

# ***NOBLE* ALLOY VALVE**

## **Nobleizing™ Surface Enhancement Processes**

Noble Alloy Valve is utilizing a number of surface enhancement processes for hardening ball and seats in the ball and check valve product lines. A concerted effort was made in finding hardening processes which could replace applied coatings such as flame spray, weld overlay, and their inherent problems. This has resulted in a variety of processes that will work for most applications on alloys from Aluminum to Zirconium. All these processes have been placed under the moniker of "Nobleizing".

The processes and their applications are described herein. If there are questions regarding an application, please call Noble Alloy and we will be happy to answer your questions.

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### ***NOBLEIZING - A***

Nobleizing - A is an anodizing process for aluminum. The case formed has a hardness level of 60 to 65 Rc with a case thickness ranging from .002" to .008". The process creates good wear resistance plus additional resistance to oxidation.

### ***NOBLEIZING - B***

Nobleizing - B is a thermal diffusion process which diffuses Boron into the metal surface forming boride compound case in the metal surface. The case formed has a hardness level in excess of 1400 Knoop which exceeds the hardness capabilities of flame spraying, carburizing or hard chrome plating. To put the hardness into perspective, 950 Knoop is equivalent to 70 Rc. The case formed is from .0005" to .025" thick depending on the alloy treated. The process can enhance carbon/stainless steels, nickel alloys, cobalt alloys, and carbides. Care must be used in specifying this process as it cannot be used in Nitric acid service. Corrosion can be slightly reduced or improved depending on the alloy. This process is excellent up to temperatures in excess of 1500F.

### ***NOBLEIZING - Q***

Nobleizing - Q is a thermochemical diffusion process which forms tough nitride compound in the surface of parts with wear properties 200 to 1000% improvement. Hardness levels are around 71Rc with a depth of .004" to .008". This process can be applied to carbon steels, austenitic steels / stainlesses, and alloy steels. Corrosion resistance is increased in carbon steels but will be reduced in stainless steels. This process is excellent for metal seating in services that require high wear resistance with low to medium corrosion resistance requirements. This process is limited to a maximum service temperature of 900F.

### ***NOBLEIZING - R***

Nobleizing - R was developed at Noble Alloy Valve for the hardening of refractory metals including Zirconium, Titanium, Tantalum, and Niobium/Titanium. **Nobleizing is exclusive to Noble Alloy.** Utilizing fluidized bed technology, a tough wear resistant case is produced which will not spall or peel. Hardness values from 56 Rc to 74 Rc are achievable with a depth of case to .007". Parts can be flexed or bent without spalling or cracking. Corrosion resistance is equal to or better than the base metal. Noble Alloy Valve is the only valve company known with this process and the ability to manufacture metal seated valves in refractory metals with no applied coatings.