T.T.N. GROUP

a single reference
a single answer
a single partner

Since 1978 working for customer service

T.T.N. GROUP

Trattamenti Termici Nervianesi
T. T. N.

CRT S.r.l.

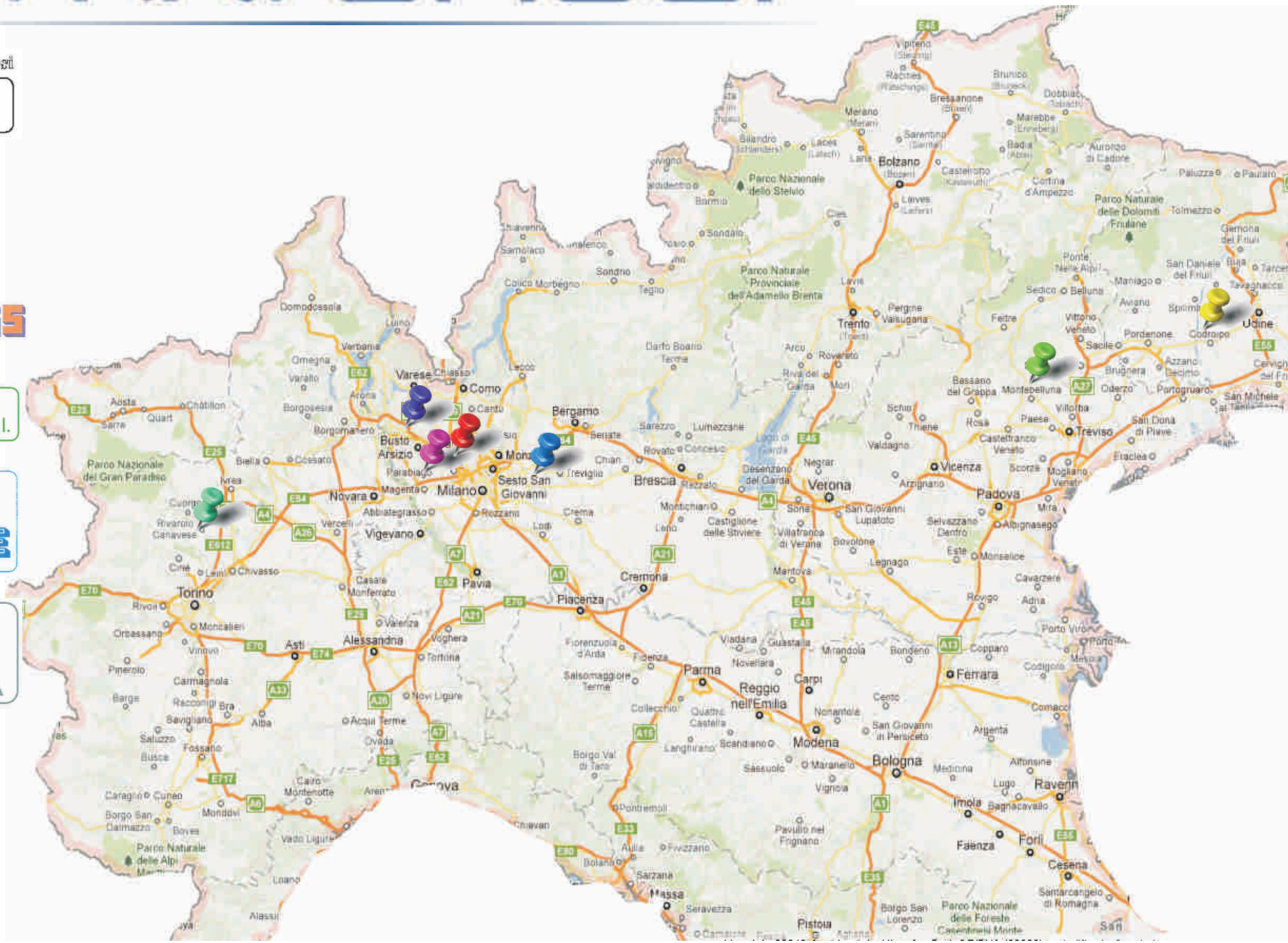
OMNIA PRESS

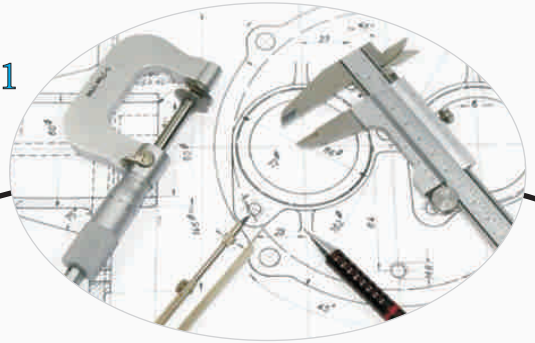
T. T. C. S.r.l.

