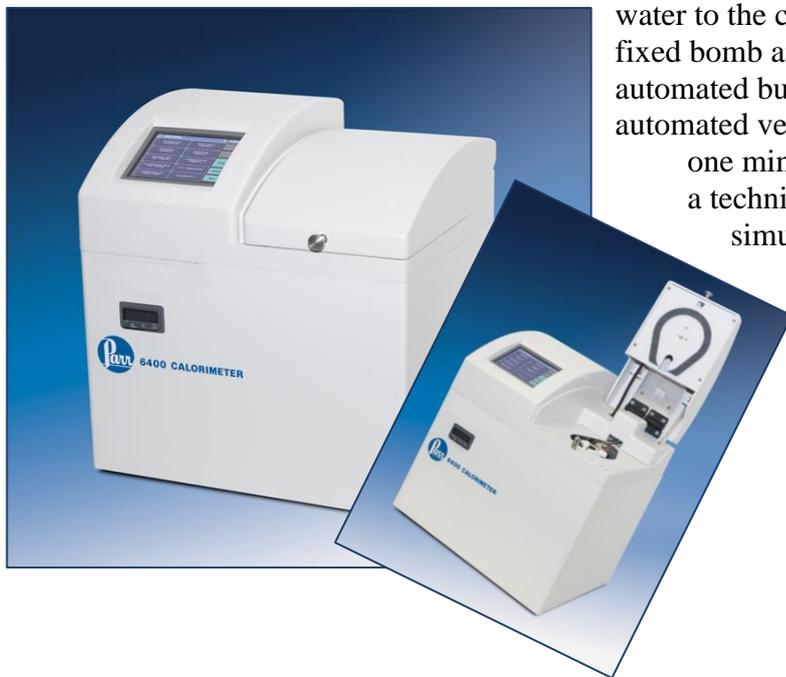


The 6400 Automatic Isoperibol Calorimeter represents the next evolutionary step in the Parr automated calorimeters. Inclusive and compact, the instrument incorporates a closed loop cooling subsystem into the calorimeter. This subsystem uses a thermoelectric cooler assembly attached directly to a one liter water tank which supplies cooling water to the calorimeter. An external nitrogen pressurized tank is used to supply rinse

water to the calorimeter. This model features the fixed bomb and bucket design allowing for automated bucket and jacket fill as well as automated vessel fill and rinse. The 6400 requires one minute of operator time per test, allowing a technician to operate up to four calorimeters simultaneously.



Design Features

Parr Fixed Bomb and Bucket Technology

The 6400 Automatic Isoperibol Calorimeter uses a fixed bomb and bucket design where the bomb and bucket are not removed from the calorimeter during routine operations. This design concept has made it possible to offer unique levels of automation for the entire calorimetric determination not just the data collection and reporting steps. The result of this automation will save approximately five minutes of operator time per test when compared to any removable bomb calorimeter.

Oxygen Charging and Release

The fixed bomb and bucket design allow the oxygen supply to be directed into the head of the bomb at the beginning of each test. The head of these bombs incorporate a check valve which dynamically seals when the bomb is pressurized. At the end of the test, the gases in the bomb are automatically released while the calorimeter is being returned to its starting temperature.

Fixed Bucket

The bucket in these calorimeters has been designed to provide smooth circulation over the surface of the vessel. The design also repeatedly fills the bucket volumetrically. The bomb head closure seals the bucket at the same time the bomb is closed. This unique design minimizes the amount of water required for the test as well as permitting rapid, automatic and repeatable filling for each test. The water heated by the combustion is automatically drained from the bucket at the conclusion of the test and replaced with cooling water to bring the bomb and bucket rapidly back down to the starting temperature for the next test.

