

introduction to the company



Group Organisation by Division



ERAMET

ERAMET

Employees : 13 550 *
Turnover M€ : 2 287 *

**ERAMET
ALLIAGES**

Employees : 5 327
Turnover M€ : 778

**ERAMET
MANGANESE**

Employees : 5 698
Turnover M€ : 953

**ERAMET
NICKEL**

Employees : 2 346
Turnover M€ : 564

* hors SMC

ALLIAGES DIVISION



ERAMET ALLIAGES

38,5 %

SPECIAL METALS
CORPORATION

Employees : 3299
Turnover M€ : 814

AUBERT & DUVAL
Holding

Employees : 3769
Turnover M€ : 608*

ERASTEEL

Employees : 1094
Turnover M€ : 178

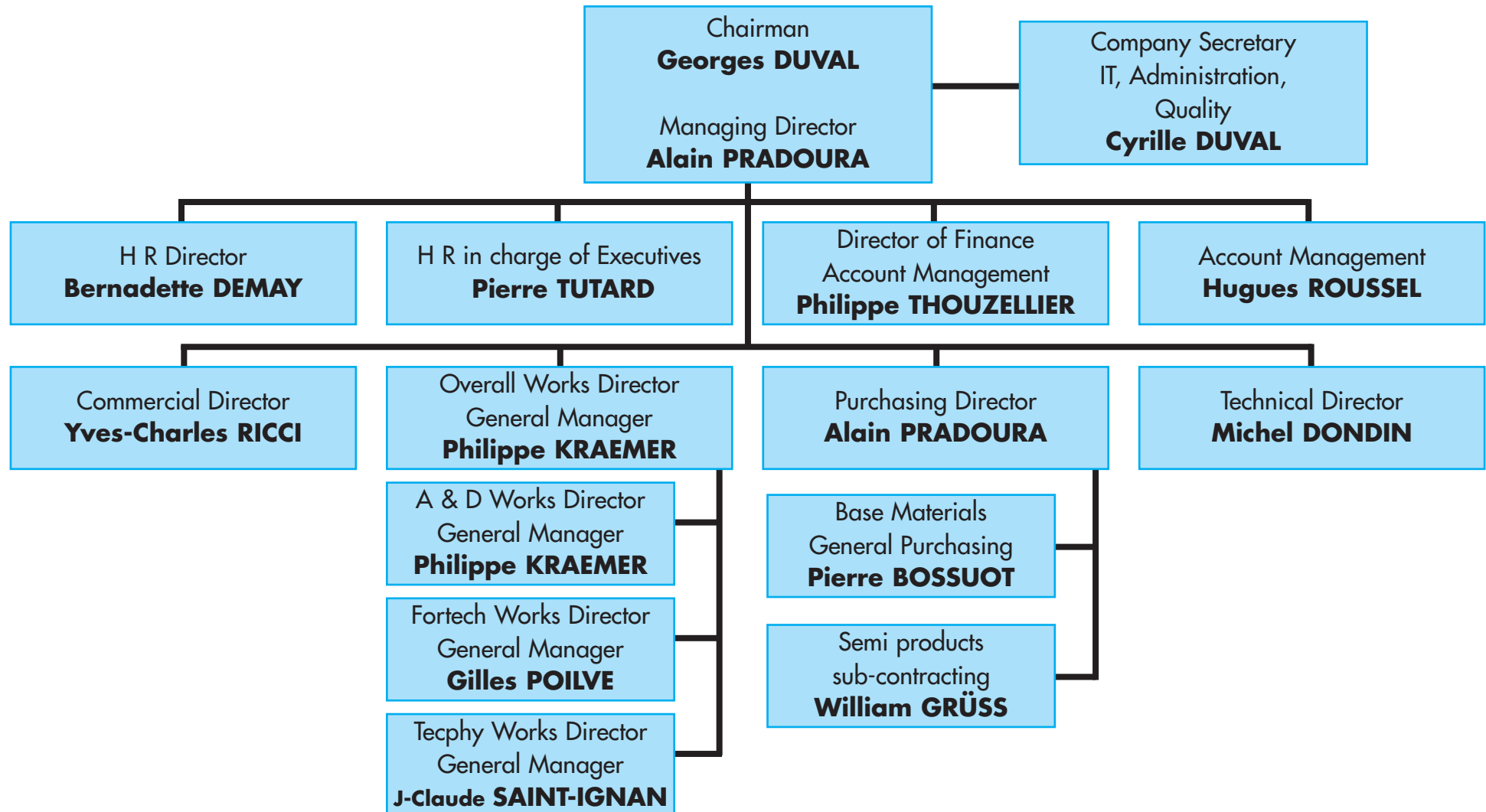
AUBERT & DUVAL
Alliages

AUBERT & DUVAL
Fortech

AUBERT & DUVAL
Tecphy

* 2001

ORGANIZATION



GROUP SITES



AGENCIES AND DISTRIBUTION CENTRES IN FRANCE

AUBERT&DUVAL
HOLDING



A.G: Agencies
D.C: Distribution Centres

**EUROPEAN SALES
NETWORK**

AUBERT&DUVAL
AD HOLDING



WORLDWIDE SALES NETWORK

AUBERT&DUVAL
AD HOLDING



OUR BUSINESS



to design, melt, manufacture and market metallurgical products of high mechanical properties in steels, super alloys, aluminium alloys and titanium .

