



# Series 1341 Plain Oxygen Bomb Calorimeters

**Designing  
and Building  
High Precision  
Bomb  
Calorimeters  
for Over  
100 Years**



# 1341

# Series 1341 Plain Oxygen Bomb Calorimeters



1341 Calorimeter with 6775 Digital Thermometer & 2901 Ignition Unit

## Bomb Calorimetry

A fundamental test of great significance to anyone concerned with the production or utilization of solid or liquid fuels.

One of the most important tests in the evaluation of materials which are burned as fuels is the determination of the heat of combustion, or calorific value. These measurements can be made quickly and accurately in Parr oxygen bomb calorimeters, utilizing either the latest in automatic calorimetric equipment or in simple calorimeters in which all elements have been reduced to their fundamental forms. Uses for these calorimeters extend into any chemical, physical, or physiological process in which heat generation or burning is an important factor. Principal applications include calorific measurements for:

- Coal and coke, all varieties and types
- Fuel oil, both heavy and light varieties
- Gasoline, all motor fuel and aviation types

- Jet fuels, all varieties
- Combustible wastes and refuse disposal
- Foodstuffs and supplements for human nutrition
- Forage crops and supplements for animal nutrition
- Building materials
- Explosives and heat powders
- Rocket fuels and related propellants
- Thermodynamic studies of combustible materials
- Energy balance studies in ecology

## Ideal for Laboratory Instruction

The 1341 is ideal for teaching the fundamentals of calorimetry.

Using the Parr 6775 Digital Thermometer included with the 1341, temperature points are manually recorded and plotted. Students perform the calculations to determine the energy released from the sample.

With the addition of the optional Parr 6772 Calorimetric Thermometer students or faculty can automate the

temperature acquisition and calculations in cases where manual calculations are not desirable.

## For occasional calorific tests

The 1341 Calorimeter is an improved version of a plain, static jacket calorimeter that has been made by Parr for nearly 100 years. It is a reliable calorimeter that can be used for a full range of solid and liquid samples, but it is recommended primarily for users who make only an occasional calorific test, or whose work load does not justify the purchase of an automatic model. Its modest cost and simple design make it well suited for intermittent use. The calorimeter requires no permanent connections. It can be set-up and ready to operate in a few minutes, and, when not in use, it is easily disassembled and stored on a shelf.

## Many Applications

The 1341 Calorimeter can be used to determine the calorific value of coal, oil, foodstuffs and any other materials which can be burned safely

in an oxygen bomb. Calorific tests for coal and solid fuels are made in accordance with ASTM Standard Test Method D5865, "Standard Test Method for Gross Calorific Value of Coal and Coke." The 1341 Calorimeter is also an excellent instrument for teaching calorimetry and heat measurement techniques in a student laboratory since it provides all of the instrumentation needed for such tests, but with each element in the system reduced to fundamental forms.

Although commonly called a "plain" calorimeter because of its simple design, technically this is a static jacket instrument which operates at or near room temperature with no provision for temperature adjustment or control. Compensation for any heat loss (or gain) during a test is made by applying a correction computed from heat leak measurements taken immediately before and after each test. Because of the additional time required for these measurements, the speed with which a test can be performed in this calorimeter is slower than in a microprocessor controlled, automatic model. Ten or twelve tests can be completed in an eight hour day, whereas approximately five times this number can be run in the same period using a Parr Automatic Calorimeter.

### Good Repeatability

Good repeatability can be obtained with the 1341 Calorimeter provided that the temperature rise and the heat leak correction are measured and applied carefully. When operated with the standard 6775 Digital Thermometer supplied with the instrument, standard

deviations in a series of tests with a uniform sample, such as benzoic acid, should not exceed 0.3%. This repeatability can be improved by using a Parr 6772 Calorimetric Thermometer. Users requiring better precision should consider one of the other Parr calorimeters. Values obtained when testing a non-homogeneous material, such as coal, may show a wider spread than when testing a uniform material.

