VACUUM PROCESSING

ADVANTAGES OF VACUUM & CRYOGENIC TREATMENT

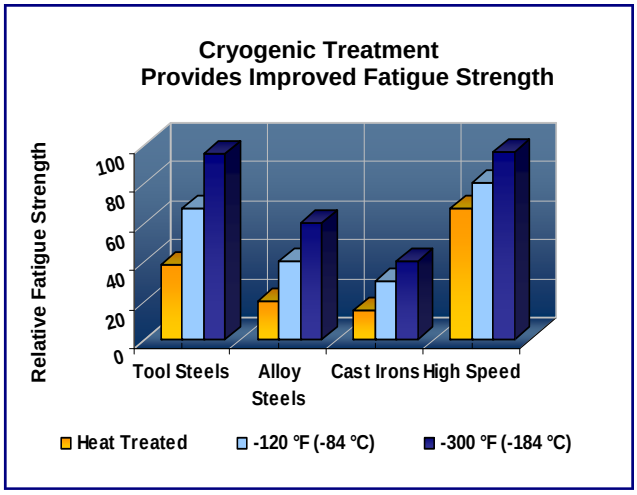
VACUUM HEAT TREATING CONSISTS OF THERMALLY PROCESSING METAL PARTS IN A "GAS-TIGHT" SEALED FURNACE THAT HAS HAD THE ATMOSPHERIC GASES REMOVED. NITREX HAS SEVERAL SUCH FURNACES AT DIFFERENT LOCATIONS TO MEET YOUR SPECIFIC NEEDS. CRYOGENIC TREATMENT IS FREQUENTLY USED AS AN ADD-ON PROCESS AFTER VACUUM HARDENING & TEMPERING CYCLE.

Depending on the required properties we may use either of the following two equipment configurations:

- gas (nitrogen or helium) integral quench, or
- oil integral quench.

There are numerous advantages of vacuum heat treating, as opposed to conventional methods. The following is only a partial list:

- eliminates the need for copper plating on hardening-sensitive steels,
- eliminates surface oxidation or decarburization
- facilitates uniform heating of the work piece
- eliminates the risk of inadvertent carburization or decarburization, present if a work piece is treated in a conventional furnace,
- produces a bright surface finish on martensitic stainless steels and air-hardening tool steels
- it is significantly more economical than processing in hydrogen furnaces.



After vacuum treatment it is frequently desirable to subject the work piece to a cryogenic treatment. This process induces carbide particles to precipitate into voids in the iron lattice, thus creating a denser, more stabilized structure that reduces friction, wear and thermal softening. In summary the process:

- converts retained austenite (soft) into martensite (hard),
- increases strength, toughness, stability and durability,
- increases the density of the steel structure,
- lowers the coefficient of friction,
- decreases residual stresses and brittleness, and
- significantly improves abrasive wear resistance.

For locations of our metal treatment service centers, please visit our website under Metal Treating Services, call 702-399-1554, or email us at nitrexusa@nitrex.com.