

Which Furnace for Which Process?

Preheating for Forging

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

Hardening, Annealing

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

Quenching

- Water
- Air
- Oil
- Polymer



in Air

under Protective Gases, Reaction Gases or in Vacuum

in Salt Bath

Bogie hearth furnaces
page 38

Air circulation pit-type
furnaces
page 36

Hot-wall retort furnaces
page 10 - 13

Salt-bath furnaces
page 52

Quench tanks
page 49

Bogie hearth furnaces
gas-fired
page 41

Pit-type and top-loading
furnaces
page 37

Cold-wall retort furnaces
page 14 - 19

Water quench tanks
page 60 - 63

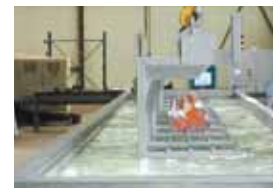
Chamber furnaces
gas-fired
page 42

Bogie hearth furnaces
page 38

Bogie hearth furnaces with
annealing box
page 38



Salt-bath furnace TS 40/30
with exhaust gas collection at
crucible rim see page 52



Water quench tank with powerful
water-circulation

Chamber furnaces
page 43/44

Bogie hearth furnaces
gas-fired,
page 41

Chamber furnaces with
annealing box
page 43

Lift-top furnaces
page 46

Chamber furnaces
gas-fired
page 42

Lift-top furnaces with
annealing box
page 46

Rotary hearth furnaces
page 54

Chamber furnaces
page 43/44

Rotary hearth furnaces
page 54

Continuous furnaces
page 56

Lift-top furnaces
page 46

Rotary hearth furnaces
page 54

Continuous furnaces
page 56

Strand annealing furnaces
page 58

Wire annealing furnaces
page 58



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



NR 200/11 H₂ for operation with hydrogen see page 10

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
page 32
- Air circulation pit-type furnaces
page 35/36
- Pit-type and top-loading furnaces
page 37
- Rotary hearth furnaces
page 54
- Continuous furnaces
page 56

- Hot-wall retort furnaces
page 10 - 13
- 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
page 54
- Continuous furnaces
page 56

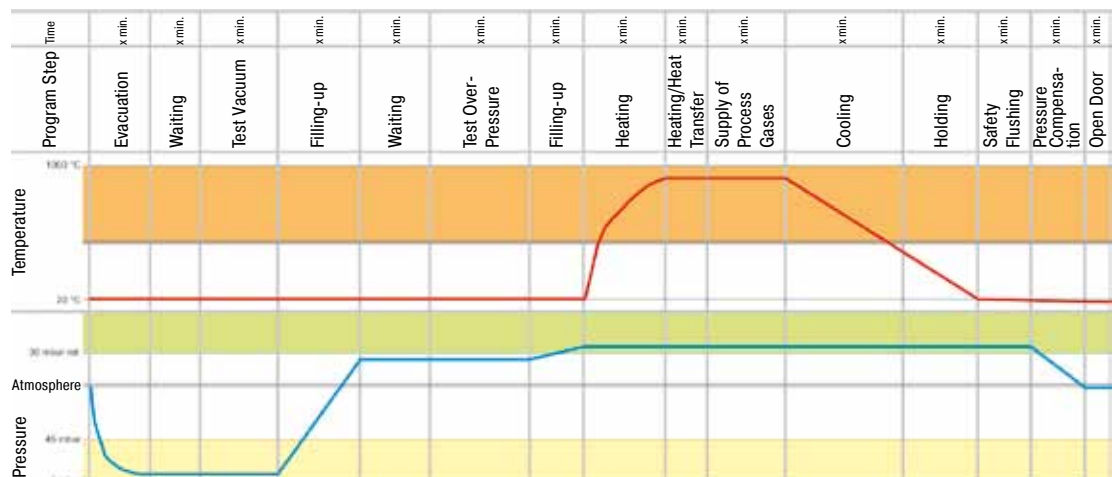
- Martempering furnaces
page 53

- 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

Curing, Tempering, Drying

- Soft soldering
- Brazing
- High-temperature brazing

- Dip brazing of steel
- Dip brazing of aluminum

- Composites
- Molds
- Adhesive
- Plastics
- Lacquers

- PTFE
- Silicone
- Surface Drying
- Preheating
- Vulcanizing

under Protective Gases

in Salt Bath

in Vacuum

Solvent Based

Water Based

Hot-wall retort furnaces

page 10 - 13

Salt-bath furnaces

page 52

Hot-wall retort furnaces

page 10 - 13

Hot-wall retort furnaces

page 10 - 13

Chamber dryers

page 20

Cold-wall retort furnaces

page 14 - 19

Cold-wall retort furnaces

page 14 - 19

Chamber dryers

page 20

Air circulation chamber furnaces

page 26

Air circulation chamber furnaces with annealing box, page 26

Air circulation chamber furnaces EN 1539 page 28

Ovens page 30

Chamber furnaces with annealing box, page 43

Air circulation ovens with bogie hearth page 34

Air circulation bogie hearth furnaces page 32

Air circulation pit-type furnaces page 35/36

Rotary hearth furnaces page 54

Continuous furnaces page 56



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
 page 52

**under Protective
 Gases, Reaction Gases**



- Hot-wall retort furnaces
 page 10 - 13
- Cold-wall retort furnaces
 page 14 - 19
- Air circulation chamber
 furnaces with annealing
 box, page 26
- Air circulation bogie
 hearth furnaces with
 annealing box, page 32
- Bogie hearth furnaces with
 annealing box
 page 38
- Chamber furnaces with
 annealing box
 page 43
- Overview
 annealing boxes
 page 50

in Powders



- Hot-wall retort furnaces
 page 10 - 13
- Cold-wall retort furnaces
 page 14 - 19
- Air circulation chamber
 furnaces
 page 26
- 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
- Overview
 annealing boxes
 page 50

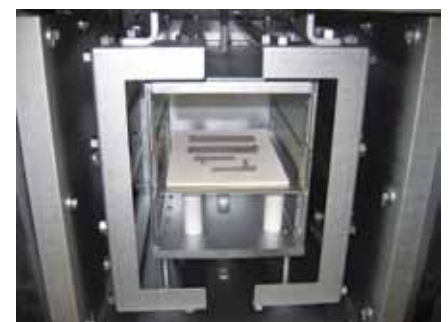
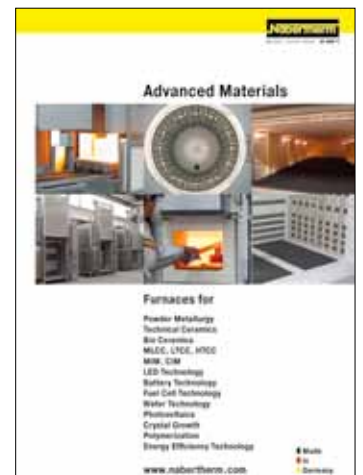
**under Protective Gases,
 Reaction Gases or in Vacuum**



- Hot-wall retort furnaces,
 page 10 - 13
- Cold-wall retort furnaces,
 page 14 - 19
- 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