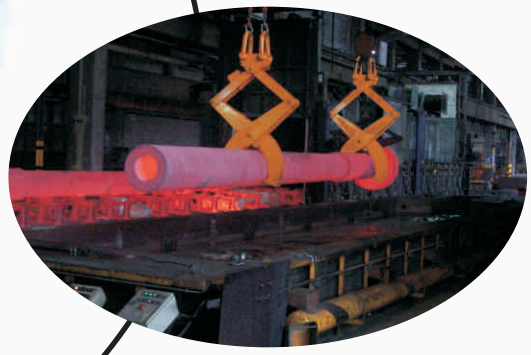
T.T.N. PIEMONTE

T.T.N. VENETA

Friulforgia srl



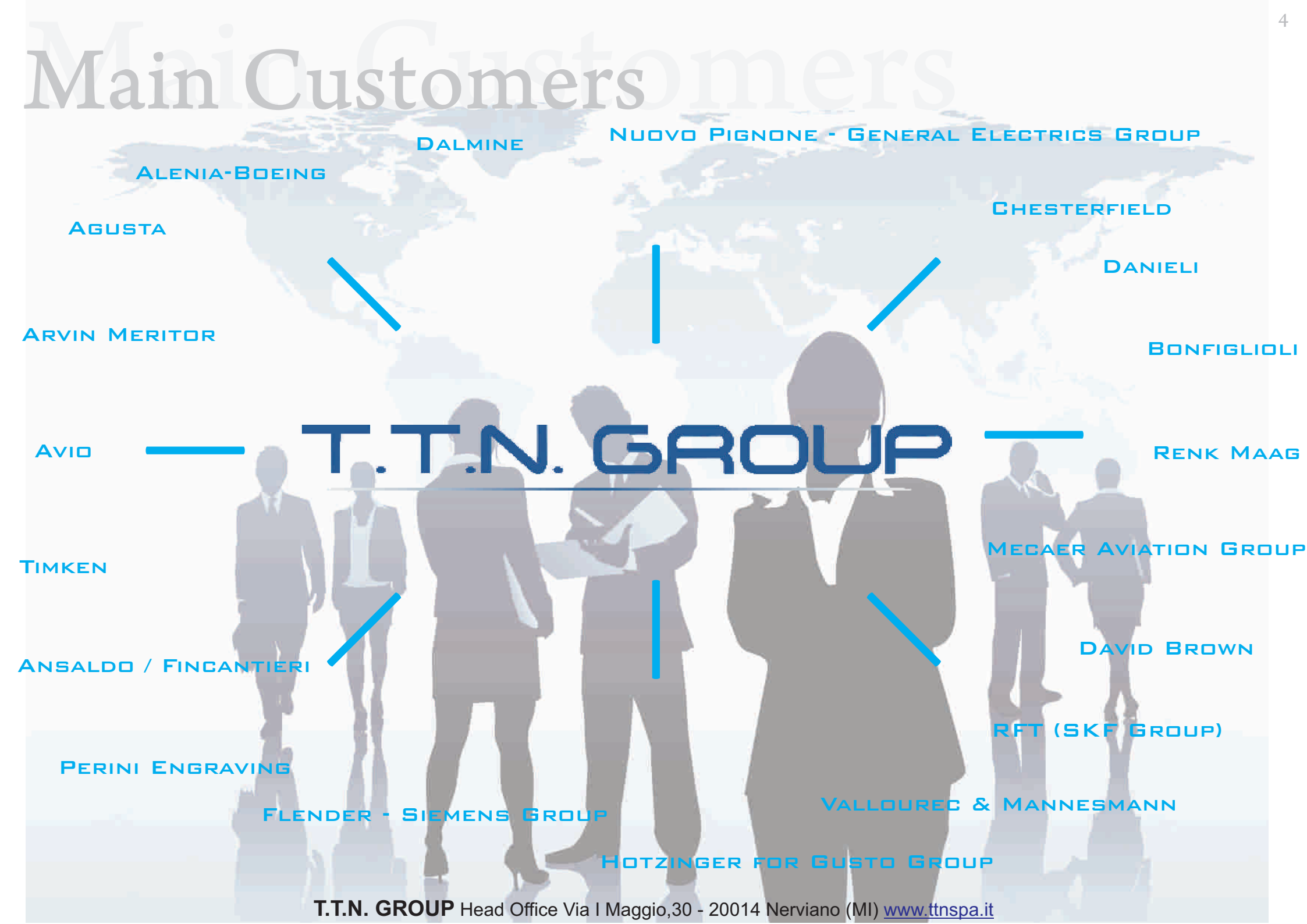




1. Design & Steel Selection
2. Forging
3. Heat Treatment
4. Machining
5. Quality Control
6. Surface Treatment
7. Laboratory

Integrated Supply

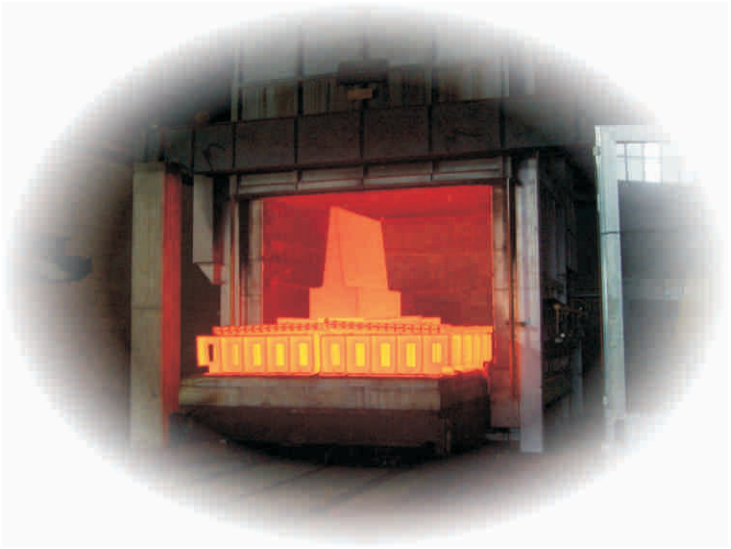
Main Customers



Closed Forging Department

- *N° 2 Presses 2500 ton*
- *N° 1 Manipulator 12 ton*
- *N° 1 Manipulator 25 ton*
- *N° 2 Forging ovens 60 ton.*
- *N° 1 Forging ovens 100 ton.*
- *11m heat treatment oven with 2 soles*
- *2x2m hacksaws*
- *Laboratory*

T.T.N. GROUP



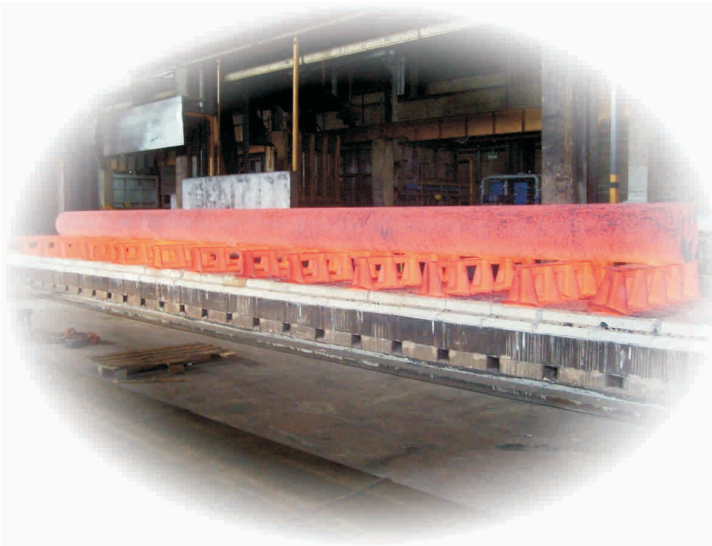
Annealing

Stress Relieving

Normalizing

Solubilizations

Quenching and Tempering:
Water, Oil, Aqua Quench



Massive Heat Treatments

T.T.N. GROUP

Plants

Heat Treatment oven up to dimensions 2500x2000x16000 mm for Annealing, Stress Relieving, Normalizing, Quenching and tempering of medium/big components
Crane carrying capacity: 40ton, furnace carrying capacity up to 80ton
Quenchinbg bath: water and/or aqua quech (11-24%) 16000x3000 depth 3000mm.
Semi-automatic furnace line: n°3furnaces 3000x3000x2000mm, n°2 quenching baths oil, water and/or aqua quech
Continuous Furnace for Isotermic Annealing and Oil Quenching and Tempering for little dimensions pieces.

