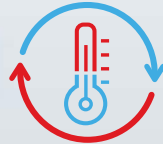




Cryogenic Cooling & Heating System



from -150 to +250°C

CRYOGENIC COOLING & HEATING SYSTEMS

CRYO Series



Vacuum Insulated



Standard Sizes	Working Zone (WxLxH) (mm)	Load Cap. (Kg)
CRYO-S	600 x 900 x 600	600
CRYO-M	900 x 1200 x 900	1.000

CRYO SERIES FEATURES

- Stange control system for cooling and heating,
- Minimum heat losses due to vacuum insulated body and cover structure,
- Double walled retort structure,
- Recipe recording infrastructure,
- Pressure and flow control and minimum nitrogen consumption,
- Repeatable processes,
- Stainless steel construction,
- Unique and intelligent design,
- Dimensions suitable for vacuum quenching furnaces,
- $\pm 5^\circ\text{C}$ temperature uniformity,
- Safe pressure relief and safety valve before cover opening,
- **Maximum pressure** : 2 bar
- **Working pressure** : 100-500 mbar
- **Operating temperature** : from -150°C to $+250^\circ\text{C}$
- **Optional** : On heating 620°C
- Gas nitrogen atmosphere during the tempering process,
- No corrosion effect and color change during processing.

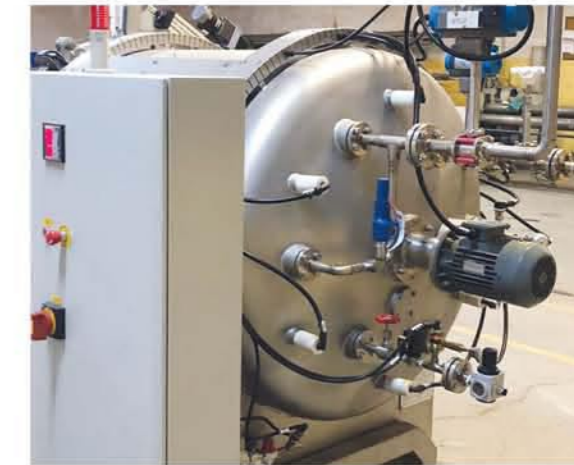
Cryogenic treatment benefits

- Transformation of retained austenite into martensite,
- Internal stresses relief affecting most mechanical properties
- Precipitation of fine carbides particles (η -carbides) uniformly distributed in the martensite grains.
- More homogeneous microstructure due to reduction of micro-voids (pores, cracks)



Applications:

Cutting tools : sawing, milling, drilling, broaching, turning, slitting, shearing;
Metal forming tools : dies, molds, punches.
High precision parts : gauges, guides, shafts;
Parts of high performance (sport) car engines and transmissions : crankshafts, connecting rods, piston rings, engine blocks, gear parts, camshafts.



Stange SE-702

Advantages of Cryogenic Treatment

- Higher wear resistance
- Higher mechanical strength
- Better toughness
- Better fatigue strength
- Lower coefficient of friction
- Better grinding and polishing practices

STEELS	DIN 1.3343	DIN 1.2379	DIN 1.2436
Hardness After Quench	63 HRC	62 HRC	64 HRC
Stress Relieved (150°C)	63 HRC	61-62 HRC	62-63 HRC
Cryogenic Process (-150°C / 6 Hours)	67 HRC	63-65 HRC	65-67 HRC



With;

- Strong research and development background on materials science and applications,
- Innovative design and turnkey system producing capabilities for all kinds of furnaces for the heat treatment processes on demand of critical industries,
- Unique facilities for design, analysis and manufacturing operations,
- Market-driven solutions as required by the related sectors, including aviation, defence, power and petrochemical production, etc..
- Highly qualified staff and technical team,
- Well-committed, sustainable relationships with customers.



Teknovak is your solution partner!..



Online Support • Training • Technical Control • Consultancy • Upgrade • Inspection
Spare Part Support • Repair & Maintenance • Start-up & Assembly
Compliance & Safety Check

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