IKA®

Calorimeters

designed
to work perfectly

A breakthrough in the history of calorimetry!

Our new IKA® calorimeter C 1 represents a giant leap forward in the development of oxygen bomb calorimeters and sets a new standard for the future.

The C 1 calorimeter possesses a high degree of automation while maintaining the smallest footprint on the market, thus changing how calorimeters will be viewed and operated in the future. The C 1 operates with an isoperibol static jacket and a light attachable combustion chamber, which has replaced the traditional heavy screw threaded decomposition vessel. However, the new C 6000 global standards and C 6000 isoperibol calorimeters follow the traditional calorimetric approach similar to our globally approved C 5000 and C 2000 calorimeter models.

Each calorimeter can be operated through a user panel and with our dedicated calorimeter software Calwin C 6040. This software opens up further features in data handling with Microsoft SQL, LIMS and correction calculations that follow many calorimeter standards.

2 Year warranty*

* 1+1 years after registering at www.ika.com/register, glassware and wearing parts excluded

Validation according to DIN EN 61010

CE | TÜV

C 1 Calorimeter | **The Future starts here**

The traditional heavy screw threaded bomb has been replaced by a **light combustion chamber**

Automatic oxygen filling, venting and flushing

Operates either with a chiller (KV 600) or tap water when using the water heater C 1.20

Interfaces for PC (USB-B), printer (serial interface), balance (serial interface)

Automatic ignition with fixed ignition wire as well as ignition energy determination for each experiment

Automatic water filling and draining

Ident. No.	Price	Name	Description	Ident. No.
8804900	12600,- EUR	Package 1/10	C 1	3825000
			KV 600	3410500
8805000	Price on request	Package 1/12	C 1 halogen resistant	4505000
			KV 600	3410500
8805100	Price on request	Package 2/10	C 1	3825000
			C 1.20 Waterheater	4501000
8805200	Price on request	Package 2/12	C 1 halogen resistant	4505000
			C 1.20 Waterheater	4501000

IKA®+

The world's smallest calorimeter ever!

The C 1 oxygen bomb calorimeter is a little giant that sets new standards for the industry. The C 1 represents the smallest isoperibol static jacket calorimeter in the world. IKA® has combined modern technology with unique automation to provide the user with a never before seen experience in the world of oxygen bomb calorimeter and is defining the future for this technology.

C 6000 global standards | **isoperibol**

Easy and convenient **touch screen operation**

SD Card slot for additional data management

Ethernet interface for data management via FTP Server

Decomposition vessel with spherical top for faster heat transfer results in shorter experimental times

Software provides control chart view and correction calculation of globally used standards

RFID technology used for decomposition vessel identification

Easy bomb preparation due to new “turned around” crucible holder technology

Ident. No.	Price	Name	Description	Ident. No.
8804100	29200,- EUR	Package 1/10	C 6000 global standards	3780000
			C 6010	3770000
			KV 600	3410500
8804200	31400,- EUR	Package 1/12	C 6000 global standards	3780000
			C 6012	4504000
			KV 600	3410500
8804300	27600,- EUR	Package 2/10	C 6000 global standards	3780000
			C 6010	3770000
8804400	29800,- EUR	Package 2/12	C 6000 global standards	3780000
			C 6012	4504000
8804500	26200,- EUR	Package 1/10	C 6000 isoperibol	4025000
			C 6010	3770000
			KV 600	3410500
8804600	28400,- EUR	Package 1/12	C 6000 isoperibol	4025000
			C 6012	4504000
			KV 600	3410500
8804700	24600,- EUR	Package 2/10	C 6000 isoperibol	4025000
			C 6010	3770000
8804800	26800,- EUR	Package 2/12	C 6000 isoperibol	4025000
			C 6012	4504000

The C 6000 global standards offers a fast dynamic method, the classical adiabatic as well as isoperibol measurement modes. The C 6000 isoperibol offers the same advantages and features, with the exception of the adiabatic measurement mode.