Additional Operations

STRAIGHTENING OPERATION: n° 4 Straightening presses for dimensions up to Ø550x16000mm

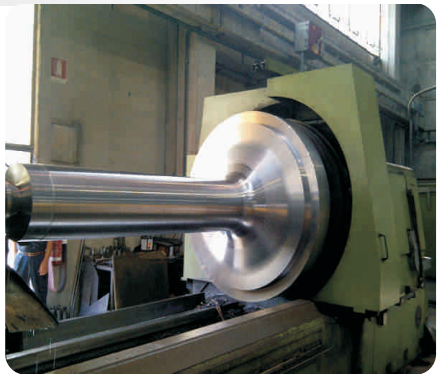
NON DESTRUCTIVE CHECKS: Magnaflux, Penetrant Liquids, Ultrasonic Test

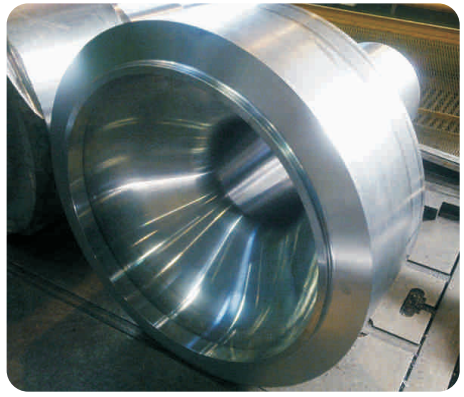
Massive Heat Treatments

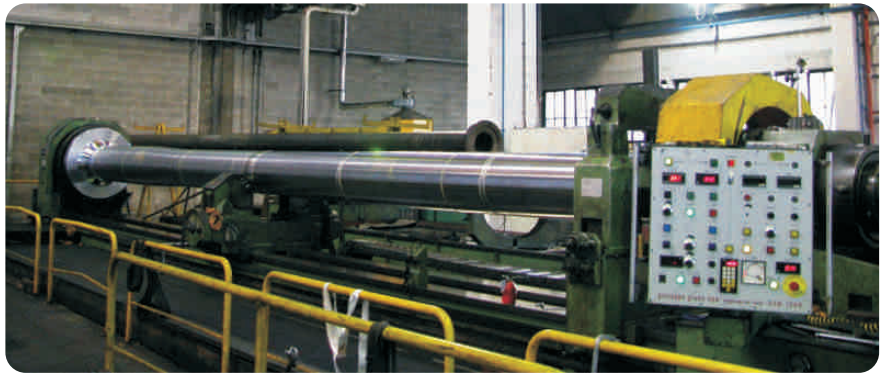
T.T.N. GROUP

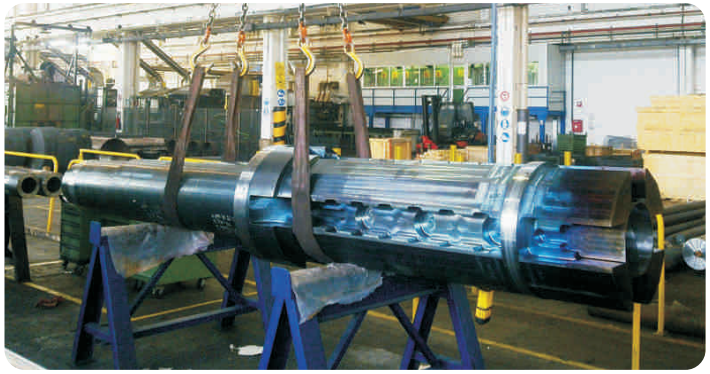
Mechanical Machining

. Roughing and Finishing Turning CN up to 14000 mm
. Roughing and Finishing Vertical Turning CN up to Ø2000x1500 mm
. Deep Drilling from Ø25 to Ø910 up to 14000 mm
. Peripheral Deep Drilling from Ø25 to Ø160 up to 8000 mm
. Lapping from Ø25 to Ø650 up to 14000 mm
. Boring CN up to 11000 mm









T.T.N. GROUP

Warehouse Steels

Stock steel leader in Italy and Europe for the marketing of nitriding and carburizing steels:

- *41CrAlMo7 (W.1.8509)*
- *34CrAlNi7 (W.1.8550)*
- *31CrMoV12 (W.1.8519)*
- *18NiCrMo5*

laminates from Ø20 to Ø290mm
forged from Ø300 to Ø1100mm

Availability of construction steel, hot working and cold steels thanks to agreements that TTN S.p.A. have with the major European steel mills

Offered Services:

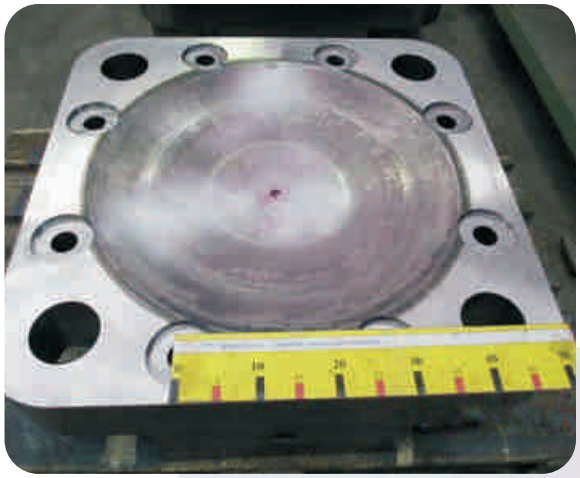
- *Checks with our laboratory*
- *Control UT - MT - mechanical tests*
- *Cut to size*

T.T.N. GROUP

TTN has plants for induction hardening both in horizontal and in vertical for shafts, pistons and cylinders up to Ø550mm and a table height of 5m in Vertical, Ø600mm table length 12m in horizontal for a total weight of 20tons.
The same machines in control of synchronous rotation of the piece and feed of the inductor are used for the induction hardening of press columns, calendering and lamination cylinders.
On all the pieces it is guaranteed a strain check and a straightening phase with maximum arrows of 0.2-0.3 mm.
The frequencies used can reach depths of the order of 6mm

Induction Hardening

T.T.N. GROUP



TTN offers plants for induction hardening on pallets and slip planes of boring machines, turning machines, milling machines, etc..
We can heat treat basements and guides with dimensions up to 13m of lenght and 2m of height with a total weight of 250tons.
Profiles and hardening depth are guaranteed by control systems and thanks to inductors built directly from our personnel.
TTN performs, always with numerical control systems, induction hardening on gears, pinions, toothing gears with straight, spiral, conical and gleason teeth on carbon steel and cast iron. The hardening occurs with the piece both stationary and in rotation.

