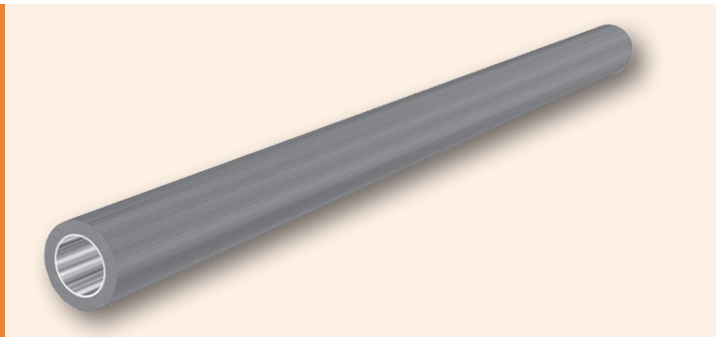
Höganäs



Powder solutions for bimetallic extrusion barrels with centrifugal casting

Smoother operation

Extrusion barrel demands vary in both design and inner surface criteria. Barrel lengths from 300 to 5000 mm, outer diameter from 40 to 450 mm and bore from 15 to 300 mm.

Centrifugal casting with alloy powders solves wear and corrosion problems. Coating thickness 1.6 mm is typical, 1.2 mm as minimum, with 100% substrate bonding. A challenging application with tolerance demands +0.025-0.000 to +0.100-0.000 mm after final polishing and straightness requirement of 0.2 to 0.4 mm.

Choose

Iron base for wear and corrosion resistance. Nickel base for excellent abrasion with low friction coefficient and corrosion resistance. Dual alloy with WC (tungsten carbide) for maximum wear resistance.

For more information, please contact your local sales representative.

Benefits:

- Extend high precision barrel life
- Reduce friction for smoother operation
- Wear resistance ten fold that of nitrided solutions
- Corrosion resistance to withstand aggressive feedstock
- Heat resistant wear to withstand hot abrasion

Powder grades	Hardness HRC*	Alloy	Melting range °C	Choose
1959-72	>59+Wc	Ni base	950-1000	Maximum wear with corrosion resistance
1959-32	59	Ni base	950-1000	Excellent abrasion, low friction & corrosion resistance
3959-10	59	Fe base	1050-1300	Good wear & corrosion resistance
3961-10	61	Fe base	1020-1270	High wear/abrasion balance & corrosion resistance
3963-10	63	Fe base	1020-1270	Excellent abrasion & moderate corrosion resistance

Self-fluxing powders recommended for internal coating of bimetallic extrusion barrels, particularly suited for plastic extrusion. These spherical, satellite free particles are <800 µm, Fe base <500 µm, with a uniformity designed for smooth results.

**Indicative alloy hardness/ typical when PTA tested.*

Centrifugal or spin casting

Coating thickness is defined by the amount of powder weighted. This is charged to the barrel for coating. Use a charging device and keep the barrel horizontal to avoid segregation during filling. Close the barrel at both ends and extract the air. Heat the barrel, use electric furnace or induction coil, to the alloy melting temperature range.

Fuse while rotating the barrel at high speed (e.g. 700 RPM for 40 mm bore). This projects and concentrates the molten hard facing powder to the bore wall. Fusing with partial air removal requires self fluxing alloy powder while vacuum sealed barrels function without flux.

Recommendations

The melting range is the temperature where powder fuses to a dense coating. Heat to this range, for correct alloy structure in the coating. Set the furnace temperature slightly higher to reach this temperature range inside the barrel. Heat transfer from the furnace and through the barrel wall takes time. Larger wall thickness increases the heating time considerably. Medium sized barrels are typically heated for 1 hour. Heating time is a function of barrel mass, bore diameter, coating alloy material and furnace temperature.

Excessive heating results in steel base melting which dilutes the coating and results in lower hardness. Dual alloy 1959-72 with WC (tungsten carbide) for maximum wear resistance. This product's dual nature requires consideration as WC particles have higher density than the alloy. During high speed rotation the WC particles are forced closer to the bore wall by the centrifugal forces.

A well formulated composition for the process conditions is essential. Ensure balance between the WC content, centrifugal speed and coating thickness so a surface layer with sufficient WC is achieved. The correct wear properties on the bore surface after fusing are achieved.

© Höganäs AB (publ.), April 2016. 1505HOG