Our melting facilities (melting shop, re-melting, powder atomisation), our conversion processes (open and closed-die forging, stamping, foundry, hot-rolling, heat treatment, machining and testing), and our powder metallurgy (HIP) allow us to meet the requirements of all high technological industries : aerospace and space, defence, power generation, automotive, transport, tooling, medical, mechanical construction...

OUR POSITION ON THE WORLD MARKET

AUBERT&DUVAL
AD HOLDING

ONE OF THE FIRST
WORLD PRODUCERS

WORLD LEADER

WORLD LEADER

2ND CLOSE DIE FORGER

2ND CLOSE DIE FORGER

3RD CLOSE DIE FORGER

EUROPEAN LEADER

EUROPEAN LEADER

SUPERALLOYS, NICKEL BASE
ALLOYS, HIGH PERFORMANCES
SPECIAL STEELS

POWER GENERATION

CLOSE DIE FORGING
LARGE ALUMINIUM COMPONENTS

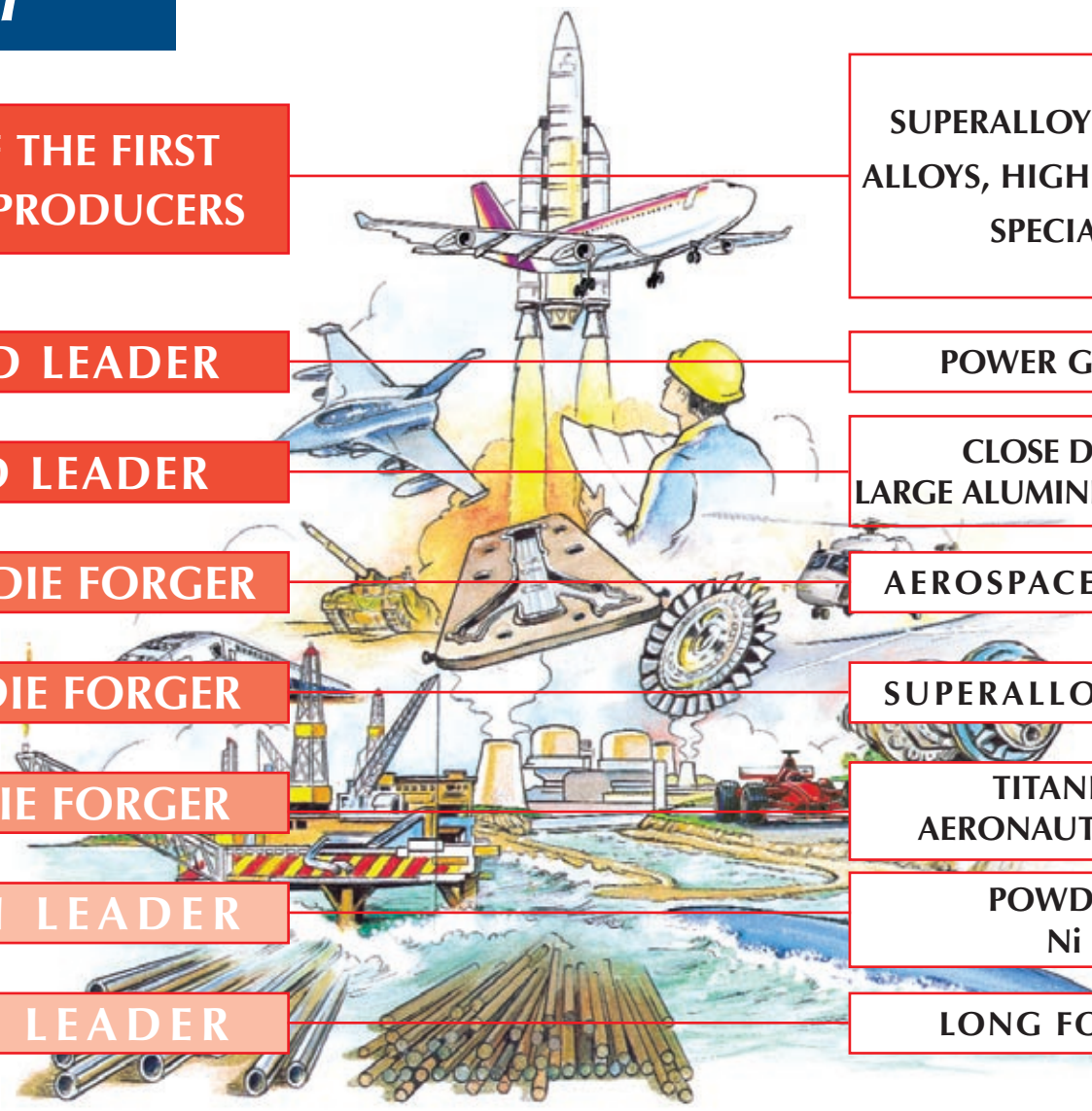
AEROSPACE COMPONENTS

SUPERALLOYS COMPONENTS

TITANIUM AND STEEL
AERONAUTICAL COMPONENTS

POWDER METALLURGY
Ni BASE ALLOYS

LONG FORGED PRODUCTS



EMPLOYEES & TURNOVER



	TOTAL
EMPLOYEES 31.12.2001	3769
TURNOVER M€ - 2001	Consolidated Turnover ≈ 608
FORECAST TURNOVER M€ - 2002	Consolidated Turnover ≈ 592