Fixed Bomb

The 6400 Calorimeter features the patented closure design of the Parr Fixed bombs. This design allows the user to seal and lock the head into the cylinder with simple one sixteenth turn. The main bomb seal is an o-ring optimized to minimize frictional wear, improving the lifetime of this seal. At the conclusion of the test the inside surface of the bomb is washed to remove the products of the combustion from the bomb. The automation of the bomb washing step eliminates one of the most tedious and time consuming manual operations required with removable bomb calorimeters. Besides the elimination of the drudgery of manually washing the bomb, a not so obvious advantage of the fixed bomb design is that the bomb is always washed as soon as the final temperature can be determined. Generally, this is within 4-5 minutes of the time the bomb is fired. This holds to an absolute minimum the time any acids produced by the combustion can attach to the inner surfaces of the bomb. This has improved the service life of these bombs in comparison to removable bombs.

1138 Oxygen Combustion Bomb

The 1138 oxygen bomb is the standard bomb in the 6400 calorimeter. The 1138 Oxygen Bomb has been redesigned to withstand a higher magnitude of tests. The head is designed with an O-ring groove which is optimized to minimize frictional wear, in turn improving the lifetime of the seal. The bomb head is removable for fast sample loading using the patented Quick Twist-Lock vessel closure design.

The bomb is made from alloy 20; a special niobium stabilized stainless steel selected for its resistance to the mixed nitric and sulfuric acids produced during the combustion process. The 1138CL is made from the halogen resistant Hastelloy G30™. Hastelloy 30™ is an alloy rich in cobalt and molybdenum and is able to resist the corrosive effects of free chlorine and halogen acids produced when burning samples with significant chlorine content. While no alloy will completely resist the corrosive atmospheres produced when burning samples containing halogen compounds, users who intend to test these materials are urged to select the 1138CL Bomb.

These bombs are 250 mL in volume and are rated to a working pressure of 2000 psi. The bombs are hydrostatically tested to 3000 psi and the sample range is ~1g or 5000 – 8000 calories.

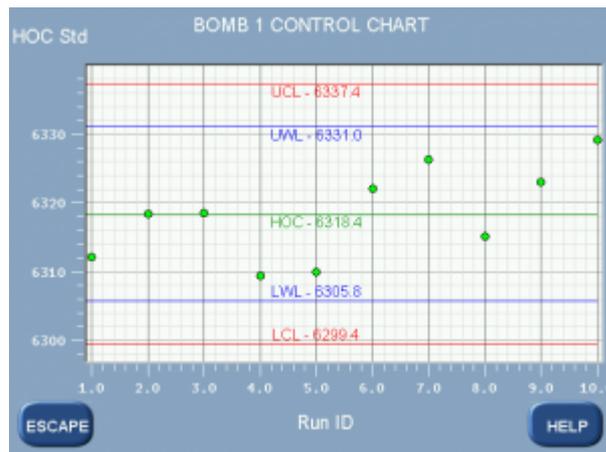
A1450DD Head

Users who wish to achieve maximum through-put with their 6400 calorimeters will want to purchase a spare A1450DD head for their calorimeter. This permits the next sample to be completely prepared and inserted into the bomb as soon as the current test is concluded.



Control Charts

A control chart is a graphical tool which can assist the user in determining whether or not their process is in control. Many standard methods will dictate that a reference sample be measured periodically and the results plotted on a graph. Limits for acceptable values are defined and the process is assumed to be in control as long as the results stay within these limits. Since results are expected to scatter with a normal distribution within established limits, systematic trends or patterns in the data plots may also be an early warning of problems. The 6400 calorimeter provides the user with the ability to instantaneously plot and view standard results with user defined warning and control limits.



Laboratory Requirements

The calorimeter requires a source of 99.5% oxygen, a source of nitrogen or house air at 80 psi, and deionized water.

Parr 6400 Calorimeter Specifications

Model Number:

6400

Tests per Hour:

6 – 7

Operator Time per Test:

1 Minute

Precision Classification:

0.1% Class

Jacket Type:

Isoperibol, Water Jacket

Oxygen Fill:

Automatic

Bucket Fill:

Automatic

Bomb Wash:

Automatic

Bomb Model Options:

1138, 250mL Alloy 20

1138CL, 250mL Alloy G30

Balance Communication:

USB Port

Printer Communication:

USB Port

Network Connection:

TCP/IP via Ethernet

Dimensions (cm):

42w x 46d x 51h