



CASE STUDY - KOYO JTEKT, US - SYSTEM 250 70/60

PROJECT :

- > Implementation of a heat treating line in the USA following a first installation in Japan
- > Designed by CODERE, manufactured and commissioned by PYRADIA

PRODUCT :

- > Needle Roller Bearings for OEMs and Tier1 Automotive manufacturers
- > Load diameter : 27.56" (700mm)
- > Load height: 23.62" (600mm)
- > Max load gross weight: 770 lbs (350 kg)



PROCESSES :

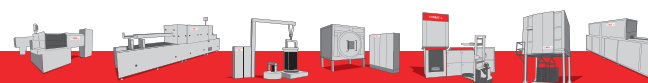
- > Austenizing (Hardening)
- > Carburizing
- > Carbonitriding
- > Tempering

CONFIGURATION:

- > 3 heating zones - Max temperature $1000^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($1830^{\circ}\text{F} \pm 10^{\circ}\text{F}$)
- > Two mobile furnaces for heat treatment under protective atmosphere, C10, equipped with fume extraction systems
- > Salt quenching tank, S4 - 450°C (840°F)
- > Washing machine by spraying, XL - 3 tanks
- > Salt recycling system (capacity: 30 l/h)
- > Manually loaded
- > Tempering furnaces
- > Load transfer from the furnace module to the quench tank by sliding (Patent)

PERFORMANCE :

- > No temperature loss or process atmosphere disturbance during transfer of quenching of the load
- > Compact, easy set-up, low maintenance
- > Low running costs
- > Precise temperature et carbon potential control
- > Modular system
- > Minimal part distortion
- > Precise carburising depth
- > Repeatable process (hardness, distortion, microstructure)



BATCH FURNACE LINE in modular construction

> HOW DOES SYSTEM 250 FUNCTIONS ?

The furnace of system 250 is moving (WITH THE LOAD) using a very simple sliding system. This movement is done under protective atmosphere so at no time does your parts/load get in contact with air, they are protected by our furnaces atmosphere during the whole cycle.

1

M - MM - MMM
Manipulator: manually operated, motorized or automatic mode handling by integrated manipulator

2

LA2
Alkaline washing
1-2 tanks / 2-3 tanks
spraying
immersion (floatation)
drying (under vacuum)

3

CR6 - CR66 - CR66H
Furnace: with or without protective gas
pre-heating, tempering, annealing, nitriding
nitrocarburising, oxy-nitriding
650°C - 750°C (1200 - 1400°F)
with or without cooler sub0 : -120°C (-180°F)

4

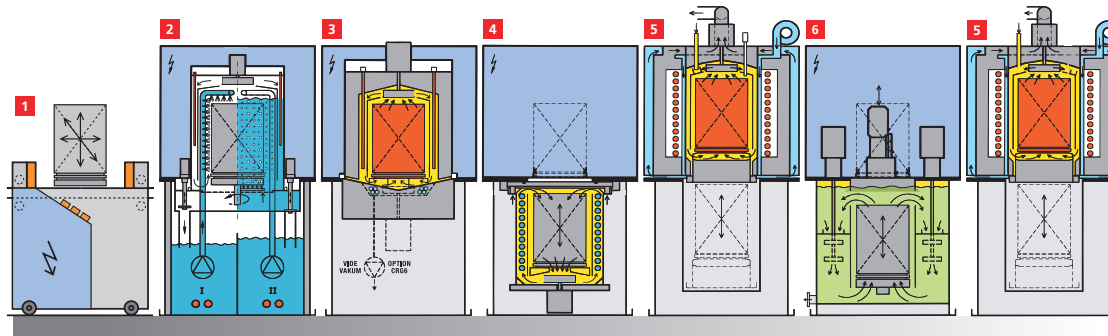
N2BP - N2HP
Cooling/Quenching
under gas (or air),
1-6 bar abs (15-90 psi)

5

CH9 - C10 - C11
Furnace: pre-heating,
annealing, austenitising,
carburising, carbonitriding,
brazing 1050°C - 1100°C (1900-2000 °F)

6

E - M1 - M2 - S4
Quenching bath:
water
polymers
oil : max. 100°C (212 °F)
oil : max. 200°C (392°F)
salt : max. 450°C (840 °F)



> Description

- Modular bell-furnace with stations separated functionally and direct quenching transfer
- The quench transfer system from the furnace to the quench tank is carried out by a simple sliding of the load without any hooking mechanism

- Maximum working temperature: 1100°C (2000°F)
- Maximum gross load with loading fixtures: 5 ton
- Maximum useful load height: 14' 9" (4500 mm)

> Main properties

- Integration of various quenching options enabling a greater variety of furnace/tank combinations
- Easy extension of existing line with new requirements, both in terms of capacity and treatments
- Particularly suitable for production of parts in medium and small production runs requiring flexibility of heat treatment parameters (temperature and atmosphere)
- Suitable for thin and long parts which risk of distortion
- Quench transfer under atmosphere without loss of temperature before quenching the load
- System 250 operates in manual or full automatic mode

> Fields of application (under protective gas)

- Austenizing (hardening) • Carburizing • Carbonitriding
- Nitriding, nitrocarburizing, oxy-nitriding • Annealing, tempering and brazing
- Treatments up to 1100°C (2000 °F)
- Solution heat treatment and ageing
- Working under argon is possible for titanium alloys

> Quenching medium with suitable washing

- Water • Oil • Molten salt • Nitrogen
- Alkaline washing • Washing with solvents

I Console for programming and visualization

Treatment program
Control and monitoring system

Printing of all heat treatment records / parameters

Treated in a batch furnace in modular construction