PRODUCTION FACILITIES



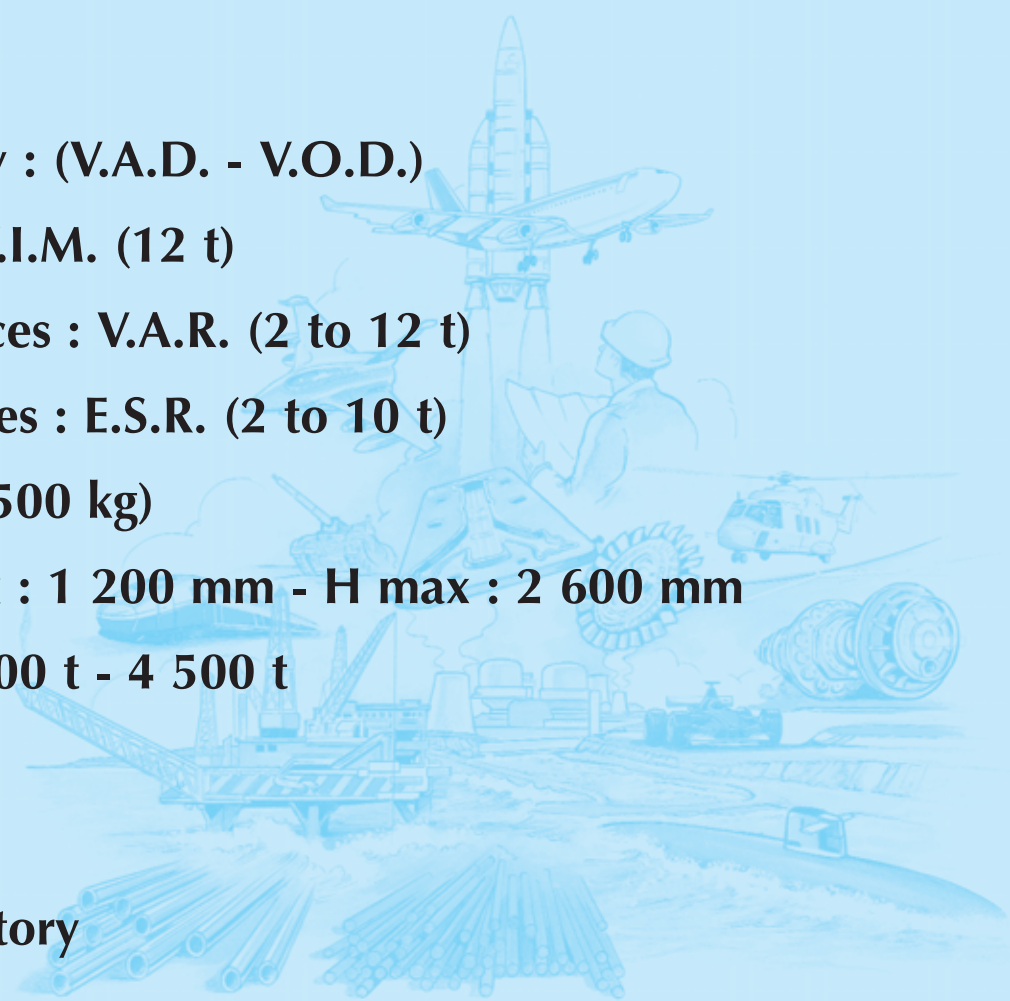
- 3 arc furnaces from 40 t to 70 t
- Ladle metallurgy and Vacuum steel degassing
- 3 Secondary melting installations
- 3 Vacuum induction melting furnace (V.I.M.) from 2 t to 12 t
- 5 Electro slag remelting furnaces (E.S.R.) - up to 25 t
- 9 Vacuum arc remelting furnaces (V.A.R.) - up to 30 t
- Atomisation towers
- Hot isostatic pressing
- Foundry (moulding and centrifugal)
- 9 Forging press from 1 200 t to 4 500 t
- Continuous 4 hammer forging machine → \varnothing 50 mm to 350 mm *diameter bars*
 \square 40 mm to 300 mm *flats or squares*
- Hot rolling - blooming - large rolling mill : 52 to 200 mm
- small rolling mill : 7 to 52 mm
- 9 Hammers : from 3 000 kgm to 36 000 kgm
- 5 Closed die presses : from 4 500 t to 65 000 t
- Heat treatment facilities
- Bar completion shops
- Machine shops for forged parts
- Laboratories, testing and inspection

