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Engineer: SLJ **No.:** DI00078
Date Created: 10/13/2021
Date Modified: 11/30/2021

Ball Coating and Hardening Options

Hard coating is a process that applies a highly durable plating to the surface of metal components to increase strength and wear-resistance. Many industrial applications use hard coating as an alternative to rarer or more expensive metals.

Advantages

Hard coating can provide many advantages in industrial applications including increased hardness, scratch prevention, and an increased resistance to corrosion and abrasion. Hard coatings also have smoother surface finishes which can reduce friction.

HMF (Hard Micro Finish) – Hard Coating

Some hard coatings are polished after coating to provide a smoother surface finish. We recommend the use of a polished coating such as HMF. During HMF coating, a series of nickel base alloys is co-deposited onto the cleaned and prepared surface of the ball. Next, the mirror-smooth surface finish is achieved through subsequent steps of hardening and diffusion. The total process gives the ball a 10 Ra (µin) finish, along with 68 Rc (1114HV) surface hardness, exceptional abrasion resistance, and protection against common solvents and corrosion. A 20% torque adder is recommended due to the increased thickness. HMF meets FDA code 21CFR175.300 for food and drug contact.

Kolsterizing - Hardening

Surface hardening can be achieved without a coating through a process called kolsterizing which can increase hardness to 66 Rc (1100HV). Kolsterizing involves the diffusion of large quantities of carbon and/or nitrogen into the surface without the formation of chromium precipitations. This process increases wear-resistance and galling-prevention. Kolsterizing is specifically designed for stainless steels as well as nickel-based and cobalt-chromium alloys. However, kolsterizing is much more expensive and can decrease the surface finish of the component by up to 2Ra. A decreased surface finish on a ball will decrease seat life within the valve and increase torque. Kolsterized components also cannot be polished, as it would remove the treated surface from the component. Because of this, hard coating is preferred.

Standard Ball

A-T Controls' standard ball is made from 316 stainless steel and polished to a surface finish of less than 20Ra. 316 stainless steel has a hardness of 25-39 HRC (250-380HV).

Please consult A-T Controls for material selection for your applications. These parameters are guidelines, and customers are responsible for materials of construction and coatings being compatible with their application. See the manual ball valve part number matrix for part number and contact our sales team for pricing.