



DDS CALORIMETERS

Scientific Analytical Calorimeter Solutions



CAL3K BAYONET VESSELS

Oxygen Bomb Vessels

MANUFACTURING SUPERB CALORIMETERS FOR TODAY'S ANALYTICAL NEEDS

www.ddscalorimeters.com

CAL3K BAYONET VESSELS

The traditional CAL2K-4 bomb vessel has been replaced with a self-locking and sealing bayonet vessel with built-in temperature sensors. The vessel is completely removable for easy sample management, cooling, cleaning and maintenance.

The CAL3K bayonet (self-locking and sealing) vessel has a stainless steel body with a reduced mass (approx. 1.9kg) and a pressed on aluminium sleeve which acts as a heat sink and temperature equalizer. This sleeve performs the task of the traditional water and stirrer.

The oxygen bomb calorimeter and bomb vessel are operated together for effective routine sample determination- for optimal results and faster throughput use 2 or more vessels.

NEW Bayonet “claws” to keep the vessel lid locked.
Topped with a low heat conducting plastic handle for handling warm bomb vessels.

BAYONET VESSELS FOR USE WITH ALL CAL3K SYSTEMS

The sensors are embedded in the vessel walls. The electronics are located in the bottom of the vessel and are vacuum encapsulated to prevent any liquid or dust from entering. The lid has three bayonet claws, and is topped with a low heat conducting plastic handle, which allows handling of warm vessels easier.

The bayonet lock is the first change you will notice in the CAL3K vessel. It is designed to leak if not engaged more than 50%. It is smaller and lighter compared to the CAL2K Vessel, so it will use less oxygen and have a 10 degree temperature rise for 1/2 gram of Benzoic Acid.

The temperature sensors are absolutely linear. This is a major advantage as the vessel can be fired at any temperature and remain perfectly calibrated.

AUTOMATIC & MANUAL FILLING OXYGEN BAYONET VESSELS



COMPATIBILITY

The manual oxygen filling bayonet bomb vessel is used together with the manual oxygen filling station and is compatible with the following calorimeter systems from DDS Calorimeters :

- CAL3K-A Oxygen Bomb Calorimeter
- CAL3K-U Oxygen Bomb Calorimeter
- CAL3K-F Oxygen Bomb Calorimeter

The automatic oxygen filling bayonet bomb vessel does not require the manual oxygen filling station and is filled automatically inside the calorimeter system. It is compatible with the following calorimeter systems from DDS Calorimeters :