PRODUCTION FACILITIES

- Arc furnaces : 40 t - 60 t
- Affinage AOD
- Ladle metallurgy and vacuum steel degassing
- 2 Vacuum induction melting furnaces (VIM) : 2 t - 10 t
- 3 Electro slag remelting furnaces (ESR) - up to 25 t
- 6 Vacuum arc remelting furnaces (VAR) - up to 30 t
- Foundry (moulding and centrifugal)
- Forging press : 4 500 t - 2 500 t
- Continuous forging machine
- 3 Hammers : 3 000 kgm to 36 000 kgm
- Hot rolling - blooming - large rolling mill : 52 to 200 mm
- small rolling mill : 7 to 52 mm
- Heat treatment
- Machining shops
- Inspection and Testing Laboratory

PRODUCTION FACILITIES

- Arc Furnace : 44 t
- Vacuum Secondary Metallurgy : (V.A.D. - V.O.D.)
- Vacuum Induction Melting : V.I.M. (12 t)
- Vacuum Arc Remelting Furnaces : V.A.R. (2 to 12 t)
- Electro Slag Remelting Furnaces : E.S.R. (2 to 10 t)
- Atomization Towers (35 to 1 500 kg)
- Hot Isostatic Pressing : Ø max : 1 200 mm - H max : 2 600 mm
- Forging Presses : 1 700 t - 2 000 t - 4 500 t
- Heat Treatment
- Machining Shops
- Inspection and Testing Laboratory



PRODUCTION FACILITIES



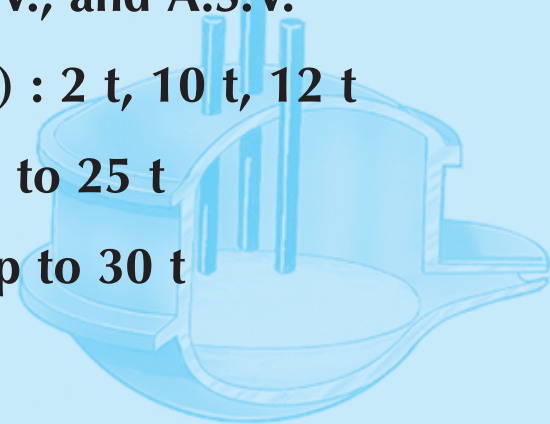
- ESR Remelt Furnaces
 - 4 Open Die Presses : 1 200 t, 2 500 t, 2 700 t, 3 000 t
 - 5 Closed Die Presses : 4 600 t, 10 000 t, 20 000 t, 22 000 t, 65 000 t
 - 6 Hammers : 3 500 kgm to 60 000 kgm
 - Heat Treatment
 - Finishing
 - Machining
 - Inspection and Testing Laboratories
-
- A light blue background illustration depicting various industrial and manufacturing processes, including a rocket launch, a worker, a train, a helicopter, a car, and various mechanical parts.

PRODUCTION FACILITIES



MELTING REMelTING - FOUNDRY

- 3 Arc furnaces : 40 t, 44 t, 60 t
- Vacuum degassing equipment
- 3 Vacuum secondary metallurgy A.O.D., A.P.V., and A.S.V.
- 3 Vacuum induction melting furnaces (V.I.M.) : 2 t, 10 t, 12 t
- 5 Electro slag remelting furnaces (E.S.R.) : up to 25 t
- 9 Vacuum arc remelting furnaces (V.A.R.) : up to 30 t
- Foundry (moulding and centrifugal casting)

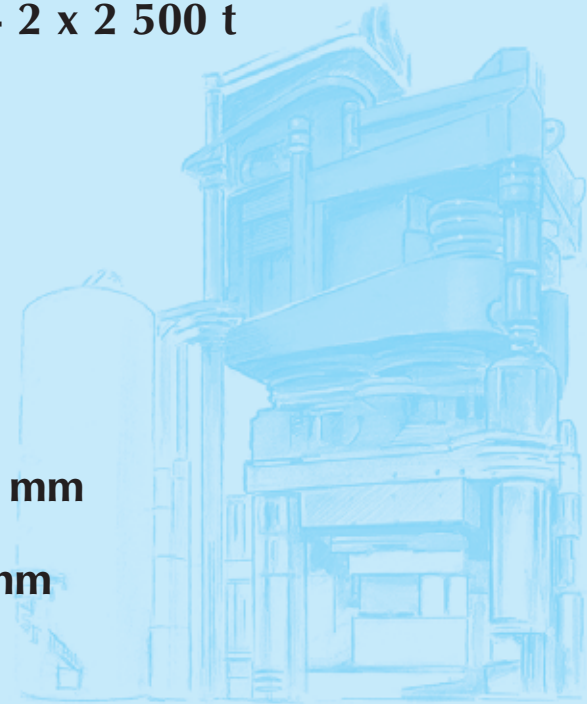


PRODUCTION FACILITIES



HOT PROCESSING

- 9 forging presses : 1 200 t - 1 700 t - 2 000 t - 2 x 2 500 t
2 700 t - 3 000 t - 2 x 4 500 t
- continuous forging machine - 4 heads :
 - \varnothing 50 mm to 350 mm *rounds*
 - \sphericalangle 40 mm to 300 mm *flats or squares*
- rolling mill - blooming - large size : 52 to 200 mm
- small size : 7 to 52 mm
- 9 hammers : 3 500 kgm to 60 000 kgm
- 5 closed die presses : 4 500 t - 10 000 t - 20 000 t - 22 000 t - 65 000 t