Induction Hardening

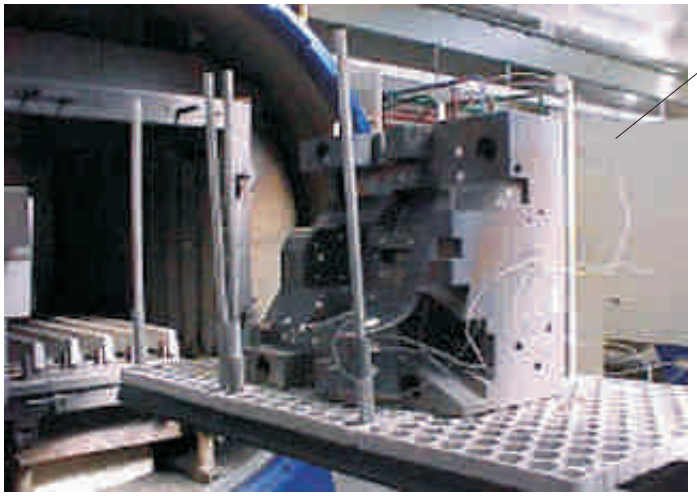
T.T.N. GROUP

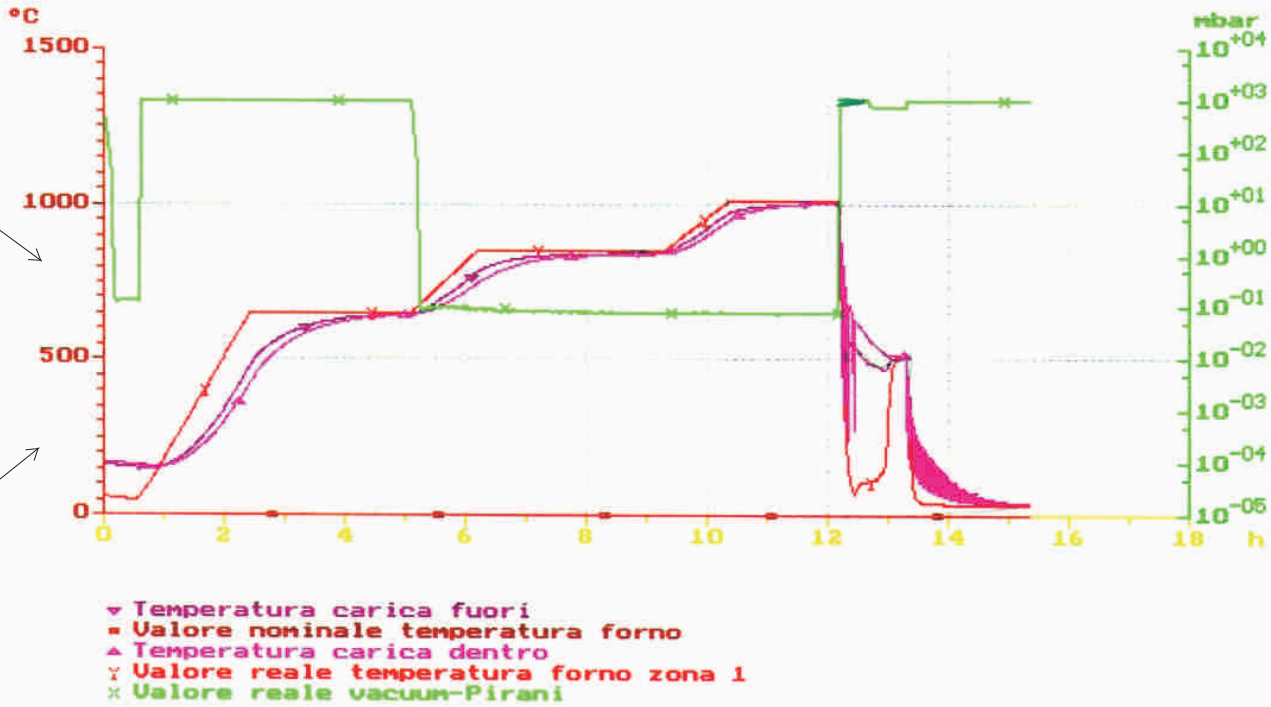
Component for plastic materials moulding, in 1.2343, subjected to 5 bar pressure vacuum quenching - thermal bath simulated. The thermocouples shown monitor the whole thermal cycle on both surface and core at the same time.

Vacuum quenching plant with dimensions since 600 x 900 x 600 mm to 1200 x 1200 x 1800 mm, quenching capability up to 2 Tons or solution annealing of stainless steel lots - temperature uniformity class 5.
Quenching gas used: 10 bar nitrogen, 20 bar helium.

The picture shows AISI H13 steel rolls for profiling industry.

Vacuum Hardening

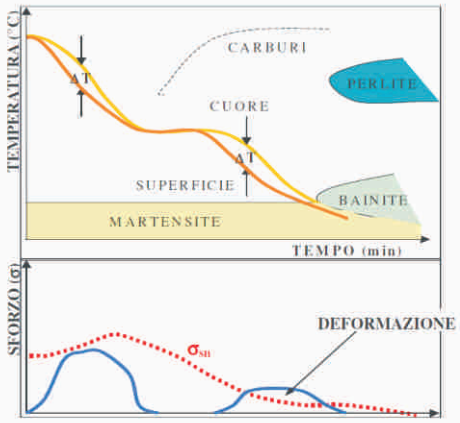




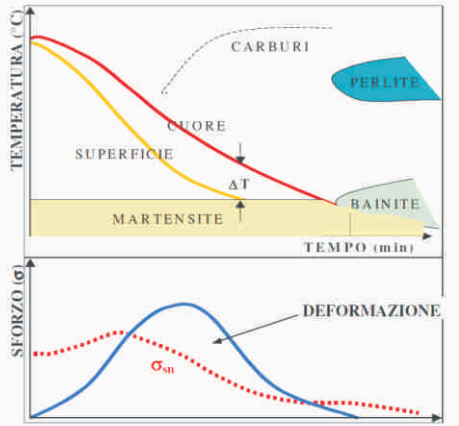
Graph provided to the customer for each vacuum quenching lot, recorded with core and surface thermocouples put on to the mould.

Two different vacuum heat treatments:
in the first photograph it is reported an example of salt-bath quenching;
in the second one, instead, an example of vacuum quenching.

T.T.N. GROUP

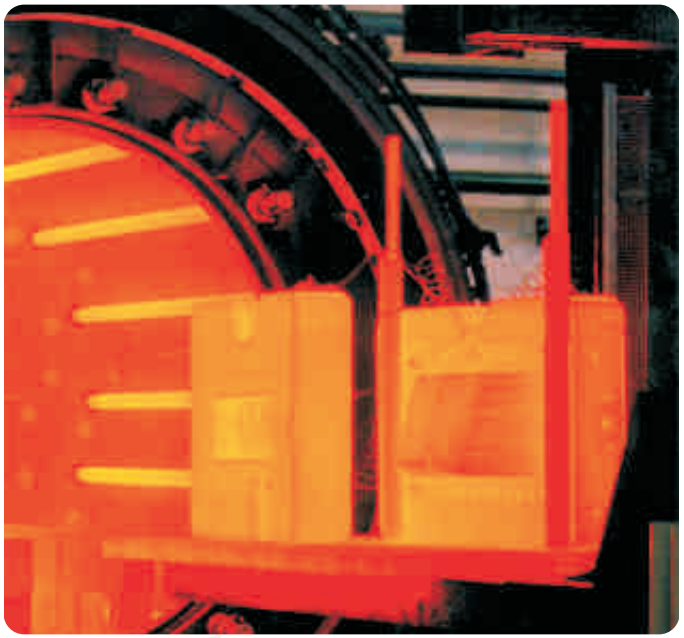


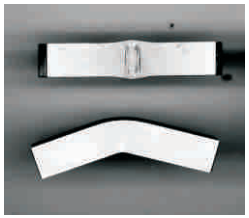
Raffreddamento in bagno di sale a doppio stadio



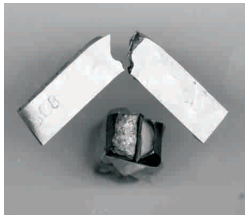
Raffreddamento in gas ad alta pressione (6bar)

Vacuum furnaces, double salt bath quenching: the first bath with thermostated salt at 400°C, the second bath with thermostated salt at 200°C. Thanks to the double step during the cooling phase from the austenitizing temperature to room temperature we can contain the distortion of the pieces and guarantee much more higher values of impact test/toughness.





Unbroken impact test sample.
Very good toughness.



Broken impact test sample.
Bad toughness.

Salt Bath Quenching

T.T.N. GROUP

Registrazione No.: 050202

Intertek

Si attesta che

T.T.N. S.p.A.

