



1st Workshop Hi-TRACE

Industrial Process Optimisation Through Improved Metrology of Thermophysical Properties

online event
on Tuesday, 21 January 2021

The goal of this workshop is the presentation of the main results of the project to stakeholders and end-users as well as to industry and research to get feedback from them.

The project Hi-TRACE will establish new methods for characterising the thermophysical properties of any solid material up to 3000 °C, and launch a network of reference facilities and materials available to industry. By supporting reliable measurement practices, this project will improve the understanding of high-temperature materials and enable industries to develop novel and innovative materials.

The 1st Workshop Hi-TRACE will be organised as online event by ZAE Bayern and FHWS in cooperation with LNE and all other partners of the project.

Registration (free of charge)

To participate in the workshop, please send an e-mail to

hi-trace@zae-bayern.de

You will get a confirmation together with a valid dial-in link for the workshop.



Schedule of the Online-Workshop: Forenoon on 21.01.2021

time	title	speaker
08 ³⁰	Start of the video conference tool and opportunity for dialling-in and testing the functionality	
Section 1: Industrial need for improved metrology (presentations with open questions)		
09 ⁰⁰ till 09 ¹⁰ (10 min)	Welcome	H.-P. Ebert ZAE
09 ¹⁰ till 09 ¹⁵ (5 min)	Introduction	B. Hay LNE
09 ¹⁵ till 09 ⁴⁰ (25 min)	Need of high-precision instruments for thermophysical properties measurement	T. Denner Netzsch
09 ⁴⁰ till 10 ⁰⁵ (25 min)	The importance for space application to manage accurate thermal material properties	M. Cataldi, G. Pinaud Ariane Group
10 ⁰⁵ till 10 ³⁰ (25 min)	New SiC-based materials for nuclear fuel cladding	C. Lorrette CEA
10 ³⁰ till 11 ⁰⁰ (30 min)	Coffee break	
Section 2: Industrial need for improved metrology (presentations with open discussions)		
11 ⁰⁰ till 11 ²⁰ (20 min)	Additive manufacturing metal and ceramic components: sensors for surveillance of process parameters	J. Hartmann FHWS
11 ²⁰ till 11 ⁴⁰ (20 min)	Characterisation of functional materials with outstanding thermophysical properties	S. Vidi ZAE
11 ⁴⁰ till 12 ³⁰ (50 min)	Virtual lab-tour with multi-media demonstrations and discussions	J. Manara ZAE
12 ³⁰ till 14 ⁰⁰ (90 min)	Lunch break	

Schedule of the Online-Workshop: Afternoon on 21.01.2021

time	title	speaker
Section 3: Status and results of Hi-TRACE (presentations with questions and comments)		
14 ⁰⁰ till 14 ¹⁵ (15 min)	Presentation of the project	B. Hay LNE
14 ¹⁵ till 14 ³⁰ (15 min)	Work package 1: Establishment of traceability for thermal diffusivity measurements at temperatures up to 3000 °C	B. Hay LNE
14 ³⁰ till 14 ⁴⁵ (15 min)	Work package 2: Establishment of traceability for specific heat measurements at temperatures up to 3000 °C	S. Vidi ZAE
14 ⁴⁵ till 15 ⁰⁰ (15 min)	Work package 3: Establishment of traceability for emissivity meas. and improved metrology for temp. of fusion at temp. up to 3000 °C	K. Anhalt PTB
15 ⁰⁰ till 15 ¹⁵ (15 min)	Work package 4: Establishment of methods for quantifying de-bonding at high temperature (above 1000 °C)	J. Wu NPL
15 ¹⁵ till 15 ³⁰ (15 min)	Questions and comments	all
15 ³⁰	Close of the workshop	

Hi-TRACE project has received funding from the EMPIR programme co-financed by the Participating States and from the European Union's Horizon 2020 research and innovation programme

More information can be found on the project website:

www.hi-trace.eu



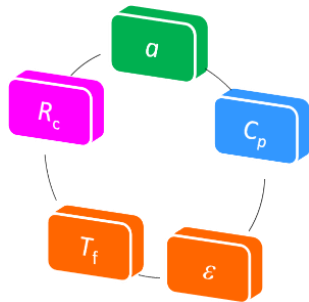
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Many industries such as space, aeronautic, nuclear and glass operate installations at temperatures above 1500 °C. In order to optimise their processes and increase their competitiveness, these industries are developing new materials able to work at higher temperatures. Hence, the project outputs will enable European industries to significantly increase energy efficiency, reduce emissions, enhance safety and improve reliability of critical applications.



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WP 1: Thermal Diffusivity a

The aims of this work package are

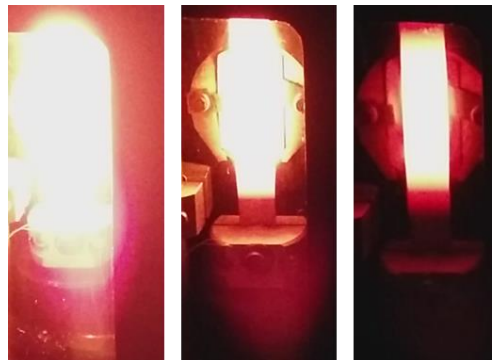
- to establish a reference facility for the traceable measurement of the thermal diffusivity of solid materials at temperatures up to 3000 °C and
- to determine the uncertainty budget associated to the thermal diffusivity measurements at highest temperatures.



WP 2: Specific Heat c_p

The aims of this work package are

- to develop at least one reference facility based on absolute measurement methods, such as drop calorimetry or dynamic techniques (e.g. laser flash or pulse calorimetry),
- to develop validated methods for the traceable measurement of the specific heat of solid materials between 1500 °C and 3000 °C.



WP 3: Emissivity ϵ and Temperature of Fusion T_f

The aims of this work package are

- to establish a reference facility for the traceable measurement of the emissivity of solid materials above 1500 °C based on radiometric or calorimetric methods using pulse or induction heating,
- to use measurements from this new facility to compare results of total hemispherical and normal spectral emissivity measurements obtained with existing facilities and
- to develop validated methods for the measurement of the temperature of fusion of refractory materials up to 3000 °C.



WP 4: Thermal contact resistance R_c

The aim of this work package is to develop and validate methods to quantify the state of interface bonding between solid materials. The idea is to use methods for measuring thermal contact resistance by dynamic heating and the results of this will be used to develop and validate a model for quantifying the state of interfacial bonding (between coating and substrate for example), with a focus on functional layers appropriate for use as thermal or corrosion protection above 1000 °C.