POWDER METALLURGY

- **Gas atomization (35 to 1 500 kg)**
- **Hot isostatic pressing (H.I.P.) :**
Ø : 1 200 mm - H : 2600 mm

PRODUCTION FACILITIES

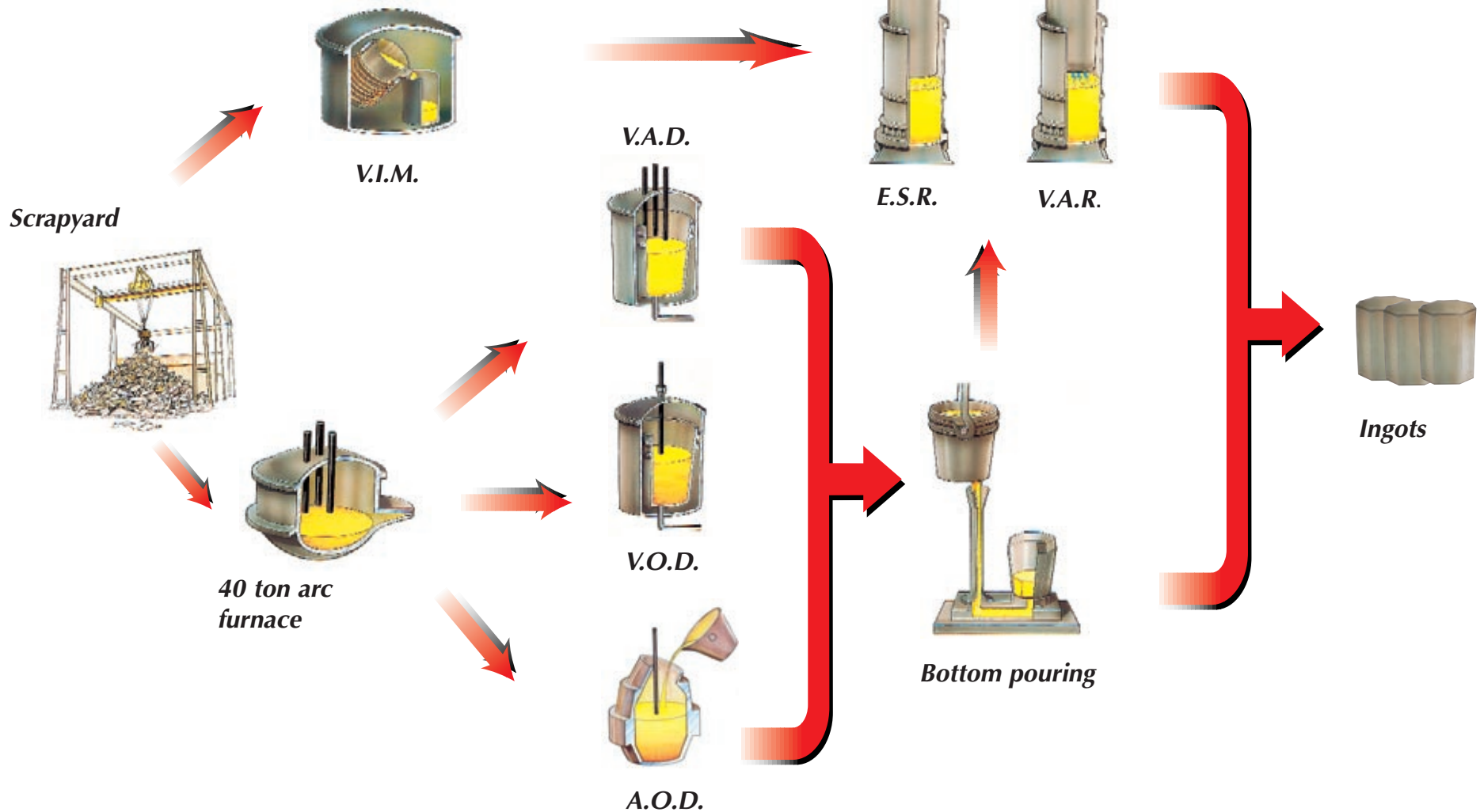