IKA® +

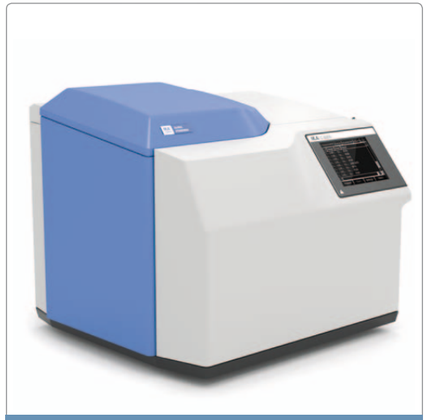
The classical & traditional design with advanced technology!

The software for both calorimeters is handled through a LCD/TFT touch screen which provides many new features that make the daily operation easier and more comfortable. These units also possess a number of modern interfaces which allow connection to networks, PC’s, balances, keyboard, mouse etc.

Available Q1/2013

Available Q1/2013

Technical data	C 1	C 6000 isoperibol | C 6000 global standards
Maximum energy input	40,000 J	40,000 J
Resolution of temperature sensor PT 1000	0.0001	0.0001
Powe ON-time	continuous operation	continuous operation
Operating oxygen pressure	30 bar	30 bar
Display	TFT	TFT with touch screen
Multifunctional push & turn dial	yes	–
Measuring modes	Isoperibol (Regnault Pfaundler)	Adiabatic (Only global standards) Isoperibol (Regnault Pfaundler) Dynamic
Start temperature settings	2 possible settings: 22 °C or 30 °C	3 possible settings: 22 °C, 25 °C, 30 °C
Operator time	< 1 min	< 1 min
Measurements per hour	Isoperibol (Regnault Pfaundler) 5	Adiabatic (Only global standards) 4 Isoperibolic (Regnault Pfaundler) 3 Dynamic 7
Jacket control	static, dry	controlled, water
Reproducibility (using NIST benzoic acid 39j)	Isoperibol (Regnault Pfaundler) 0.1% RSD	Adiabatic (Only global standards) 0.05% Isoperibol (Regnault Pfaundler) 0.05% Dynamic 0.1%
Number of decomposition vessel per unit	up to 4	up to 4
Halogen resistant and catalytic activated vessels available ?	yes	yes
Decomposition vessel ID	manual	automatic (RFID)
Price	**8900,- EUR | Price on request**	**For prices, see page 6**
	C 1: **Ident. No. 3825000**	C 6000 isoperibol: **Ident. No. 4025000**
	C 1 halogen resistant: **Ident. No. 4505000**	C 6000 global standards: **Ident. No. 3780000**



Interfaces	C 1	C 6000 isoperibol | C 6000 global standards
PC	USB-B	USB-B
Printer	9 pin (M) RS 232 serial	9 pin (M) RS 232 serial
Balance	9 pin (M) RS 232 serial	9 pin (M) RS 232 serial
Ethernet	–	yes
SD-Card	–	yes
Automatic oxygen filling / venting / flushing	yes	yes
Automatic water filling / drain	yes	yes
Automatic ignition and ignition energy determination for each experiment	yes	yes
Operated with KV 600		
Water pressure from Chiller	0.3 bar	0.3 bar
Temperature setting: isoperibol 22 °C	20.5 °C	–
Temperature setting: isoperibol 30 °C	28.5 °C	–
Cooling medium	tap water	tap water or distilled with Aqua Pro C 5003.1
Operated with tap water and C 1.20 waterheater		
Tap water temperature range	12 – 28 °C	–
Water pressure max.	1 – 1.5 bar	–
Water pressure min.	–	–
Water consumption per experiment	approx. 4 L	–
General Data		
Languages	D, E, Fr, Sp, Chi, Rus, Pol, I	D, E, Fr, Sp, Chi, Rus, Pol, I
Dimensions opened (W x D x H)	290 x 350 x 400 mm	500 x 450 x 620 mm
Dimensions closed (W x D x H)	290 x 350 x 270 mm	500 x 450 x 420 mm
Weight	15 kg	35 kg
Ambient temperature	20 – 25 °C	20 – 25 °C
Ambient humidity	80%	80%
Voltage	100 – 240 V	200 – 240 V
Frequency	50/60 Hz	50/60 Hz
Power Input	150 W	2000 W
DC Voltage	24 V=	–

