

# Powder-Tech Associates, Inc.

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## PROTOTYPE SINTERED MATERIALS

We supply all grades of sintered and metal powder materials in disc, ring, and bar form, for machining prototype P/M parts and self-lubricating bearings. Sizes run from 1 1/8 in. to 6 1/2 in. diameter by up to 2 in. thick. Greater thickness and diameter are available on special order. We stock metal powders, compact on a 700 or 1,000 ton press, sinter in our pilot plant, and ship in 2-5 days. Materials include iron, bronze, brass, low alloy steel, stainless steel, precious metals, and others. Sintering in D.A. atmosphere or vacuum, as required. Vacuum sintering to 2250°F. Sintered bronze and steel bearing materials are available with or without oil impregnation. Total charge is molding plus materials plus sintering.

Minimum order: Discs and bars-\$25. per diameter and alloy Rings-\$100. per diameter and alloy

### MOLDING CHARGES

Diameter	1-25 pcs.	26-50 pcs.	51-75 pcs.	Over 75
1 1/8	\$22.90	\$21.20	\$19.50	\$18.15
1 1/2	\$22.90	\$21.20	\$19.50	\$18.15
2	\$22.90	\$21.20	\$19.50	\$18.15
2.39	\$22.90	\$21.20	\$19.50	\$18.15
3	\$22.90	\$21.20	\$19.50	\$18.15
3 5/8	\$27.60	\$26.35	\$24.70	\$23.00
4	\$28.30	\$27.00	\$25.60	\$23.60
4 1/2	\$29.50	\$28.10	\$27.10	\$25.45
5	\$33.40	\$31.30	\$30.50	\$29.00
5 1/2	\$44.00	\$42.40	\$41.80	\$40.20
6	\$50.40	\$48.40	\$47.70	\$46.50
6 1/2	\$53.80	\$53.20	\$52.50	\$50.70
<b>RECTANGULAR BARS</b>				
2 5/8 X 2 5/8	\$29.10	\$27.50	\$26.00	\$24.05
1 1/2 X 6.3	\$44.35	\$42.05	\$39.50	\$36.20
4 1/4 X 4 1/4	\$49.80	\$48.40	\$47.50	\$45.90
2 1/8 X 8 1/16	\$55.75	\$54.30	\$53.55	\$51.20
4.4 x 6.5	\$65.00	\$63.40	\$62.80	\$61.70
<b>RINGS</b>				
OD, in. ID, in.				
2 7/8	\$38.40	\$37.60	\$35.28	\$34.25
2.3 .94	\$41.50	\$40.50	\$38.10	\$37.10
3 1 7/8	\$44.20	\$43.40	\$40.75	\$39.75
4 2 7/8	\$53.45	\$53.00	\$50.10	\$48.90
5 3 7/8	\$68.10	\$67.35	\$63.80	\$62.40
6 1/2 4 1/4	\$75.00	\$74.50	\$73.90	\$73.10
6 1/2 3 1/2	\$75.00	\$74.50	\$73.90	\$73.10

(Continued over)  
1-2016

## **MATERIAL & SINTERING CHARGES**

Iron base: material \$4.00/lb, sintering \$4.00/lb. Copper base \$10.50 and stainless steels: \$8.00/lb for material, and \$4.00/lb for sintering. Prices subject to change without notice. Pieces over 5 in. diameter subject to lot charges for sintering. Some mixes may require a separate mixing charge.

Thickness Available - up to 2 in. thick, regular charges; 2 - 3 1/2 in. thick, prices on request.

Repressing or coining is same as molding charge.

Prototype materials to simulate metal injection molding are available.

Test bars - Charpy unnotched, tensile, transverse rupture, V-notch Charpy and Jominy bars available.

## **PROTOTYPE HOT FORGED AND WARM PRESSED P/M MATERIALS**

Powder-Tech produces hot-forged P/M prototype materials by hydraulic compaction on our 700 or 1000 ton press. In our pilot plant, we use 2.3", 3", and 4" diameter tools heated to 600°F. The final forged disc is 1" - 2 1/2" thick. Preforms are molded or machined to the diameter needed to achieve desired lateral flow. The discs are then sintered, cooled, coated with Acheson graphite lubricant, and reheated in DA to the proper forging temperature. For steels, this is 1500-2100°F. The discs are transferred by tongs to the heated die and forged at up to 60 tsi. The pressure is chosen to provide the desired density, which may be varied from 7.4 - 7.8 g/cm<sup>3</sup>.

The charge for the hot forging is \$1800 set up, and \$200 each disc (5- 100 pieces), depending on material and weight. Delivery is less than one week for powders in stock. We stock forging grades of powder. We can have the 4" diameter discs machined into tensile, fatigue, and Charpy bars.

We also produce the warm pressed iron mixes and soft magnetic materials by warm pressing at 290°F. - 500°F., molding at 50-60 TSI, to 7.3-7.4 gm/cc, single pressed. Set-up charge is \$1100. Compaction charge is twice normal compaction charge. Material and sintering charges as above. Delivery in 3-5 days. The warm pressed material can be simulated at lower cost by double pressing and sintering to 7.3-7.4 g/cm<sup>3</sup>. We also offer the use of a heated die at 150°F, unheated powder, set-up charge \$600, with regular molding charges and compaction at up to 50 tsi.

Call Dave Pease, Douglas Pease, Barbara Pease or Lanny Pease to place an order, or to obtain further information. A brochure describing the laboratory is also available. We do referee quality control testing, failure analysis, metallography, mechanical testing, P/M part design, and product and process development.