HEAT TREATMENT FINISHING - INSPECTION

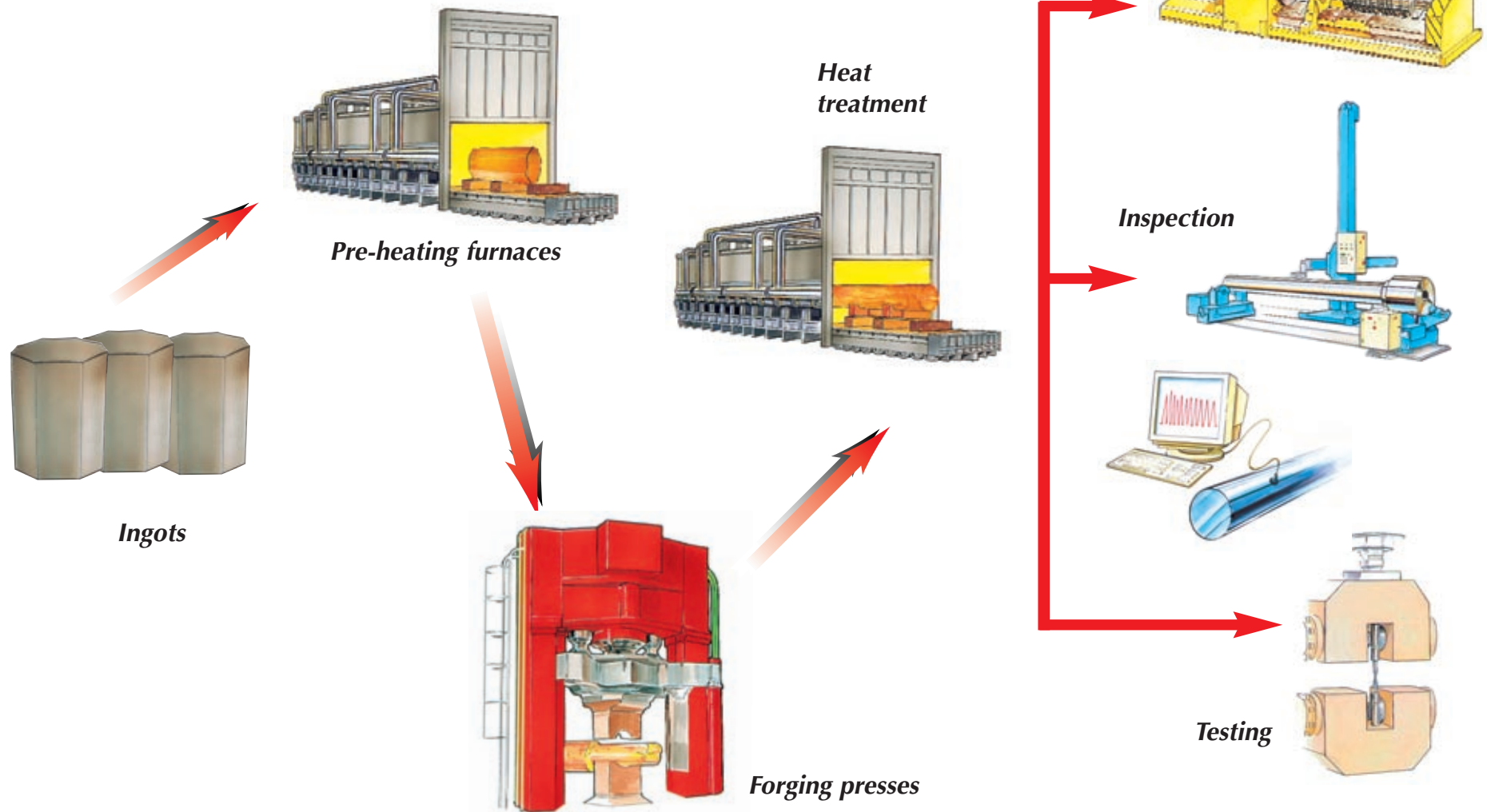
- **Heat treatment shops**
- **Bars finishing**
- **Open and closed die forgings machining**
- **Analysis, testing and inspection laboratories**

