



Parr Instrument Company

Bulletin 2811

# Model 2811 Pellet Press

**The convenient and inexpensive way to make pellets, tablets, and wafers for oxygen bomb calorimetry, emission spectroscopy, molecular weight determinations, animal feed experiments, and other laboratory purposes.**



# 2811

**Designing and Building High Precision Combustion Calorimeters for 120 Years**

# Model 2811 Pellet Press



The Parr 2811 Pellet Press provides a convenient means for compressing powdered materials into pellet or tablet form without a heavy investment in expensive tablet-making machinery. It is a compact, hand-operated press that can be used anywhere in the laboratory, requiring very little bench space and no fixed mounting, producing uniform pellets in a polished stainless steel die and ejecting them smoothly into a stainless receiver without danger of contamination.

## **For Bomb Calorimetry**

Pellet making is a very important step in bomb calorimetry, particularly when working with finely powdered samples. Although some powdered materials burn well in an oxygen bomb, others, such as benzoic acid, must be pelletized for safe combustion and best results. There are several advantages to be gained by burning samples in pellet form instead of a loose powder.

## **Restricted burning rates.**

Some materials have dangerously high burning rates if burned as a loose powder. These rates can be restricted to safe levels by compressing the powder into a pellet or briquette.

## **Complete combustion**

Loose powders exposed to the turbulent gases produced during a bomb combustion may be blown out of the sample cup and extinguished by the cold bomb wall before they have burned completely. A pelletized sample will be held in the combustion zone with a much better chance for complete combustion.

## **Ease of handling**

Pelletized samples are easy to handle and weigh; they lie flat in the combustion capsule and ignite easily.

## **For Other Test Procedures**

Pelletized samples are equally important in other investigative and test procedures. Laboratories engaged in pharmaceutical, biological, nutrition and spectrographic operations find frequent uses for tablets and wafers of the types that can be made in a Parr press. Spectroscopists find this device excellent for preparing samples to be analyzed in an emission spectrometer. Small diameter pellets made in a Parr pellet press can be imbedded in a hole drilled in the sparking electrode, assuring the operator that his sample will always be held in exactly the right position for best results.

## **Six Pellet Sizes**

The pellets produced in the Parr press are cylindrical in shape with flat ends. Their height or thickness depends upon the amount of material compressed and the force applied. Six different punch and die sets are available for making pellets in diameters from 3 mm up to a maximum of 1/2 inch. All of these punch and die sets operate in the same basic press. The dies are not fastened down. They automatically align with the punch and may be slipped out from under the punch for quick reloading.

## **Pressure and Density Adjustments**

The compressive force in this press is developed by hand pressure on a lever attached to a large steel cam. This system is designed to provide a steadily increasing mechanical advantage up to a ratio of approximately 50 to 1 at the end of the stroke.

Thus, a force of 20 pounds applied to the lever develops approximately 1000 pounds on the punch, which is adequate to produce firm pellets from most powdered materials, usually without adding a binder.

The anvil which supports the die in the Parr press is attached to a heavy screw post so that it can be raised or lowered. Rotating the anvil to raise or lower the die makes it possible to produce pellets of any desired thickness using the maximum force of the press. When compressing light or fluffy materials the die can be raised after successive punch strokes to compensate for the reduction in the volume of the charge. The variable anvil setting can also be used as a means for adjusting the amount of pressure applied to a pellet. If duplicate pellets of equal density are desired, these can be made by using equal amounts of sample and leaving the anvil at a fixed setting while taking the punch through its full stroke when forming each pellet.

### Construction Features

The Parr pellet press is sturdily constructed with its parts arranged so that they can be easily cleaned and maintained in good working order. Punches, dies and die plugs in 1/4, 3/8 and 1/2 inch sizes are made of polished T-303 stainless steel. Any of these individual parts can be replaced if they become worn or damaged, but for the best performance it is recommended that they be purchased and used in sets. Dies in 1/4 inch and smaller are made of Nitronic 60 material. Punches in 1/4 inch and smaller sizes are made of 17-4 Stainless Steel. Punches are heat treated for added strength and hardness, and then polished to remove the dark oxide layer formed when treated.

Punch and die sets 1/4 inch and smaller are constructed with a 130° angle for ease of loading materials in these small punch and dies.