Trattamenti Termici Nervianesi

con sede in: Via I Maggio 30 – 20014 Nerviano (MI)/Ital

opera in conformità al capitolato Böhler QTT/BAC Rev.

quale fornitore qualificato per il servizio:

Trattamento termico

Per gli acciai da utensili e rapidi di cui al punto 1 del capito relativamente agli impianti di tempra e rinvenimento indic nell'allegato del presente attestato

Data di Emissione: 15 ottobre 2013

La validità del presente attestato è subordinata a sorveglianza periodica an al riesame completo con periodicità triennale, oltre che al mantenimento dei controllo periodico indicati nel capitolato Böhler QTT/BAC, revisione co

Intertek Moody Certification Srl

BÖHLER

Registrazione No.: 1215859

Intertek

Si attesta che

T.T.N. S.p.A.

Con sede in: Via I Maggio 30 – 20014 Nerviano (

opera in conformità al Capitolato Uddeholm QTT/U

quale fornitore qualificato per il servizio

Trattamento termico

Per gli acciai da utensili e rapidi di cui al punto 1 de relativamente agli impianti di tempra e rinvenimen nell'allegato del presente attestato

Data di Emissione: 15 ottobre 2013

La validità del presente attestato è subordinata a sorveglianza peri al riesame completo con periodicità triennale, oltre che al mantenim controllo periodico indicati nel capitolato Uddeholm QTT/UAC, re

Intertek Moody Certification Srl

UDDEHOLM

COGNE

Cogne Acciai Speciali
Via Paravera,16
11100 Aosta
Tel: +39 0165 3021
Fax: +39 0165 43779

QUA/UTE/04/2002

Spett.le T.T.N. S.p.A.
Trattamenti Termici Ne
20014 NERVIANO
(MI)

OGGETTO: Attestato di qualificazione fornitore

Con la presente portiamo a conoscenza che la nostra Azienda, in data 06/05/2002, ha c

"T.T.N." S.p.A.

sulla base dell'esito dell'Audit, svolto in data 23/04/2002 dai Sigg Regina e Perrone all dei dei Sigg. Pirovano e Ponta, nel corso del quale sono state verificate le capacità tecn organizzative dell'Azienda.

In particolare la "T.T.N." S.p.A. viene qualificata per il Trattamento Termico degli acc utensili di produzione Cogne per lavorazione a caldo (tipo UD12, UD14, UPKR, UR16 ecc…), per lavorazioni a freddo (tipo UK13, UK20, UM12, UN20 ecc…) e per materi (tipo UES42, ecc…).

E' inoltre qualificata per effettuare i seguenti controlli e collaudi:
Composizione chimica, durezza, microstruttura, microporezza, liquidi penetranti, Colla

Cordiali Saluti

Aosta 24/05/2002
U. Regina
R. Perrone

Marco Farinet
(Resp. Servizio Qualità)

AUBERT & DUVAL ITALIA srl
Viale Leonardo da Vinci n. 97
20090 TREZZANO SUL NAVIGLIO (MI)
Tel. 02.484263.1 - Fax 02.48401344
Partita I.V.A. 11975640159

Milano 22 Maggio 2007

Spett.le Società T.T.N Direzione
C.A Dott.Marco Pirovano
Sede di Nerviano
PC Soc. T.T.N Veneto
Nervesa Della Battaglia

Prima di tutto mi scuso per il ritardo con cui Vi trasmetto la certificazione di omologazione della Vs di Nervesa Della Battaglia .
Ciò è dovuto al fatto che i carichi di lavoro dei ns laboratori di certificazione di
Les Ancizes, in questo periodo sono veramente oberati di lavoro e.....di problemi di sovraccarico dello stesso.
Detto ciò Vi trasmetto qui unita l'analisi dei risultati del Trattamento Termico eseguito dalla Vs di Nervesa Della Battaglia:

DAO 06-6035 T 440 80

	assi	Rm N/mm2	Rp0,2% N/mm2	Abt %	Z %	KCV J/cm2
12,5 mm skin	L	1543	1337	14,3	50	37/38
	T	1547	1332	13,6	55	36/36
mi-rayon	L	1546	1324	14,6	56	37/39
	T	1545	1341	13,1	48	37/36

Grain taille 9
Caractéristique mécanique satisfaisante tant en structure,dureté et essai mécanique

Alla luce di questi valori, consideriamo la Vs Società di Nervesa Della Battaglia atta a trattare correttamente tutti i ns acciai al 5 % di Cr. Vi ricordiamo altresì che ci riserviamo in ogn momento la facoltà di controllare il Vs operato su qualsiasi prodotto o pezzo costruito in Acciai Aubert&Duval e inviato ai Vs stabilimenti per il Trattamento Termico Questo nonostante l'omologazione in atto che Vi ricordiamo avrà sempre durata annuale e porta il numero: Dao 06-6035 T 440 80

Tanto Vi dovevamo e cordi l'occasione
Pregiamo i ns più distinti saluti.

Fulvio Piana
Resp.le Aubert&Duval Italia
Acciai da Utensili e Da stampi

KIND&CO EDELSTAHLWERK

GEGR. 1888

Dominial

WERKZEUGSTAHLE • SONDERLEGIERUNGEN
ROST- UND SÄUREBESTÄNDIGE EDELSTAHLE

KIND & CO. EDELSTAHLWERK, Postfach 2160, 57462 Olpe

T.T.N. Spa
Treatments&Plants Responsible
Mr Dott. Marco Pirovano
V.le 1° Maggio, 30

I – 20014 Nerviano (MI)

Von: Dieter Deterding
Unser Zeichen: Deterding/Ue
Tel.: +49(0)2262 84 -225
Fax.: +49(0)2262 84 -152
Mail: Dieter.Deterding@kind-co.de
Datum: Mittwoch, 1. Juni 2005

Heat treatment of hot-work tool steels

Dear Mr Dott. Marco Pirovano,

We are glad to confirm that the heat treatment facilities of your company -furnaces, staff, testing as well as laboratory equipment - allow you to heat treat our hot-work tool steels according to our and international specifications.

Kind & Co and TTN Group will be exchanging each other technical know-how and experience in order to reach best properties at critical tooling produced with Kind & Co steel grades.

Kind & Co has approved TTN Group for heat treating Kind & Co.'s material.