MELTING PROCESSES

AUBERT & DUVAL
HOLDING



OPEN DIE FORGING PROCESS



BARS AND SEMI-PRODUCTS PRODUCTION

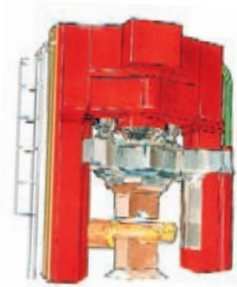
AUBERT & DUVAL
AD HOLDING



Ingots



Pre-heating furnaces



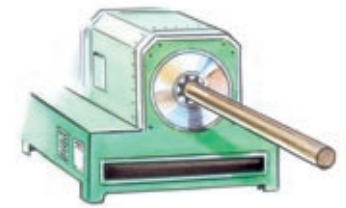
Forging



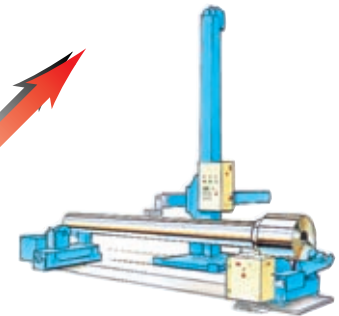
Forging machine



Heat treatment



Peeling



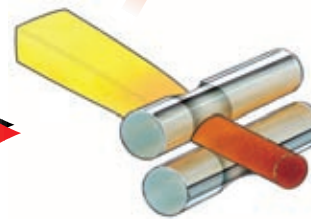
Inspection



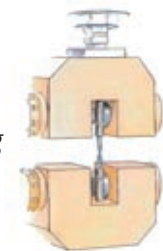
Testing



Blooming

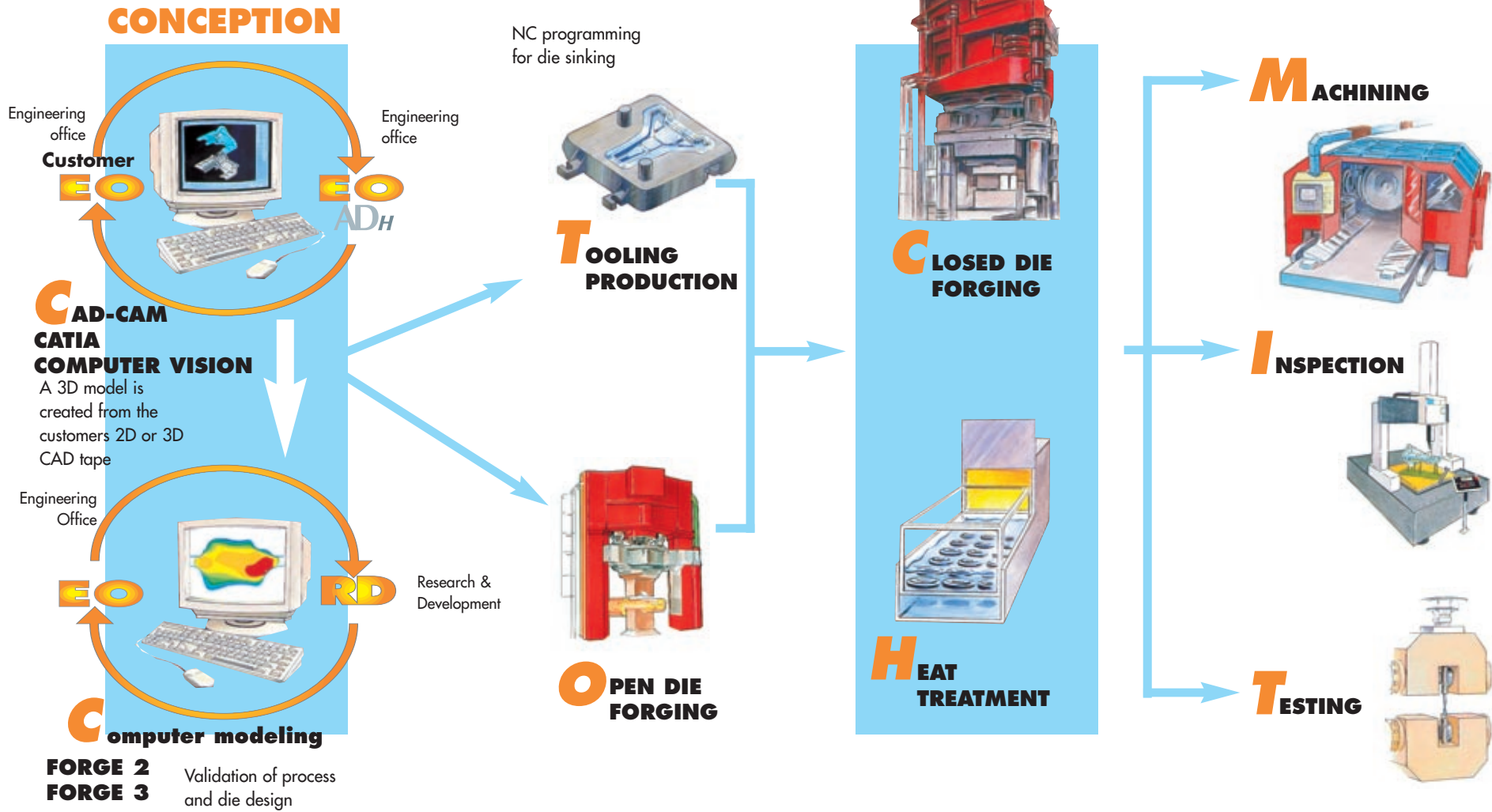