Temperature range	-20 – 40 °C
Temperature setting	digital
Temperature display	digital
Temperature sensor internal	PT 100
Resolution of display	0.1 K
Temperature stability at -10 °C	1 K
Refrigerating capacity at 15 °C	0.3 kW
at 0 °C	0.2 kW
at -10 °C	0.14 kW
at -20 °C	0.07 kW
Refrigerant	R134a
Max. delivery capacity of pressure pump	12 l /min
Delivery pressure (head)	max. 0.2 bar
Delivery suction pressure (head)	max. 0.1 bar
Pump connection	M 16 x 1
Pump connection for hose	NW8/12
Bath volume	4 l
Dimensions (W x D x H)	225 x 360 x 380 mm
Power supply requirement	208 – 240 V / 50/60 Hz
Power input	0.77 kW
Fuse	16 A
Min. ambient temperature	5 °C
Max. ambient temperature	32 °C

KV 600 digital

KV 600 digital is an active condenser with air-conditioned refrigerator featuring a user-friendly microprocessor controller with large temperature display. The temperature consistency is 1 K. The heat rejection rate and flow rate of the KV 600 are customized to IKA® calorimeters C 1, C 6000, C 2000, C 5000 control pack 2, and C 7000.

Ident. No.	
3410500	230 V 50/60 Hz
3410501	115 V 50/60 Hz

Our accessories for the C 1 and C 6000 calorimeters can further enhance your specific research requirements and applications.

Ident. No.	Name	Description
3052500	Crucible holder (small)	Required for our small crucibles C 4 and C 5
4500600	C 1.50 Dot matrix printer	Small dot matrix printer; includes paper rolls and cartridge
4040500	C 6040 Calwin	See page 15 of this brochure for more detailed information
1605300	C 21 Pelleting press	Manual pellet press for powders; good combustible substances
0750200	C 29 Oxygen pressure regulator	To adjust the required oxygen pressure from the bottle to the calorimeter to 30 bar
3410500	KV 600 Cooling water supply (230 V)	Active condenser with air-conditioned refrigerator
3410501	KV 600 Cooling water supply (115 V)	Active condenser with air-conditioned refrigerator
4500800	C 1.35 Venting bottle	To vent the combustion gases in a bigger bottle with absorption solution for further analysis

Structured capabilities of connections on backside of the C1 and C 6000.

Ident. No.	Name	Description
4500700	C 1.1012 Organizer	For more comfortable handling of the decomposition vessels, we recommend one organizer per decomposition vessel. One is already included with the calorimeter package
4500900	C 1.30 Gas washing station	To vent the combustion gases in a controlled manner into an absorption solution for further analysis
4501000	C 1.20 Waterheater	To connect the C 1 to tap water
4500300	C 1.10 Combustion chamber	Standard combustion chamber, upper and lower part
4500400	C 1.12 Combustion chamber, halogen resistant	Combustion chamber upper and lower part recommended for halogen containing samples
4502200	C 1.101 Set of spare parts	Contains standard consumables, wearing parts for the C 1 calorimeter series and the combustion chamber C 1.10 for approximately 1000 experiments
4502300	C 1.121 Set of spare parts	Contains standard consumables, wearing parts for the C 1 calorimeter series and the decomposition vessel C 1.12 for approximately 1000 experiments

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To get customized and additional accessories, please visit
www.ika.com/service

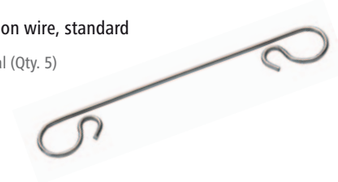
C 6000 Calorimeter | **Accessories**

Ident. No.	Name	Description
3770000	C 6010 Decomposition vessel, standard	Standard decomposition vessel
4504000	C 6012 Decomposition vessel, halogen resistant	Halogen resistant decomposition vessel. Includes catalysts for a higher recovery rate on halogens and sulphur
4504100	C 6030 Gas washing station	To vent the combustion gases in a controlled manner into an absorption solution for further analysis
4504200	C 60.1012	For more comfortable handling of the decomposition vessels, we recommend one organizer per decomposition vessel. One is already included with the calorimeter package
4504300	C 6000.10 Set of spare parts	Contains standard consumables, wearing parts for the C 6000 calorimeter series and the decomposition vessel C 6010 for approximately 1000 experiments
4504400	C 6000.12 Set of spare parts	Contains standard consumables, wearing parts of the calorimeters of C 6000 series and the decomposition vessel C 6012 for approximately 1000 experiments