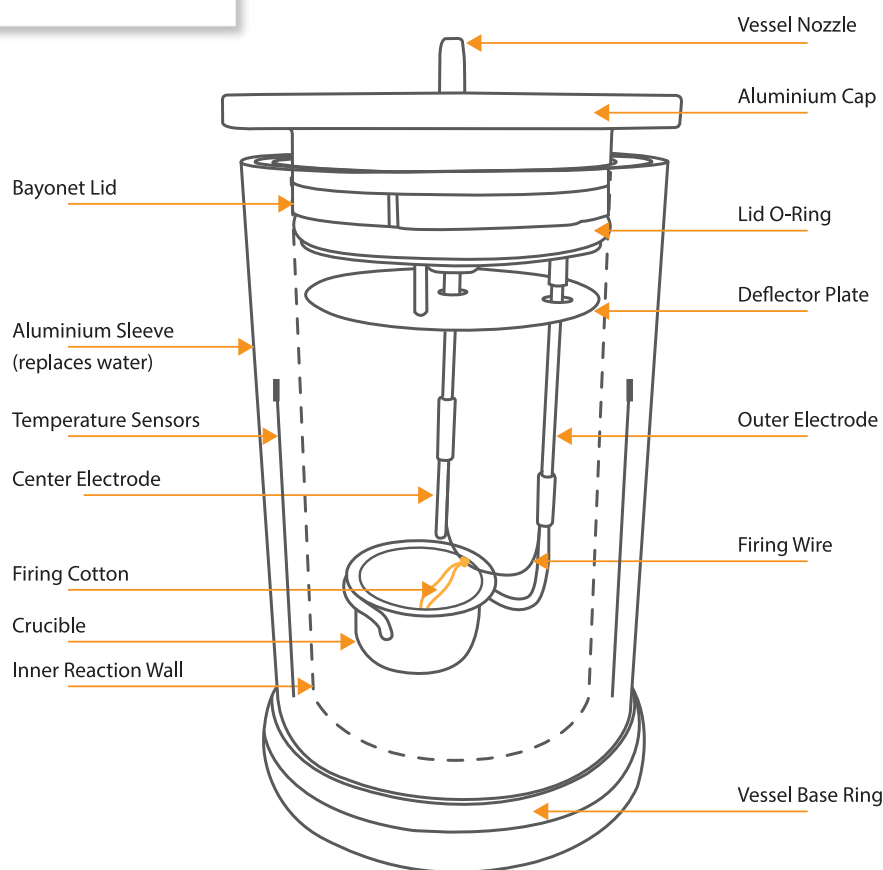
- CAL3K-AP Oxygen Bomb Calorimeter

CAL³K
NEXT GENERATION CALORIMETERS

CAL3K BAYONET VESSELS

The other almost expected advantage is the improved temperature resolution. These new temperature sensors are stable at a working resolution of 0.000001°C parts per million. To put this into some kind of perspective, that's about 40 times better than the CAL2K vessel. The next addition to the Bayonet Vessel is a new "brain". It uses ultra low power, which is in the region of three times less than the CAL2K vessel, which results in ultra low heating. The new technology in the brain allowed us to harvest the temperature readings with such stability that it is possible to sense a human standing 1 meter away from the vessel

So what does all this mean? We can now get a possible result of 0.00005MJ certainty.



CAL3K BOMB VESSEL BREAKDOWN

BAYONET VESSEL OVERVIEW

Of course, this is not the accuracy you can expect on the final results, which is subject to moisture, sample preparation, sample consistency, weighing and operator procedure. Basically, the CAL3K can produce extremely accurate results, but is limited by your laboratory.

The next obvious change is the black LID. It is a special black plastic which will allow you to pick up the vessel when it is around 50°C . 50°C is just a little warm to handle, but the vessel can operate beyond this temperature. The linear sensors give the ability to have perfectly predictable linear calibration, so this means if your lab room temperature is at 20°C then you can fire the vessel three times with Benzoic Acid Tablets before it needs to be cooled. Each Benzoic Acid firing will increase the vessel temperature by about 10°C .

Vessel testing happens every time it is inserted into the bomb well. The results are stored and reported back to the calorimeter. Each vessel has its own statistics, from o-ring count, firing wire change, miss fires, maximum temperatures and the test results.

CAL3K BAYONET VESSELS

Another great benefit will be the machine assembled vessel control card (the “brain”). Improved quality and reliability. The vessel electronics are now tested three times in the factory- after assembly, then after 24 hours oven burn-in, and then finally after packaging. All the times are recorded in the vessel memory together with such information as : Manufacturer, Dealer/Agent, Customer, Assigned Serial Number.

BOMB VESSEL FEATURES

Feature	Description
Reduced Thermal Mass	Thermal mass reduced by approx. 50% gives more resolution and is easier to handle.
Bayonet Lid	Bayonet lid for fast opening and closing
Improved Resolution	Greatly improved temperature resolution of 1ppm gives improved accuracy.
Reduced Interference	Greatly reduces noise interference of <10ppm gives very stable results.
Improved Self-Testing	Improved factory, field and self testing
Operational History	Vessel operation history available
Calibration History	It holds the history of up to 70 calibrations
Linear Temperature Sensing	Very linear temperature sensing allows two determination without cooling
Improved Parameters	Improved setup parameters and temperature calibration
Calibration Fields	7 Calibration Fields
Average Calibrations	Maximum of 10 calibrations per field
Temperature Recording	Maximum Temperature Recording
Limit Settings	Inspection warning and limit settings
Inspection Records	Inspection Records
Safety Feature	Vessel will not fill with oxygen if bayonet lid is not properly sealed

CONTACT US

COMPANY HISTORY

Digital Data Systems (DDS has more than 40 years of experience in calorimetry.

In 1972, DDS produced their first calorimeter, the AMPC (Automatic Micro Processor Calorimeter). The AMPC was a dual water isothermal unit controlled by a microprocessor.

In 1980 work began on a new revolutionary design of vessel, namely the DRY vessel or CP510, which meant that there was no surrounding water jacket. A copper sleeve pressed over the vessel replaced the water jacket and the temperature sensors were placed inside the vessel resulting in the heat transfer being extremely fast. Determination time was significantly reduced, increasing the unit efficiency by 4 times. With the processing power of the microprocessors available at the time, the CP500 Calorimeter was born. The striking "buttercup yellow" colour gave a splash of brightness to the then drab laboratories.

In 2002 work began on the CAL2K. The tried and tested DRY system was retained and only the very latest electronic technology was used, including the surface mount devices.

In 2005, DDS came to realize the need for smaller, low volume, inexpensive calorimeter systems, with the same accuracy and reliability of the CAL2K. The ECO was then created as an alternative system to the CAL2K. The ECO is suitable for the following markets: Universities, Research Facilities, Brick Manufacturers, Animal Feed Industries, Food Quality, and Food Production.

In 2007 the new E2K system was developed. Should you require more information on our superb range of bomb calorimeters please contact your nearest dealer or visit our website.

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**DDS Calorimeters are proudly manufactured by :
Digital Data Systems (Pty) Ltd.**

For more information about any of our products visit our website at www.ddscalorimeters.com.

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