

Which Furnace for Which Process?

Preheating for Forging

- Press Hardening
- Heating of sheet metals
- Preheating of molds

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- Bogie hearth furnaces
page 38
- Bogie hearth furnaces gas-fired
page 41
- Chamber furnaces gas-fired
page 42
- Chamber furnaces
page 43/44
- Lift-top furnaces
page 46
- Rotary hearth furnaces
page 54
- Continuous furnaces
page 56



Annealing furnace with electro-hydraulic lift-door on transportable base for preheating of large steel sheets for the automotive industry see page 44

Hardening, Annealing

- Ageing
- Austempering
- Diffusion annealing
- Pack hardening
- Recovery annealing
- Coarse grain annealing
- Hardening
- Solution annealing
- Annealing
- Recrystallization annealing
- Stress-relieving
- Soft annealing

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|--|--|---|
| in Air | under Protective Gases,
Reaction Gases or in Vacuum | in Salt Bath |
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| Air circulation pit-type furnaces
page 36 | Hot-wall retort furnaces
page 10 - 13 | Salt-bath furnaces
page 52 |
| Pit-type and top-loading furnaces
page 37 | Cold-wall retort furnaces
page 14 - 19 |  <p>Salt-bath furnace TS 40/30 with exhaust gas collection at crucible rim see page 52</p> |
| Bogie hearth furnaces
page 38 | Bogie hearth furnaces with annealing box
page 38 | |
| Bogie hearth furnaces gas-fired,
page 41 | Chamber furnaces with annealing box
page 43 |  <p>Water quench tank with powerful water-circulation</p> |
| Chamber furnaces gas-fired
page 42 | Lift-top furnaces with annealing box
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| Chamber furnaces
page 43/44 | Rotary hearth furnaces
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| Strand annealing furnaces
page 58 | | |
| Wire annealing furnaces
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NR 200/11 H₂ for operation with hydrogen see page 10

Quenching

- Water
- Air
- Oil
- Polymer

- ↓
- Quench tanks
page 49
- Water quench tanks
page 60 - 63

Tempering, Annealing

Heat Treatment Systems

- Tempering
- Precipitation annealing
- Ageing
- Recovery annealing
- Solution annealing
- Preheating
- Reduced hydrogen annealing

- Solution annealing
- Quenching
- Artificial ageing

in Air

under Protective Gases, Reaction Gases or in Vacuum

in Salt Bath

Heat Treatment Systems

- Chamber dryers
page 20
- Air circulation chamber furnaces > 500 liters
page 22
- Air circulation chamber furnaces < 500 liters
page 26
- Air circulation chamber furnaces with cleanroom technology, page 29
- Air circulation bogie hearth furnaces
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- Air circulation pit-type furnaces
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- Pit-type and top-loading furnaces
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- Hot-wall retort furnaces
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- Air circulation chamber furnaces with annealing box, page 26
- Air circulation chamber furnaces with annealing box, page 29
- Air circulation bogie hearth furnaces with annealing box, page 32
- Air circulation pit-type furnaces with annealing box, page 35
- Rotary hearth furnaces
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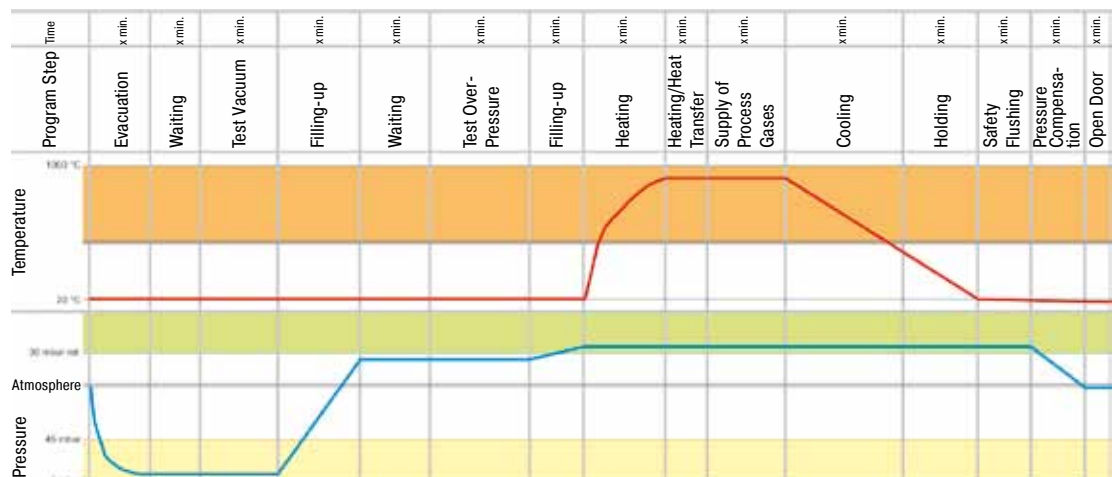
- Martempering furnaces
page 53

