

# Vacuum Heat Treating

## Precise Temperature Processing

Vacuum heat treating provides the required part hardness or ductility with bright, scale-free results for a variety of applications.

- Annealing
- Hardening
- Tempering
- Normalizing
- Homogenizing
- Vacuum degassing
- Precipitation hardening
- Diffusion treating
- Stress relieving
- Solution treating
- Hydriding

## Furnace capability includes:

- 12 foot deep, 15,000 lb. loads
- 10 bar quenching
- All metal hot zone
- Air tempering
- R&D furnaces

## Memberships and certifications

- Mil-H-6875 and ISO 10012-1 standards
- NADCAP certification
- Member of Metal Treating Institute



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## The Process

The advancement of vacuum technology and computer processors provides precision processing for bright, clean parts. In a non-contaminating vacuum environment, metal parts can be hardened, tempered and annealed without the impurities of the atmosphere. The metal parts can be purified as vacuum heating causes an out-gassing of unwanted elements in the metal.

More importantly, vacuum heat treating enables parts to meet the demanding metallurgical standards for the 21<sup>st</sup> Century and will continue to satisfy requirements into the future. Computer controls interface with part measuring thermocouples to control and monitor the heating and quenching (cooling) cycles. The vacuum environment with computer controlled cycles enables the processed parts to meet the required hardness or ductility standards. Solar records every heat treating cycle on computer and its skilled staff consults regularly with customers to assure that all parts achieve the desired results.

Solar has implemented these advancements to offer the best in heat treat processing and to respond to the metallurgical demands of today's engineering.

## The Advantages

All production cycles are generated and maintained by fully digital computers and are monitored with part measuring thermocouples to assure the accurate processing of all parts.

Specific gases and vacuum atmospheres enhance the bright, scale-free results of the heat treating process. *Nitrogen, argon, hydrogen and helium* for positive pressure gas quenching provide precision hardening.

### Specialized Vacuum Heat Treating Processes

- *Titanium, tantalum, samarium and other reactive metal heat treating* with high vacuum process prevents oxidation
- Hydriding and dehydriding
- Partial pressure atmospheres to avoid vaporization of elements in the base material

### Complementary Processes

- *Steam treating*, an alternative to black oxide coating
- NBP™ Liquid Cryogenic processing maximizes material stability, wear life and toughness

## The Ability

Solar's ability is founded on our uncompromising work ethic as specialists in vacuum heat treating. Our commitment is to perform with an emphasis on quality and responsiveness while operating with an awareness and appreciation for the value of our customer's parts.

Solar builds on our work ethic with state-of-the-art equipment ranging from R&D lab furnaces to one of the largest horizontal vacuum furnaces in the United States. All furnaces have computer processors and recorders for precision control and data recordings needed for certification.

We provide a wide variety of services all structured to ensure your complete satisfaction.

- Well-equipped, up-to-date quality control and metallurgical laboratory
- Diversified handling and fixturing capability for efficient processing of loads from small fasteners to large assemblies
- Consultant services for metallurgical advice and customized heat treating cycles
- Quick turnaround with around-the-clock operation seven days a week
- Pickup and delivery for regional customers

As one of the largest vacuum heat treating companies on the East Coast, Solar Atmospheres Inc. has the equipment, the expertise and the experience to meet today's demanding standards.