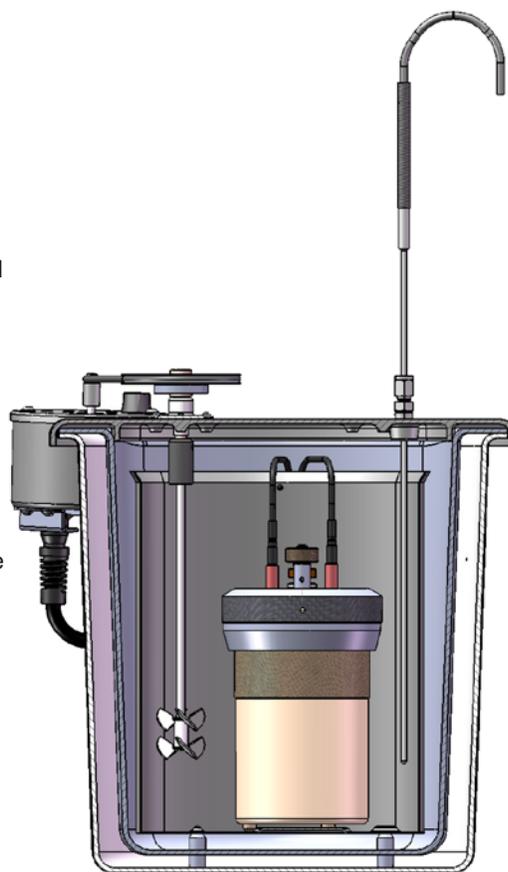
### An Effective Thermal Jacket

The 1341 Calorimeter has a high strength, molded fiberglass jacket formed with double walls and a double cover to provide an oval chamber for the calorimeter bucket which is completely surrounded by sealed, dead air space. This simple yet effective insulating system allows very little heat transfer between the calorimeter and its surroundings. A stirring shaft and thermister are attached to the cover and are removed with the cover when the calorimeter is opened. Stirring is provided by a small motor attached to the jacket but sufficiently removed so that it does not add heat to the system. A pair of wires with banana plugs carry the firing circuit to terminals on the bomb head. Outside dimensions of the cylindrical jacket are 10-7/8" dia. X 10-3/4" high.

### Calorimetric Thermometers

Each 1341 Calorimeter is equipped with a Parr 6775 Digital Thermometer. Parr test certificates are furnished for each thermometer.

For easier measurements and automatic calculation of results, Parr offers the 6772 Calorimetric Thermometer.



1341 Calorimeter Cross Section

### Ignition Unit

The only additional accessory needed for the 1341 Calorimeter is a Parr 2901 Ignition Unit which supplies the proper electric current for firing the oxygen bomb. This unit must be listed specifically when ordering a 1341 Calorimeter since it is priced separately and is not included as part of the calorimeter. The 2901 unit operates from a 115 volt line and has a push switch, indicator light and output terminals on its top panel. Ignition units for 230 volt operation are available also.

## 1341 Ordering Guide

### 1341 Plain Calorimeter

Model No.	Voltage	Description
1341EB	115V 50/60 Hz	Bomb Calorimeter with 1108 Oxygen Bomb
1341EE	230V 50/60 Hz	Bomb Calorimeter with 1108 Oxygen Bomb
2901EB	115V 50/60 Hz	Ignition Unit
2901EE	230V 50/60 Hz	Ignition Unit
1349B	NA	Spare Parts Kit for 1341 Calorimeter

## The Parr Warranty

**P**arr Instrument Company (Parr) combustion bombs, calorimeters, and associated products are designed and manufactured only for use by or under the direct supervision of trained professionals in accordance with specifications and instructions for use supplied with the products. For that reason, Parr sells only to professional users or through distributors to such users. Parr produces precision equipment and associated products which are not intended for general commercial use.

### **Exclusive Warranty**

To the extent allowed by law, the express and limited warranties herein are the sole warranties. Any implied warranties are expressly excluded, including but not limited to implied warranties of merchantability or fitness for a particular purpose.

### **Express Warranties**

Subject to the above Conditions, Parr expressly warrants that its products: Are as described in the applicable Parr sales literature, or as specified in Parr shipping documents. Will function as described in corresponding Parr sales bulletins, or for specifically engineered assemblies, as stated in the sales proposal and purchase agreement. Will remain free from defects in materials and workmanship for one year from date of delivery of the product to the original purchaser/user. Note that there is no guarantee of a service life of one year after delivery.

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