- Fully automatic tempering systems
page 60/61
- Manual heat treatment systems
page 62/63



Manual heat treatment system for hardening of steel rods see page 62/63

Process flow chart



Which Furnace for Which Process?

Brazing/Soldering

- Soft soldering
- Brazing
- High-temperature brazing

- Dip brazing of steel
- Dip brazing of aluminum

Curing, Tempering, Drying

- Composites
- Molds
- Adhesive
- Plastics
- Lacquers
- PTFE
- Silicone
- Surface Drying
- Preheating
- Vulcanizing

under Protective Gases

Hot-wall retort furnaces
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Cold-wall retort furnaces
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Air circulation chamber furnaces with annealing box, page 26

Chamber furnaces with annealing box, page 43

in Salt Bath

Salt-bath furnaces
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in Vacuum

Hot-wall retort furnaces
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Cold-wall retort furnaces
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Solvent Based

Hot-wall retort furnaces
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Chamber dryers
page 20

Air circulation chamber furnaces EN 1539
page 28

Air circulation ovens with bogie hearth
page 34

Water Based

Chamber dryers
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Air circulation chamber furnaces
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Ovens
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Air circulation bogie hearth furnaces
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Air circulation pit-type furnaces
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Rotary hearth furnaces
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Continuous furnaces
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Brazing in a gas-supply box

VHT 500/22-GR H₂ with graphite insulation and heating see page 14

**Surface Treatment
 Thermal/Thermo-Chemical Processes**



- Carburizing
- Blueing (e.g. with water steam)
- Nitriding/nitrocarborizing
- Oxidizing
- Deoxidizing under hydrogen

Sintering & Debinding



- Debinding
- MIM
- CIM
- Sintering

in Salt Bath



Salt-bath furnaces
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**under Protective
 Gases, Reaction Gases**



Hot-wall retort furnaces
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Cold-wall retort furnaces
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 furnaces with annealing
 box, page 26

Air circulation bogie
 hearth furnaces with
 annealing box, page 32

Bogie hearth furnaces with
 annealing box
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Chamber furnaces with
 annealing box
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Overview
 annealing boxes
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in Powders



Hot-wall retort furnaces
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Cold-wall retort furnaces
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Air circulation chamber
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Bogie hearth furnaces
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Lift-top furnaces
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**under Protective Gases,
 Reaction Gases or in Vacuum**



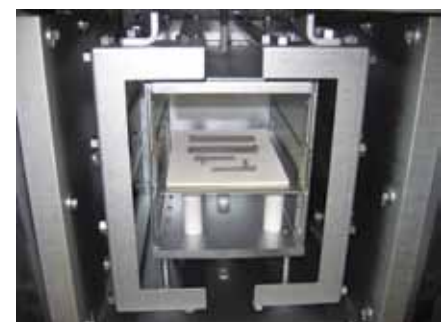
Hot-wall retort furnaces,
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Cold-wall retort furnaces,
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Retort furnaces for
 catalytic debinding, see
 separate catalog:



Blueing of drills in water steam atmosphere in a furnace of the NRA range see page 12



Sintering of MIM titan parts in a VHT furnace