Calorimeters | **Consumables**

C 1.103 Ignition wire, standard

Material: Kantal (Qty. 5)



Ident. No.
3976000

C 1.123 Ignition wire, platinum

Material: Platinum; These wires are recommended when your samples contain chlorine (Qty. 2)

Ident. No.
4520200

C 5003.1 Aqua Pro Stabilizing agent

Adjusts the conductivity of the water to achieve optimal performance of the calorimeter. Prevents growth of algae (Volume 40 ml)

Ident. No.
7207700

C 710.4 Cotton thread, cut to length

Qty. 500

Ident. No.
1483700

C 6 Quartz dish, large

Standard crucibles (Qty. 1)

Ident. No.
0355100

C 710.2 Set of VA combustion crucibles, large

Standard crucibles (Qty. 25)

Ident. No.
1483500

C 4 Quartz dish, small

Requires small crucible holder (Qty. 1)

Ident. No.
1695500

C 5 Set of VA combustion crucibles, small

Requires small crucible holder (Qty. 25)

Ident. No.
1749500

C 9 Gelatine capsules

Gelatine capsules are recommended in the ASTM D 240 for testing liquid hydrocarbon fuels. The capsule prevents splashing of the sample when igniting and supports the decomposition through their additional energy (Qty. 100)

Ident. No.
0749900

C 10 Acetobutyrate capsules (100 pieces)

The non-hygroscopic capsules are recommended for samples containing volatile components and are mainly used for solvents. In addition, the capsule prevents splashing of the sample when igniting and supports decomposition through their additional energy (Qty. 100)

Ident. No.
0750000

Calorimeters | **Consumables**

C 17 Paraffin, liquid

Volume 30 ml

Ident. No.
3801200

C 43 Benzoic acid, NIST 39i

High purity benzoic acid powder. Must be pressed into pellets before decomposition! Standard Reference Material with certificate from the "National Institute of Standards & Technology (NIST), USA" (Qty. 30 g)

Ident. No.
0750600

C 723 Benzoic acid, blister package

Pelleted and blister packaged IKA® standard benzoic acid tablets with IKA® - certified gross calorific value for the calibration of the calorimeter (Qty. 50 pieces each 0.5 g)

Ident. No.
3243000

C 723 Benzoic acid, blister package, large pack

Pelleted and blister packaged IKA® standard benzoic acid tablets with IKA® - certified gross calorific value for the calibration of the calorimeter (Qty. 450 pieces each 0.5 g)

Ident. No.
3717400

AOD 1.11 Control standard for sulphur and chlorine

Mineral oil with known sulphur- and chlorine content. Includes detailed work-instructions and a certificate. Recommended for the following: to check the handling, decomposition procedure and the respective peripheral detection devices (Volume 50 ml)

Ident. No.
3044000

AOD 1.12 Control standard for fluorine and bromine

Mineral oil with known bromine and fluorine content. Includes detailed work-instructions and a certificate. Recommended for the following: to check the handling, decomposition procedure and the respective peripheral detection devices (Volume 50 ml)

Ident. No.
3080200

C 12 Combustion bags, small

Polyethylene (PE) bags with already determined calorific value. For samples with a low calorific value, powdery and with low specific weight (Qty. 100, 40 x 35 mm)

Ident. No.
2201400

C 12A Combustion bags, large

Polyethylene (PE) bags with already determined calorific value. For use with the following samples: low calorific value, powders and low specific weight samples (Qty. 100, 70 x 35 mm)