Best regards,
KIND&CO
EDELSTAHLWERK
[General Manager
of Quality Management]

Certifications

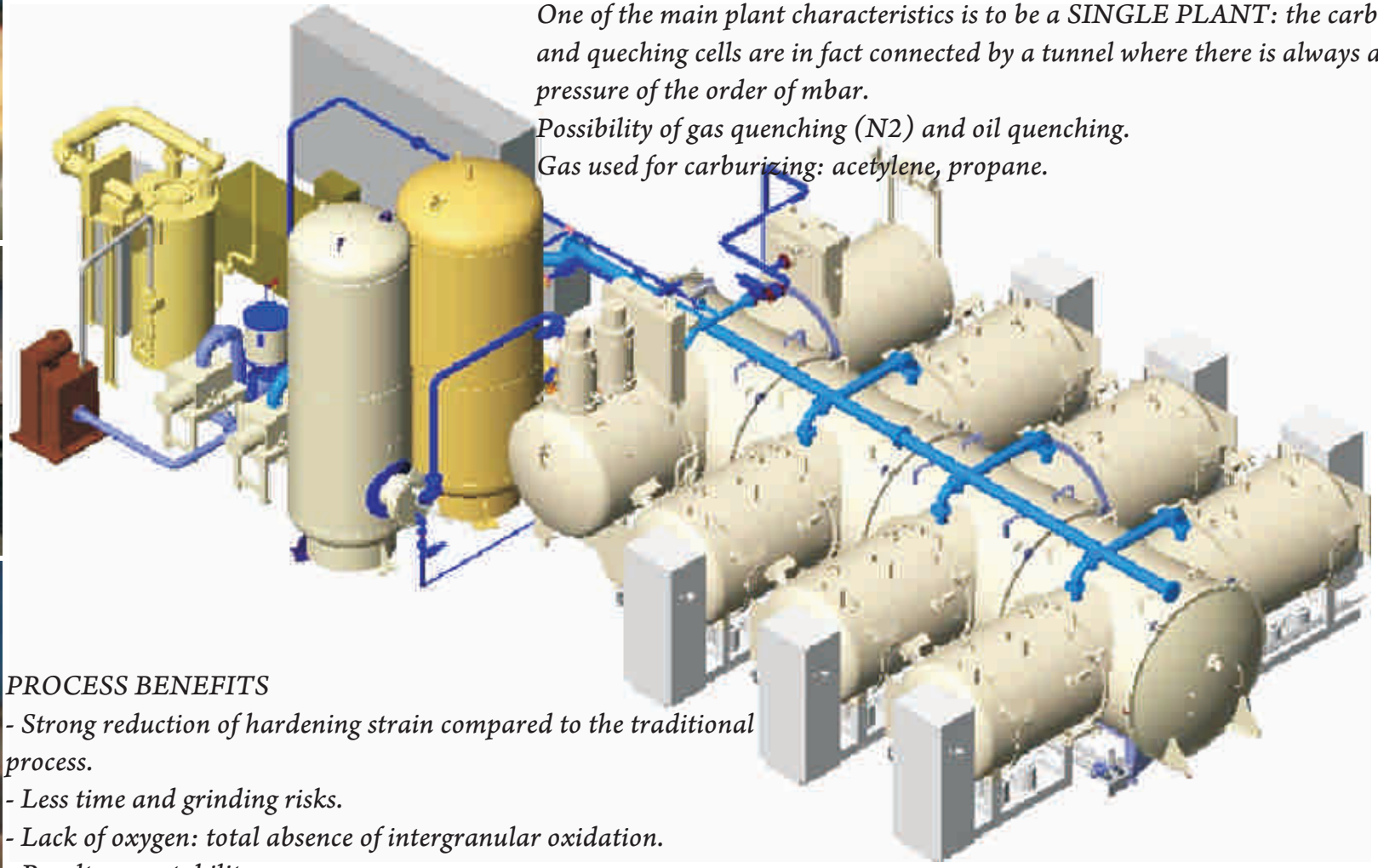
T.T.N. GROUP

Controlled atmosphere plants up to Ø4000x4000mm dedicated to the thermochemical heat treatments on big dimensions pieces, whose management is governed entirely by a central software.
Uniformity of temperature in the ovens.
Synchronous balancing, in real time, of the grow up and maintenance phases through a temperature mapping on the entire volume.

Carburizing

T.T.N. GROUP - Via I Maggio,30 - 20014 Nerviano (MI) www.ttnspa.it

T.T.N. GROUP



PLANT CHARACTERISTICS

One of the main plant characteristics is to be a SINGLE PLANT: the carburizing and quecheing cells are in fact connected by a tunnel where there is always a partial pressure of the order of mbar.

Possibility of gas quenching (N2) and oil quenching.

Gas used for carburizing: acetylene, propane.

PROCESS BENEFITS

- Strong reduction of hardening strain compared to the traditional process.

- Less time and grinding risks.

- Lack of oxygen: total absence of intergranular oxidation.

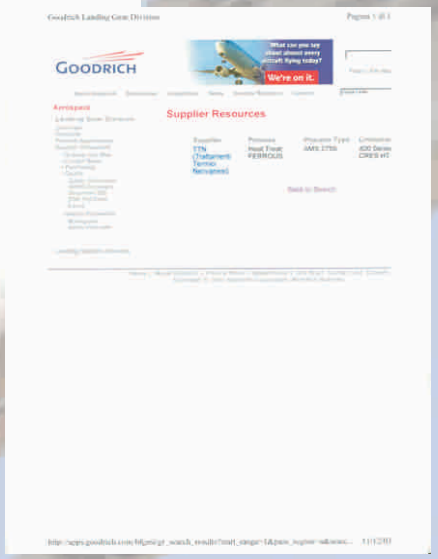
- Results repeatability.

Low Pressure Carburizing

T.T.N. GROUP


DICHIARAZIONE DI APPROVAZIONE
STATEMENT OF APPROVAL
N° A/1224
TRATTAMENTI TERMICI NERVIANESI S.p.A.
480-MAP (Trattamenti macchinate)
30 Luglio 2004
AGUSTA

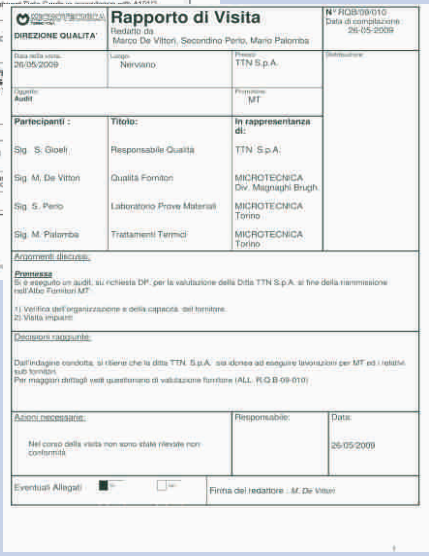

Alenia
Delta II 2nd Stage Tank
BOEING
Heat treatment requirements
BOEING | ALENIA SPAZIO | TTN
Specifications | AMS 5505 STP0429 rev.L | AMS 5505 STP0429 rev.L | AMS 5505 STP0429 rev.L PT0083 rev.4
Procedure | - | - | -


GOODRICH
Supplier Resources


OTO Melara
TTN
TEAM INDUSTRIAL SERVICES
TECHMETALS, INC.


