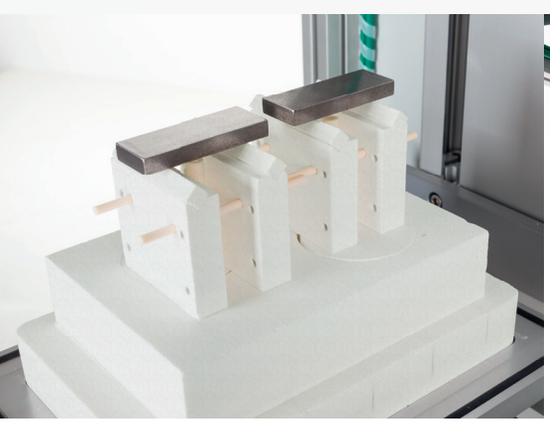
RFDA HT1600-RB

Specialized furnace for mechanical spectroscopy up to 1600 °C on 2 samples

The **HT1600-RB** furnace is designed to perform impulse excitation measurements at elevated temperatures in an air atmosphere or with an inert gasflow on 2 samples simultaneously.

In order to determine the elastic properties and the damping as function of the temperature, measurements are performed in predefined intervals during heating and cooling (1 - 3 °C/min).



Benefits

- **Simultaneous Young's and shear modulus measurements**
- **Damping / internal friction measurements**
- **Room temperature - 1600 °C**
- **Simultaneous characterization of two samples**
- **Air or inert gas atmosphere**
- **Bottom charge furnace for easy sample loading**
- **Sample lengths up to 160 mm**
- **Optimized insulation for carbon-containing refractories**

Specifications

Furnace unit

Internal dimensions:	Length: 208 mm Width: 148 mm Height: 176 mm
Temperature range	Room temperature - 1600 °C
Heating elements	$MoSi_2$ heating elements
Insulation	Light weight refractory brick
Atmosphere	Air atmosphere (inert gas flow optional)
Sample loading	Bottom charge

Measurement supports

The RFDA HT1600-RB is equipped with two general sample holders for small and large (up to 160 mm length) samples. The sample is directly suspended on high quality lightweight refractory brick insulation material or clamped by PtRh wires.

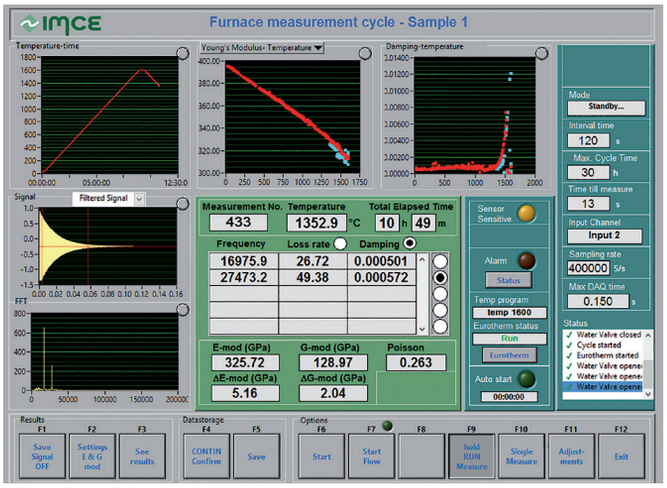
RFDA Professional system

The RFDA HT1600-RB system consists of the RFDA Professional system extended with the HT1600-RB furnace.

Contact us for more information about the RFDA Professional system or visit our website **www.imce.net**.

RFDA HT1600-RB software

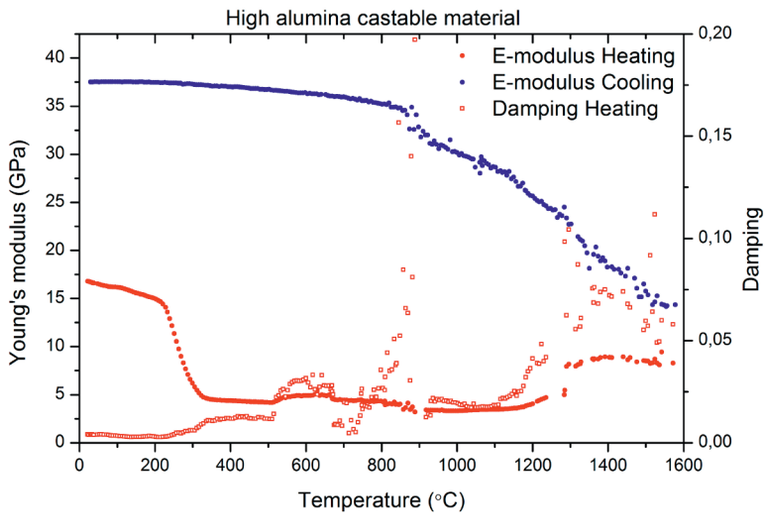
- Analysis software to determine the Young's modulus, shear modulus, Poisson's ratio, internal friction and resonant frequency.
- Setting up a heating cycle for the furnace and an IET measurement cycle.
- Separate measurement cycles on two monitors.



Measurement example

The obtained elastic properties at elevated temperatures give a detailed insight into the extent of material bonding and its behavior under stress and rude conditions around 1600 °C. The Young's modulus curve decreases significantly at around 300 °C which is characteristic of the dehydration of the cement in the concrete.

After 800 °C, the Young's modulus increases up to the maximum temperature which indicates a sintering process in the material. The damping phenomena are high at about 880 °C and 1284 °C characterizing the imperfection that occurs during the crystallization of the cement components and fine elements in the castable refractory material.



Tchamba, A. B. et al. (2015). Thermoelastic properties evolution and damping phenomena of Cameroonian calcined bauxite stabilized with calcium dialuminate refractory cement. Ceramics International, 41(1), 53-59.

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