Ident. No.
2201500

C 15 Parafilm strips

For flammable or water containing samples (Qty. 600)

Ident. No.
3131100

C 16 Parafilm

1000 x 500 mm

Ident. No.
3801100

Calorimeters | **Software**

Ident. No.
4040500 Price on request

System requirements

Windows XP (SP2), Windows Vista, Windows 7, Microsoft SQL Server and at least one free USB or RS 232 (9 pin Sub-D (M)) serial interface. Processor with min. 1.6 GHz (single core-Processor); 2 GB RAM; 2.5 GB free hard-disc space; DVD-ROM-drive

- Data management with Microsoft SQL Server
- Clearly arranged layout of all measurements, results, and connected calorimeters on one screen
- Printing and saving calibration protocols with control chart view

Modern Calorimetry requires modern Data handling…

Calwin C 6040 - PC control and evaluation software for the IKA® calorimeters.

The new IKA® calorimeter software Calwin C 6040 follows in the footsteps of our Calwin C 5040 with a vast array of modern solutions, ideas and possibilities for managing the measurements from our calorimeters. This software can be connected with the C 5000 (firmware 2.22), C 2000 (firmware 2.22), C 200 as well as the new calorimeters C 6000 global standards, C 6000 isoperibol and C 1.

- Library and grouping functions with extended data filtering options
- Correction calculations to obtain the net calorific value according to various ISO, ASTM, DIN, GB, GOST standards
- Data transfer to pre-configured work sheets for Excel (configurable by the user)

Industries & Applications

> Coal and Coke / Power Plants

Anthracite coal
Hard coal
Brown coal
Bituminous coal
Coke

> Petroleum

Jet fuel
Kerosene
Liquid fuels
Gasoline
Oil
Bio-fuels

> Cement

Coke
Tires
Animal flour
Mixed waste material

> Waste Management / Recycling

Tetra-pack
PVC powder
Printed circuit board
Lacquer
Waste solvent

> Food

Noodles
Dried fruit
Fish
Milk
Chocolate
Cheese

> Universities and Research Institutes

Teaching thermodynamics
Enthalpy studies
Airplane covering
Ecological studies

> Agriculture (Fodder)

Forage crops
Fodder for cats, dogs, cows, sheep, pigs, chicken
Animal urine and droppings

> Construction and Building Materials

Fleece
Insulation material
Styrofoam
Mortar
Rock wool

> Biomass

Wood
Wood pellets
Saw dust
Grass
Corn
Bio-fuels

Calorimeter standards

Calorimeter standards

GB/T 213 – 2008	Calorie testing method of coal
ASTM – D240	Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter
ASTM – D4809	Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter (precision method)
ASTM – D5865	Standard test method for gross calorific value of coal and coke
ASTM – D5468	Standard test method for gross calorific and ash value of waste materials
ASTM – E711	Standard test method for gross calorific value of refuse-derived fuel by bomb calorimeter
JIS M 8814	Coal and coke: determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value
ISO 1928	Solid mineral fuels Determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value
ISO 1716	Reaction to fire tests for building products
DIN EN ISO 9831	Animal feeding stuffs; animal products - feces or urine determination of gross calorific value
DIN EN 14582:2007	Characterization of waste - halogen and sulfur content oxygen combustion in closed systems and determination methods
DIN 51900 – 1	Testing of solid and liquid fuels - determination of gross calorific value by the bomb calorimeter and calculation of net calorific value Part 1: Principles, apparatus, methods
DIN 51900 – 2	Method using isoperibolic or static jacket calorimeter
DIN 51900 – 3	Method using adiabatic jacket

IKA®+

Sample Analysis!

Send us your sample and we will process and analyze it for you within 48 hours!

Send your sample with a data sheet to:
IKA®-Werke GmbH & Co. KG,
Janke & Kunkel-Str. 10,
79219 Staufen, Germany.

Data sheet download:
www.ika.com/application

Calorimeter basics and brief history

A bomb calorimeter is used to measure the heat created by a sample burned under an oxygen rich atmosphere in a closed vessel, which is surrounded by water, under controlled conditions. The measurement result is called the combustion, calorific or BTU-value. The result allows one to make certain decisions regarding the quality, physiological, physical and chemical, as well as financial conclusions about the product.

