

Planning : 2022 Aachen ECerS/ FIRE SCHOOL : ECO-DESIGN OF REFRACTORIES

The day before	1 st day – June 28 th	2 nd day – June 29 th	3 rd day _ June 30 th
Morning	8h – 12h Training courses	8h-12h Training courses	8h-9h Welcome and presentation of Tata steel plant 9h-11h Steel making Conferences 11h – 12h Discussion Brain storming Evaluation questionnaire
	Lunch	Lunch	Lunch
Afternoon Welcoming the participants Delivery of course documents and badges	13h30 -17h30 Training courses	13h30 – 15h30 Training courses 16h Departure for Ijmuiden	13h30 -16h15 Visit of the steel plant 16h30 End of the 3 rd FIRE School
Evening Welcome dinner	18h – 22h Poster session Exchange between participants Exhibition Cerami°K Gala dinner	19h Arrival at the hotel 19h30-21h Dinner	

E for Ecological, Economical, Eco energetical

	1 st day
Morning	<p><u>SESSION 1</u> Refresher course of basic knowledge</p> <p>➤ 8h-8h10 : Introduction of Aachen FIRE School <i>Sido Sinnema, Chris Parr / Thorten Tonnesen, Jacques Poirier</i></p> <p>Raw materials and shaped refractories 8h10-8h55: Alumina, High alumina, others <i>Dr. Andus Buhr – Almatiss</i> 8h45-9h40 Basic refractories : raw materials, design, formulation, working properties, future innovations <i>Dr. Erwan. Guéguen - RHI MAGNESITA</i> 9h40-10h Break</p> <p>Monolithic refractories 10h-11h: part 1 LCC and ULCC design, formulation, working properties, future innovations <i>Dr Bruno Touzo - CALDERYS</i></p> <p>11h-12h: Part 2 NCC Design, formulation, working properties, future innovations : implementation, installation, drying, future innovations <i>Dr Hong Peng - ELKEM</i></p>

E for Ecological, Economical, Eco energetical

	1 st day
Afternoon	<p><u>SESSION 2 : The fundamentals</u></p> <p><i>Corrosion, Fluid and gas reactive transportation in refractories</i></p> <p><i>13h30-14h30 Thermodynamic and kinetics</i></p> <p><i>Pr. In Ho Jung, Seoul National Univ.</i></p> <p><i>14h30-15h30 Fluid and gas reactive transportation</i></p> <p><i>Thorsten Tonnesen , RWTH university</i></p> <p>15h30 -16h Break</p> <p>Thermo-mechanics</p> <p><i>16h-17h30 Fracture and creep of refractories</i></p> <p><i>Pr. Harald Harmuth, Dietmar Gruber, Shenghi Jin, Leoben University</i></p>
Evening	<p>18h – 22h Exchange between participants</p> <p>Exhibition Cerami°K, Video session, Poster session</p> <p>Gala dinner</p>

E for Ecological, Economical, Eco energetical

2nd day

Morning

SESSION 3 Industrial and economic needs

8h-8h45: Refractories values in use

Tata Steel Netherlands (TSN)

8h45 – 9h30: From industrial needs to industrial implementations, how to innovate? What approach?

Dr. Chris Parr, Dr. Chistoph Wöhrmeyer , Imerys

9h30-10h Break

SESSION 4 Future challenges for refractories

10h-10h45: Sensors, instrumentation and refractory needs : at the scale of laboratory and industrial installations

Pr. Emmanuel de Bilbao, Cemhti/univ Orléans

10h45 -12h: Challenges for data mining and machine learning in the refractory industry and end-users

Matheus Santos and Pr. Victor C. Pandolfelli, Universidade Federal de São Carlos

12h -12h45 Circular economy: ecology, energy, economy

*Dr. Carmen Baudín, Instituto de Cerámica y Vidrio, CSIC
and Margarita Alvarez, Alfran*

E for Ecological, Economical, Eco energetical

	2 nd day
Afternoon	<p><u>SESSION 5 Refractories for Steel Making</u></p> <p>14h-15h : Refractories for steelmaking : critical wear factors and optimum choice <i>Dr. Philippe Blumenfeld and Pr.Jacques.Poirier, Arcelor Mittal/CEMHTI, university of Orleans</i></p> <p>15h-15h45 Improvement of steel cleanliness (45 min) <i>Pr. Christos Aneziris, University of Freiberg (video conference)</i></p> <p>16h Departure for Ijmuiden</p>
Evening	<p>19h -21h Arrival at the hotel, Dinner</p>

E for Ecological, Economical, Eco energetical

3rd day

SESSION 5 (continued)

Refractories for Steel Making

Morning

8h-9h: Welcome and presentation of Tata steel plant

9h-10h: The new face of the steel industry (electric x blast furnace)

Dr. Paul van Beurden ,Tata Steel Netherlands (TSN)

10h-11h CO₂ management and Production of iron by H₂ –
consequences for refractories

Dr. Paul van Beurden , Tata Steel Netherlands (TSN)

11h-12h

Discussion

Brain storming

Evaluation questionnaire

E for Ecological, Economical, Eco energetical

	3rd day
Afternoon	<p>13h30 -16h30 Visit of Tata steel plant</p> <p>13h45 Presentation IJmuiden Visits</p> <p>14h00 Film</p> <p>15h00 Continuous Caster</p> <p>15h45 Hot strip Mill 2</p> <p>16h30 End of the FIRE School</p>