

Drop Shape Analyzer DSAHT



Get deep insights into the thermal behavior of materials

Our Drop Shape Analyzer – DSAHT goes to the extreme when it comes to wetting and deformation analysis of melts and combustion residues. With temperatures up to 2000 °C in a various range of atmospheric conditions, the instrument analyzes melting solids and helps to understand the interactions that occur when melts come into contact with solid material. This knowledge supports you in optimizing combustion, firing, or coating processes in order to create stable end products, save energy during the process, or prolong the service life of your furnaces.

Tasks and applications

- Measuring adhesion and wetting of metal slags in smelting plants
- Detecting reactions between the glass and refractory bricks in glass production
- Optimizing wetting of the carrier material by enamel coatings
- Investigating the changes of the green body depending on temperature and time in ceramics production

Measuring methods and options

- Contactless wetting analysis using contact angle measurement at temperatures up to 2000 °C
- Observing and recording material deformation as a function of temperature and time
- Measurement in oxidizing or reducing atmosphere, under inert gas, or in vacuum

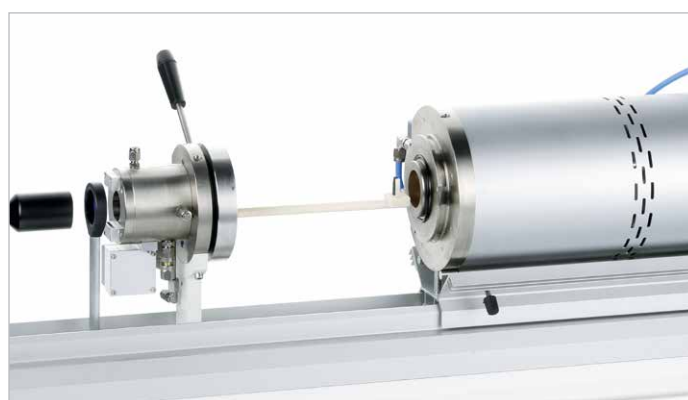
Wetting analysis using precise contact angle measurement

The DSAHT optically determines the contact angle between a liquid and a solid as a direct measure of wetting. Moreover, the surface tension of the hot liquid can be calculated from the curvature of the drop.

The instrument is equipped with a high-resolution camera, which records the sample while being heated up. With special filters that shield the light emitted by glowing materials, a clear shadow image is achieved, ensuring precise contact angle measurement.



DSAHT heating chamber



Easy sample loading into the chamber

Contactless method for undisturbed sample analysis

Loading the furnace with the sample is a matter of seconds thanks to the easy handling of the sample holder. Due to the contactless nature of video analysis with no mechanical stress applied, the shape of the sample only depends on chemo-physical alterations with respect to time and temperature, which are both assigned to each camera image. The powerful image analysis of the ADVANCE software documents exactly what happens with your sample when heated up.

Specifications

Camera system		Temperature measurement	
Connection	ethernet	Accuracy	± 2.5 °C
Illumination		Vacuum control	
Type	halogen, telecentric	Final value	down to 10 ⁻⁵ mbar
Temperature control		Contact angle	
Heating elements	SiC, MoSi ₂ , graphite	Range	0 to 180°
Measuring system	Al ₂ O ₃ , graphite	Resolution	0.01°
Range	up to 2000 °C		

Drop Shape Analyzer

DSAHT

Specifications



Product group specifications	DSAHT1600	DSAHT1800	DSAHT2000
Camera system			
Connection	ethernet		
Optics			
Focus	software-controlled autofocus		
Magnification	1.87×		
Field of view	10 × 14 mm		
Resolution	down to 7 μm		
Illumination			
Type	halogen, telecentric		
Field of light (D × H)	25 × 23 mm		
Measurement specifications with ADVANCE software	DSAHT1600	DSAHT1800	DSAHT2000
Sessile drop			
Result	contact angle		
Range (software-based)	0 to 180°		
Resolution (software-based)	0.01°		
Models	conic section, polynomial, circle, Young-Laplace, height-width		
Types	static		
Constrained Sessile Drop			
Result	surface tension		
Range (software-based)	0.01 to 2000 mN/m		
Resolution (software-based)	0.01 mN/m		
Models	Young-Laplace		

General specifications		DSAHT1600	DSAHT1800	DSAHT2000
Sample dimensions				
Maximum sample space		length: 20 mm, diameter: 7 mm		length: 20 mm, diameter: 5 mm
Temperature control				
Heating element	SiC	MoSi ₂	Graphite	
Measuring system	Al ₂ O ₃	Al ₂ O ₃	Graphite	
Range furnace	up to 1600 °C	up to 1800 °C	up to 2000 °C	
Range sample	up to 1550 °C	up to 1700 °C	up to 2000 °C	
Heating rates		0 ... 1200 °C: 30 °C/min 1200 ... 1600 °C: 20 °C/min > 1600 °C: 10 °C/min		
Cooling rates		1600 ... 1100 °C: 10 °C/min 1100 ... 600 °C: 10 °C/min 600 ... 300 °C: 5 °C/min		
Temperature measurement				
Accuracy		± 2.5 °C		
Internal sensor	thermocouple type S	thermocouple type B	thermocouple type C	
Location		at the sample		
Vacuum control				
Final value	down to 10 ⁻⁵ mbar	down to 10 ⁻⁴ mbar	down to 10 ⁻³ mbar	
Atmosphere	oxidizing, reducing, vacuum	inert, oxidizing, reducing, vacuum	inert, reducing, vacuum	
Instrument dimensions				
Footprint (W × D)	1200 × 400 mm			
Height	400 mm			
Power supply				
Voltage		230 V/16 A		