The term “calorimeter” was first mentioned by Josef Black in 1770. One of the first calorimeters (ice-calorimeter / phase transition calorimeter) was developed by Lavoisier and Laplace around 1780. The calorimetric bomb is also called “Berthelotsche Bomb”. Marcellin Berthelot developed the combustion of samples in a closed pressure resisting vessel into a standard method. He was the first to use pure oxygen at higher pressures to get a faster and more complete combustion (1885). In 1892, the first patent for a calorimeter to measure the heating value of gaseous fuel was given to Hugo Junkers, a German inventor and aircraft engineer. IKA® introduced their first bomb calorimeter in the 1920‘s. Since then our calorimeters have been continuously developed according to the latest standards and technologies.

There are many different types of calorimeters available on the market: Solution, DSC - Differential Scanning, Titration, Gas and Reaction Calorimeters.

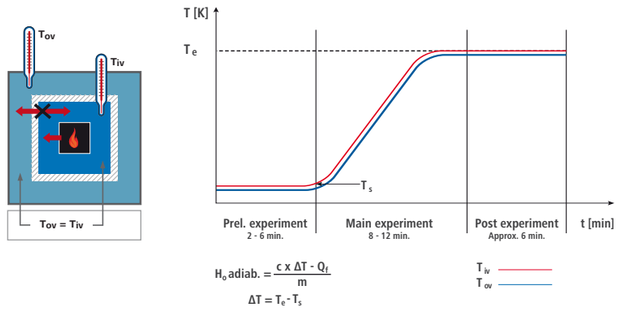
IKA® manufactures so called bomb - or combustion calorimeters.

About 1 g of solid or liquid matter is weighed into a crucible and placed inside a stainless steel container. The decomposition vessel or bomb is filled with 30 bar of oxygen (quality 3.5: technical oxygen 99.95 %). The sample is ignited for example through a cotton thread connected to a solid ignition wire inside the decomposition vessel and burned. During the combustion the core temperature in the crucible can reach 1000 °C, and the pressure rises as well. All organic matter is burned and oxidized under these conditions.

The heat created during the burning process can be determined using the isoperibol, adiabatic or dynamic measurement procedure.

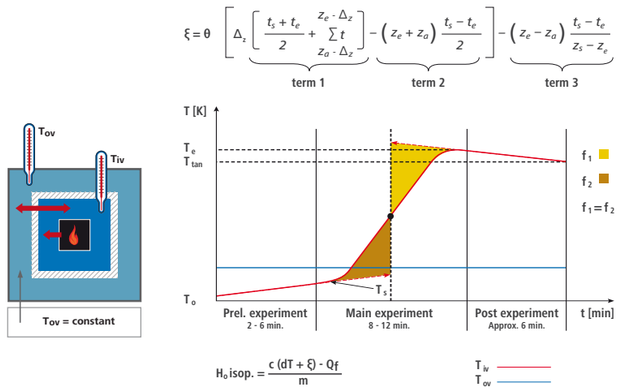
Adiabatic calorimeter

In an adiabatic calorimeter, the temperature in the outer vessel (T_{ov}) is equal to the temperature of the inner vessel (T_{iv}) throughout the experiment. This is as close to a “perfect isolation” as possible. The influence of the environment has to be minimized using air-conditioning to keep the room temperature as constant as possible. No correction calculations need to be done when compared with the isoperibolic calorimater.



Isoperibol calorimeter

In an isoperibol calorimeter the temperature in the outer vessel (T_{ov}), is kept constant throughout the experiment. This does not allow a “perfect isolation”. There are still small temperature fluctuations. The influence of the environment has to be minimized by using air-conditioning to keep the room temperature as constant as possible. A correction factor (Regnault-Pfaundler = ξ) will be calculated after the experiment that takes these temperature fluctuations into account.



Dynamic calorimeter

The dynamic IKA® designed modes are basically short versions of the original adiabatic and/or isoperibolic measuring modes. The measurement results still conform to the required Relative Standard Deviation (RSD) of the official standards.

