around the world, with a focus on interaction, networking, and knowledge sharing, will ensure an ideal learning environment and ultimately provide long lasting strategic relationships. In case of numerous participants, workgroups are chosen for efficiently taking part in the practical seminar performances.

The seminar mainly aims at providing a basic knowledge of refractory materials and their reliable and secure use. Of course, to regain mental energy to continue studying, there will be enough free time for a rest. A supporting programme in the evenings will also give the opportunity to discuss the technical lectures in more detail together with the REFRA-Training Team.



REFRA-Training International  
Benefits, fees and certificates for our successful participants.

**Benefits and fees**

**Benefits**

Complete documentation, accommodation in single bedrooms in good hotels, full board (breakfast, lunch, beverages during breaks, and dinner) as well as transportation during the seminar and the excursions.

**Language**

The REFRA-Training International is held in English language. Participants should therefore have at least a basic knowledge of the English language.

**Fees**

This 11-day course costs € 9.500.- (standard price, travelling expenses excluded).

**Cancellation fee**

Up to 61 days before start of the course: no cancellation fee;

up to 60 days before start of the course: 33% of total price will be charged (taxes and fees excluded);

up to 30 days before start of the course: 100% of the total price will be charged (taxes and fees excluded).



**Certificate**

At the end of the Seminar, the participants can show their acquired knowledge in a final test and receive a certificate confirming their successful participation.

### Day of arrival

Official reception at  
**InterCityHotel Göttingen**  
Bahnhofsallee 1a  
37081 Göttingen  
Tel: +49 551 5211 0  
Fax: +49 551 5211 500  
goettingen@intercityhotel.de  
www.intercityhotel.com/en/  
Goettingen

Dinner

### Day 1

Bus transfer from the hotel to  
Refratechnik

**Welcome to Refratechnik and  
introduction into the seminar  
programme**

**Introduction to the world  
of Refratechnik**

Coffee break

**Classification of refractories:  
Industry standards for  
refractory materials, their  
classification and properties**

Lunch

**Quality assurance system  
for refractory materials  
and testing methods in  
the refractory industry**

**Workshops in three groups**

**Visiting the plant**

**Visiting the Research &  
Development Department**

**Visiting the Technical  
Department**

Bus transfer to the hotel

Dinner

### Day 2

Bus transfer from the hotel to  
Refratechnik

**Installation of refractory  
materials in rotary kilns**

Coffee break

**Installation of refractory  
materials in rotary kilns**

Lunch

**Workshops in four groups**

**REFRA-Rig II  
Installation tools, laying bricks  
as clench lining or with mortar  
Keying of brick linings**

**Raw materials  
Wear phenomena  
Laboratory test methods  
Mortars**

Bus transfer to the hotel

Dinner

### Day 3

Bus transfer from the hotel to  
Refratechnik

**Layout of a new clinker  
burning unit**

Coffee break

**Wear phenomena of refractory  
materials, particularly when  
using waste fuel and their  
influence on the brick life**

Lunch

**Workshops in four groups**

**REFRA-Rig II  
Installation tools, laying bricks  
as clench lining  
or with mortar  
Keying of brick linings**

**Raw materials  
Wear phenomena  
Laboratory test methods  
Mortars**

Bus transfer to the hotel

Dinner

### Day 4

Bus transfer from the hotel to  
Refratechnik

**Using process parameters to  
assess refractory performance**

Coffee break

**Case study – Using process  
parameters**

**Chemical and thermal  
requirements for an optimum  
refractory lining lifetime**

Lunch

**Kiln hot alignment and the  
influence of misalignment  
on the refractory life**

Coffee break

**Kiln shell ovality  
and measuring methods**

Bus transfer to the hotel

Dinner

**Days 5-7  
Excursion with plant visit**

### Day 8

Bus transfer from the hotel to  
Refratechnik

**Monolithics, Part 1:  
REFRA-Line, monolithic  
refractory systems, solutions  
for installation technologies**

Coffee break

**Monolithics, Part 2:  
Monolithic refractory materials,  
installation in different units of  
the cement plant**

Lunch

**Workshops divided into three  
groups**

**Mixing and casting under  
special conditions**

**Gunning of refractory materials**

**Mixing, casting and densifying  
of low cement castables**

Bus transfer to the hotel

Dinner

### Day 9

Bus transfer from the hotel to  
Refratechnik

**Insulation of refractory linings**

Coffee break

**Anchor systems in castable or  
brick lining in different vessels**

Lunch

Bus transfer to the hotel

Remaining afternoon hours are  
free

Dinner

### Day 10

Bus transfer from the hotel to  
Refratechnik

**Drying out and heating-up of  
refractory linings**

**Kiln shell corrosion**

Coffee break

**Burners – Influence of flame,  
flame shape on the refractory  
lining**

Lunch

**Use of alternative fuels in the  
cement industry and practical  
experience from waste fuel bur-  
ning in German cement plants**

Bus transfer to the hotel

Dinner

### Day 11

Bus transfer from the hotel to  
Refratechnik

**New products and future  
developments of refractories**

Coffee break

**Presentation of results of  
refractory samples taken from  
casting, gunning, etc.**

Final test

Lunch

**Test results and discussions**

Bus transfer to the hotel

Farewell dinner

### Day of departure



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