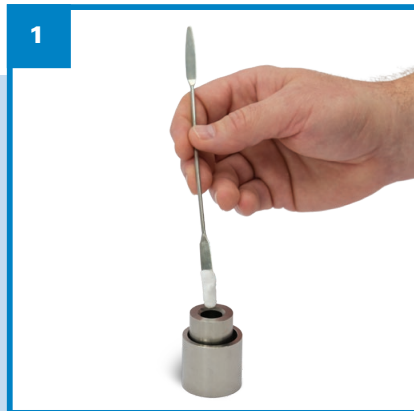
## Pellet Making With A Parr Pellet Press

### In four easy steps:

#### 1. Fill the die

Set the die and its holder on the base of the press with the beveled edge of the die resting on the flat surface in the reversible holder. Pour the charge into the die cavity and tamp with a stirring rod, if necessary.

1



#### 2. Compress the charge

Transfer the die and its holder to the press and push the lever down to compress the charge. To obtain maximum compression, the lever should require a firm push as it moves through its full stroke. If a full stroke is not obtained, turn the anvil to lower the die until the full mechanical advantage of the press can be utilized. Conversely, if the lever moves through its full stroke without encountering sufficient resistance, raise the die until firm compression can be applied.

2



#### 3. Reverse the die holder

Raise the lever and slide the die and its holder out of the press. Reverse the holder to bring the deep cavity under the die and return the parts to their original position. The clearance under the punch will be limited when making thin pellets. In such cases it will be more convenient to grasp the die with one hand and slide it upward on the punch, holding it in that position while reversing the die holder with the other hand.

3



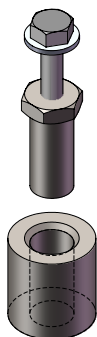
#### 4. Eject the pellet

Bring the lever down gently to eject the pellet into the cavity in the holder. If a thick pellet is not ejected by this stroke, turn the anvil to raise the die. The pellet will then drop out freely. Remove the pellet with tweezers or forceps; reverse the holder and repeat the cycle if additional pellets are required.

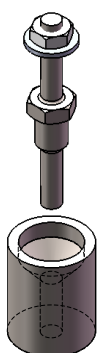
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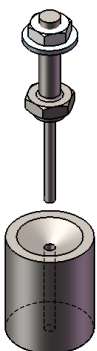
# Model 2811 Pellet Press



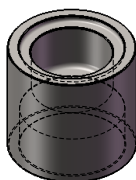
**A51PR & A51PR3**  
Punch & Die Sets  
1/2 in. and 3/8 in.



**A51PR8 - A51PR11**  
(82 degree taper)  
Punch and Die Sets  
1/4 in., 1/8 in.,  
3 mm, and 4.5 mm



**A51PR12 - A51PR15**  
(130 degree taper)  
Punch and Die Sets  
1/4 in., 1/8 in.,  
3 mm, and 4.5 mm



**40PR2**  
Die Holder

## 2811 Dimensions & Weights

Length of lever arm	7 in.
Maximum punch stroke	1.25 in.
Depth of cavity in:	
.50 and .375 inch dies	1 in.
.25, .125, and metric dies	0.75 in.
Dimensions of press base	5 x 9 in.
Overall press height	10 in.
Weight of assembled press	17 lb.
Gross shipping weight	20 lb.

## 2811 Ordering Guide

Model No.	Size of Punch & Die Set
2810 Pellet Press	None
2811 Pellet Press	0.50 in.
2813 Pellet Press	0.375 in.
2817 Pellet Press	0.25 in.
2818 Pellet Press	0.125 in.
2819 Pellet Press	3.0 mm
2820 Pellet Press	4.5 mm

## Extra Punch and Die Sets\*

Model No.	Size of Punch & Die Set
A51PR	0.50 in. diameter
A51PR3	0.375 in. diameter
A51PR12	0.25 in. diameter, 130°
A51PR13	0.125 in. diameter, 130°
A51PR14	3 mm diameter, 130°
A51PR15	4.5 mm diameter, 130°

## Pellet Press Replacement Parts

40PR2	Die Holder (Used in all current pellet press models*)
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\* These punch and die sets include the bolt and washer or fastener for the punch, but no die holder. A 40PR2 die holder must be added when using any of these sets to replace the A33PR punch and die arrangement used in earlier models of the Parr press.



**Parr Instrument Company**

211 Fifty Third Street Moline, Illinois 61265-1770

1-800-872-7720 | 1-309-762-7716 | parr@parrinst.com | www.parrinst.com