Which calorimeter is most suitable for my application and requirements?
The main questions that should be answered are as follows:
1. How many experiments do you plan on conducting in a day?
2. Are there any standards that have to be followed, such as ISO, ASTM, DIN, GB, GOST etc.?
3. Do samples contain halogens and sulphur and in which concentration approximately?
4. Is it required to analyze the halogens and sulphur content after the calorimeter experiment has concluded?
5. Do you prefer any of the following methods: adiabatic, isoperibol, static jacket isoperibol, dry or dynamic?

How do I know my calorimeter is still in calibration?
Most customers operate their calorimeters with control charts. After calibrating the unit, check runs are performed with benzoic acid, for instance. The results of these check runs have to match the certified calorific value of the benzoic acid within a defined range. The definition of the range is laid out in standards and the frequency of doing these checks differs from 1 to 2 a day, to 1 after and before every sample. The control charts show the performance of the unit under the previously described circumstance over a long period of time.

How often do I have to calibrate the calorimeter?
The control chart also shows when a new calibration might be required.

Which is the max and min calorific value that I can measure with the calorimeter?
The max. allowed energy input into our calorimeters is 40,000 J. The calorific value of a sample is always expressed in energy per weight (J/g). Based on that information, you can adjust the weight of your sample such that it does not exceed 40,000 J. The energy amount created by the sample should not be significantly higher than the one obtained during calibration with benzoic acid. Our calorimeters do have a high measuring sensitivity and can detect low quantities of energy. For example, the ignition energy of 70 J can be measured with an absolute error of +/- 20 J. The relative error rises naturally (+/- 30%) hyperbolically the smaller the energy input is. If your sample has a very low calorific value you can also use combustion aids, since they add energy to the calorimeter to minimize the error.

When do I have to send the decomposition vessel to the high pressure inspection at IKA®?
We recommend checking the vessel after 1000 experiments or after 1 year of operation, whichever comes first. During the overall inspection process we perform both a high pressure and an operating pressure test. A new certificate will be issued for the vessel after it has passed both of these tests. More detailed information can be found in the manual of your calorimeter and/or the manual of your decomposition vessel. Alternatively, you can always contact our service department for further information and assistance.

Where do I find a list of spare parts and how many of these do I need?
We offer sets of spare parts that include parts for 1000 experiments e.g. 1 year operation. The actual amount of spare parts can vary based on the application. If a specific spare part is required, you can find further information in the service section of the instruction manual. In addition, on our website (www.ika.com) in the service section you can download service drawings with detailed descriptions of each part. Alternatively, you can always contact our service department for further information and assistance.

How can I get the gross and net calorific value - easily explained?
A calorimeter measures the preliminary gross calorific value of the sample. To get the gross calorific value, correction calculations are required for the acids formed during the combustion. For instance, the method of titration used to obtain the amount of nitric acid and sulphuric acid are described in detail in the standard ISO 1928. To get to the net calorific value, further corrections need to be applied concerning the amount of water that was formed during the combustion from hydrogen. Based on in the state (dry, analytical moisture, as received…) your sample was in before combustion, further corrections may apply. Moistures are determined by drying the samples. The Hydrogen content is usually measured with an elemental analyzer. For a more detailed explanation, we ask you study the standards you might have to use depending on your application requirements.

IKA®+

Application Support!

For questions regarding applications and processes, you can call our hotline number:
00 8000 4522777 (00 8000 IKAAPPS)*
E-Mail: applicationsupport@ika.de

* Monday – Thursday from 8:30 - 16:30
Friday from 8:30 - 15:30

Prices valid until 31st of December 2013
All prices exclusive to VAT
Subject to alteration of prices

IKA®+

Ordering made easy!

For more information about our products and to place your order, please visit:

www.ika.com

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IKA®-Werke GmbH & Co. KG
Janke & Kunkel-Str. 10
79219 Staufen
Germany

Tel. +49 7633 831-0
Fax +49 7633 831-98

sales@ika.de
www.ika.com

IKA® **German** technology