AleniaAermacchi
661/218
29 Settembre 2011
Spett.le
T.T.N. S.p.a
Via I° Maggio
20014 NERVIANO (MI)
ITALIA
OGGETTO: APPROVAZIONE FORNITORE n°A80/2011


Avio Aero
ATTESTATO DI QUALIFICAZIONE DI IMPIANTO/APPARECCHIATURA UTILIZZATO NEI PROCESSI SPECIALI ESEGUITI PRESSO I FORNITORI
(QUALIFICATION OF SPECIAL PROCESS EQUIPMENT/MACHINE AT EXTERNAL SOURCE)
PROCESSO SPECIALE (SPECIAL PROCESS): HEAT TREATMENT OF STEEL ALLOYS; HEAT TREATMENT OF Ni/Co ALLOYS
NORME APPLICABILI (APPLICABLE SPECIFICATIONS): AMS2750, AMS2759, 6000F, 4101Q, 6507F15
FORNITORE (EXTERNAL SOURCE): TTN, Trattamenti Termici Nervianesi, Via Primo Maggio, 30, 20014 Nervano (MI)
IDENTIFICAZIONE IMPIANTO/APPARECCHIATURA
(EQUIPMENT/MACHINE IDENTIFICATION)
Equipments BP-1, BP-2, CF-1, CF-2
DATA SCADENZA (EXPIRATION DATE): 31 Dicembre 2016
LIMITAZIONI (RESTRICTIONS):
MOTIVO DELLA QUALIFICAZIONE (QUALIFICATION REASON): PERIODIC
LA PRESENTE QUALIFICAZIONE VI EVIDENZE CONTENUTE NELLA SEG (THIS QUALIFICATION IS RELEASED ON T
SCHEDE TECNICHE DI PROCESSO (SPECIAL PROCESS DATA CARDS)
RELAZIONE TECNICA TO.PS.F.004.13 (TECHNICAL REPORT)
DATA (DATE)
RESPONSABILE LABORATORI E PROCESSI SPECIALI (HEAD OF LABORATORIES AND SPECIAL PROC


Rapporto di Visita
Redatto da: Marco De Vittori, Secondino Perlo, Mario Palomba
N° RQB/09/010
Data di compilazione 26-05-2009
DIREZIONE QUALITA'
Data della visita: 26/05/2009
Luogo: Nervano
Presso: TTN S.p.A.
Oggetto: Audit
Provenienza: MT
Partecipanti: / Titolo: / In rappresentanza di:
Sig. S. Gioeli — Responsabile Qualità — TTN S.p.A.
Sig. M. De Vittori — Qualità Fornitori — MICROTECNICA Div. Magnaghi Brugh
Sig. S. Perlo — Laboratorio Prove Materiali — MICROTECNICA Torino
Sig. M. Palomba — Trattamenti Termici — MICROTECNICA Torino
Argomenti discussi:
Premessa
Si è eseguito un audit, su richiesta DP, per la valutazione della Ditta TTN S.p.A. al fine della riammissione nell'Albo Fornitori MT
1) Verifica dell'organizzazione e della capacità del fornitore.
2) Visita impianti
Decisioni rapporate:
Dall'indagine condotta, si rileva che la ditta TTN. S.p.A. sia idonea ad eseguire lavorazioni per MT ed i relativi sub fornitori
Per maggiori dettagli vedi questionario di validazione fornitore (ALL. R.Q.B 09-010)
Azioni necessarie: Nel corso della visita non sono stati rilevati non conformità
Responsabile:
Data: 26-05-2009
Eventuali Allegati:
Firma del redattore: M. De Vittori

Aerospace Division Qualified Heat Treatments

Normalizing
Quenching and Tempering
Solution Annealing
Ageing
Stress Relieving

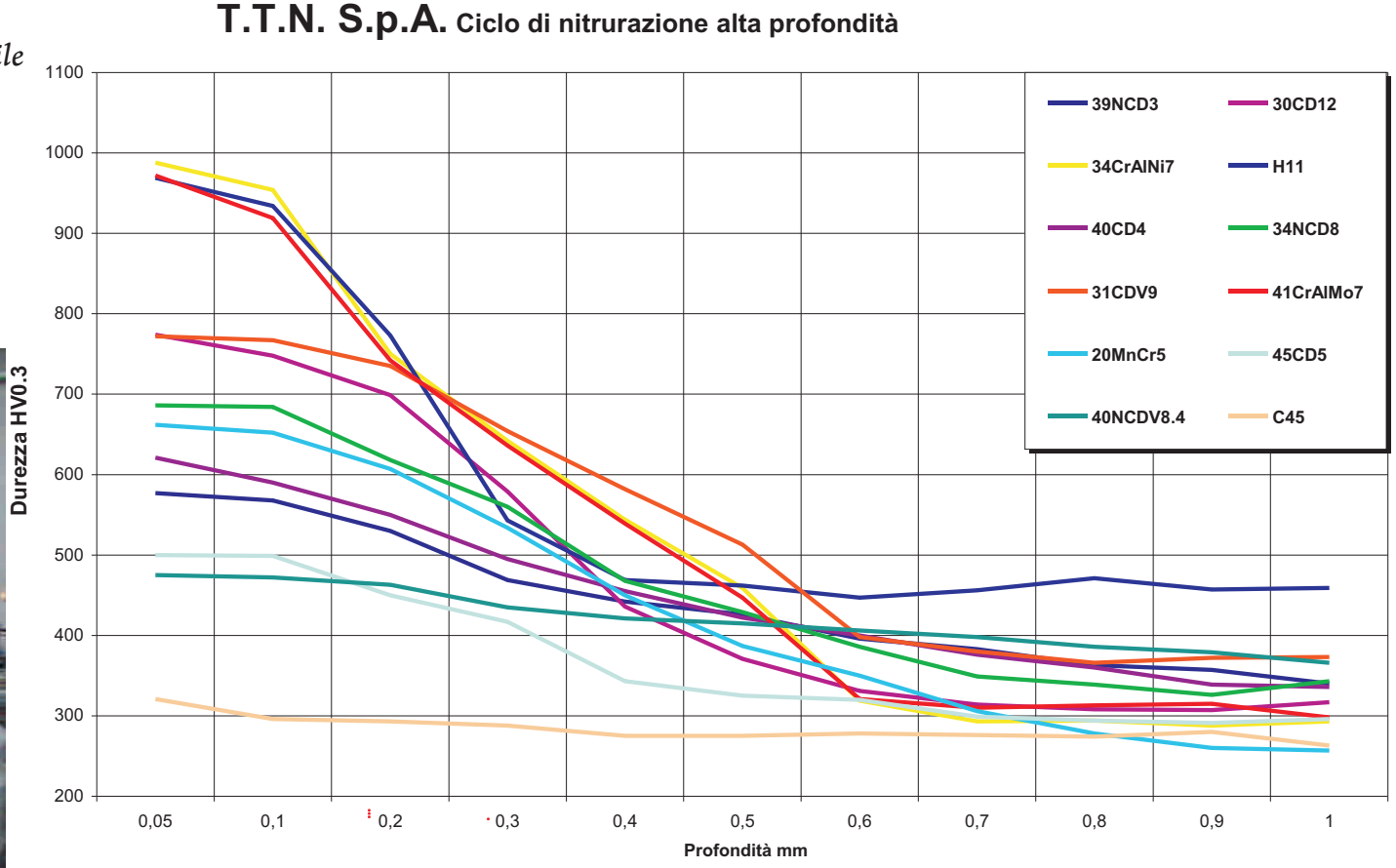
STEELS, SUPERALLOYS AND NON FERROUS ALLOYS

Aerospace Division

T.T.N. GROUP

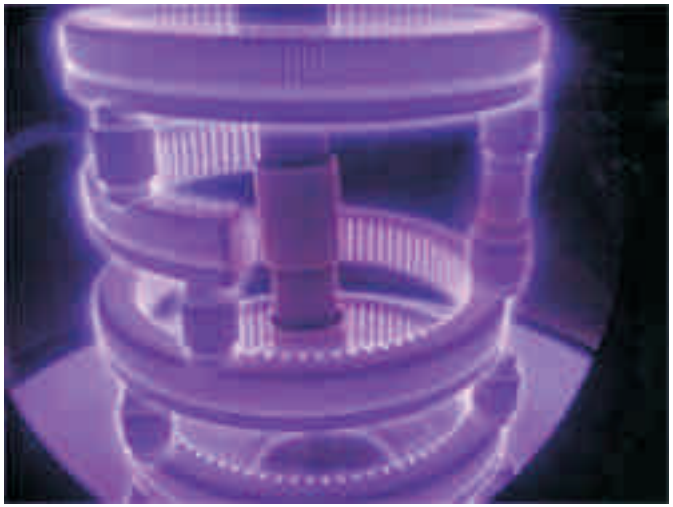
Example of 72hours nitriding cycle hardness profile for the most used nitriding steels.
It is reported, in the graph, HV hardness in function of hardening thickness [mm].

Gas Nitriding plants, dimensions up to:
Ø4000 x 4000 mm
Ø1200 x 10000 mm
max 20 ton

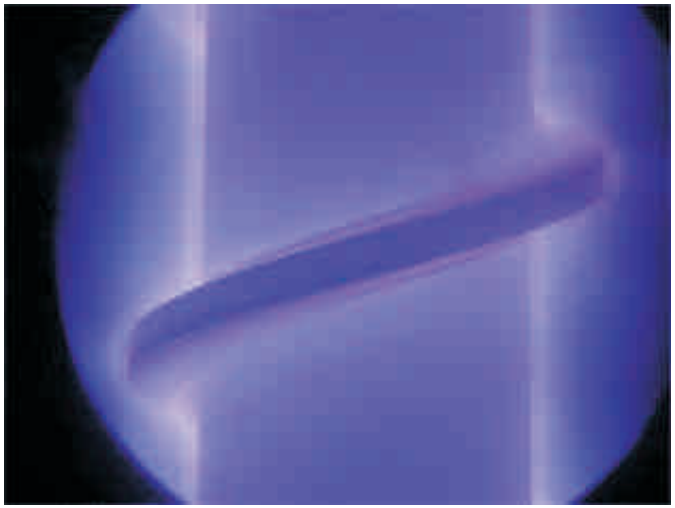


Gas Nitriding

T.T.N. GROUP



The sectors targeted by the nitriding, nitrocarburizing or ion oxidation are those for which it is necessary to obtain parts with hardened surface for the first 0.05-1mm without sacrificing the toughness of the layer or risking phenomena of spalling, fracture, cracking and broken edges.
The reason for the slight, but constant and generalized for all steels, surface hardness increase in the process is due to the energy which the plasma gives as electric field to the nitrogen and hydrogen ionized particles.



Plasma Nitriding

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Nipre® is a thermochemical heat treatment made of nitriding and post-oxidation phases. The main goal of this treatment is to improve the mechanical properties of the surface of steel and, consequently, of the performances directly connected to the behavior of those areas: typically creep and wear resistance, for mechanical properties, corrosion resistance for chemical and electrochemical phenomena.

Cylinders in 39NiCrMo3 for off-shore oil industry machines, currently operating in the North Sea. The columns, that have a length of 6500 mm, were subjected to the process Nipre®; after 5 years, operating in marine environment, the cylinders are free from defects.

Example of Nipre on a machine tool chuck in C40: it is clear the difference, in terms of rust resistance caused by the cooling liquid used.

Nipre® on oil dynamics cylinder in C40 Ra: 0,2 µm used to reduce friction coefficient and increase wear resistance.

Nipre® Piston 38NiCrMo4
Nipre® weight 35 ton.

Nipre®

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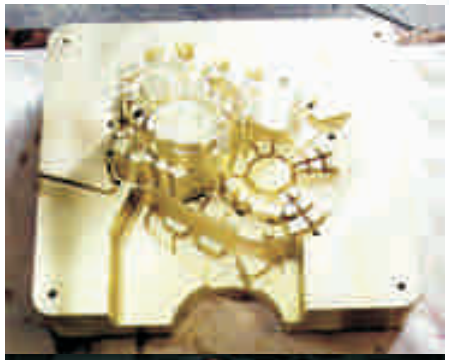

Full range for hard and lubricant PVD-CVD coatings

A concrete solution...

...to your wear and functionality problems.

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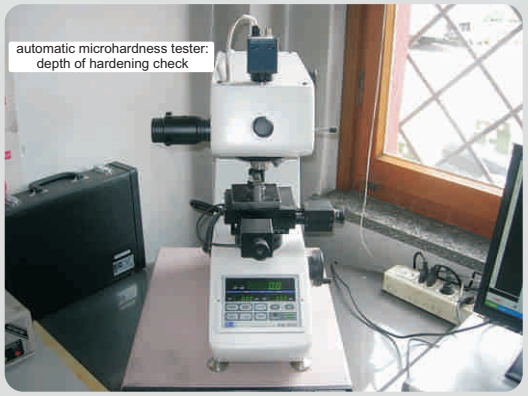

automatic microhardness tester: depth of hardening check


microhardness check


Optical Microscope: metallografic inspection

after solidification

The sample taken from the container

The sample after polish

Cold Tool Steel

X 1000

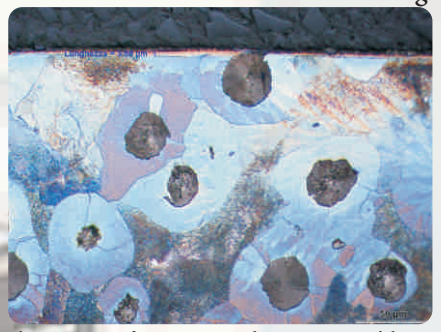
Groesbeck: Cr and Mo ledeburitic complex carbides

34CrAlNi7-10 nitroxidation

X 1000

Nital: iron oxide Fe3O4, thickness 9mm and tempered martensite

Globular Cast Iron Plasma Nitriding

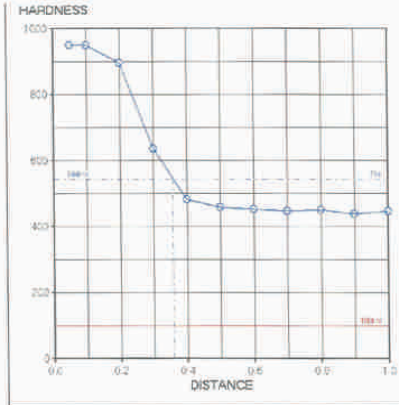


X 500

Nital: Layer of compounds 3-4 mm / lamellar perlite, ferrite and globular graphite

33CrMoV12-9 Profile of hardening after gas nitriding

mm	HV
0.050	949.33
0.100	949.33
0.200	895.54
0.300	634.81
0.400	481.36
0.500	456.67
0.600	450.47
0.700	444.42
0.800	449.26
0.900	437.31
1.000	444.42



Nht/+100 core = 0.359mm
Durezza 960 Hv1

Laboratory

T.T.N. GROUP

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