Rolling

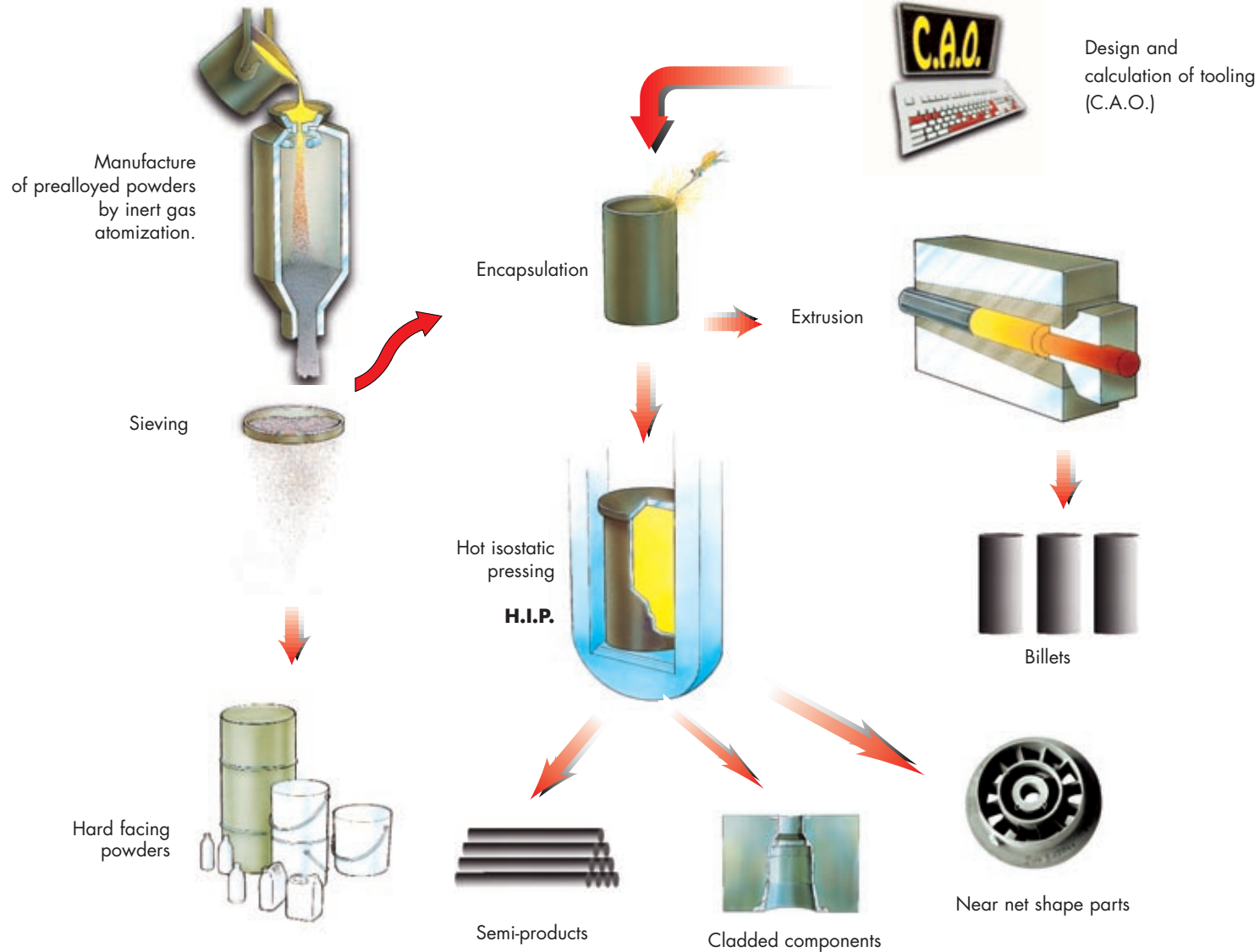


Groupe
ERAMET

OUR PROCESS

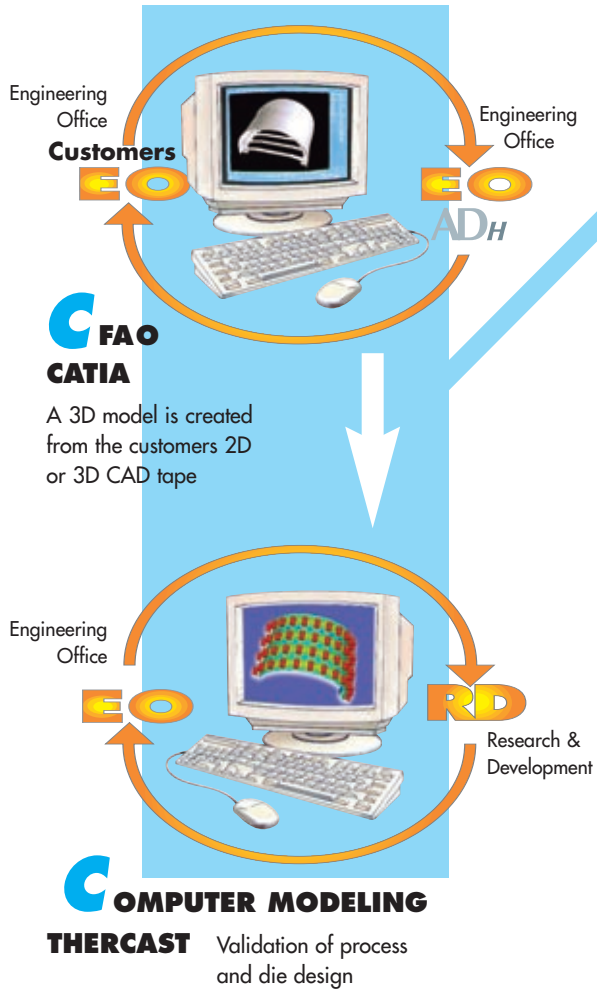


POWDER METALLURGY PROCESS

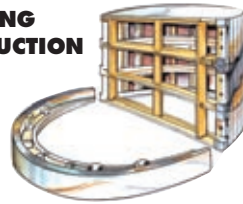


FOUNDRY PROCESS

CONCEPTION



TOOLING PRODUCTION



CASTING

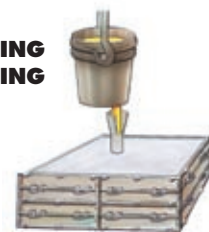


TO CAST

VACUUM MELTING AND CASTING



AIR MELTING AND CASTING



HEAT TREATMENT



FETTLING



KNOCK-OUT

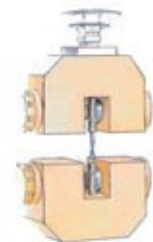
MACHINING



INSPECTION

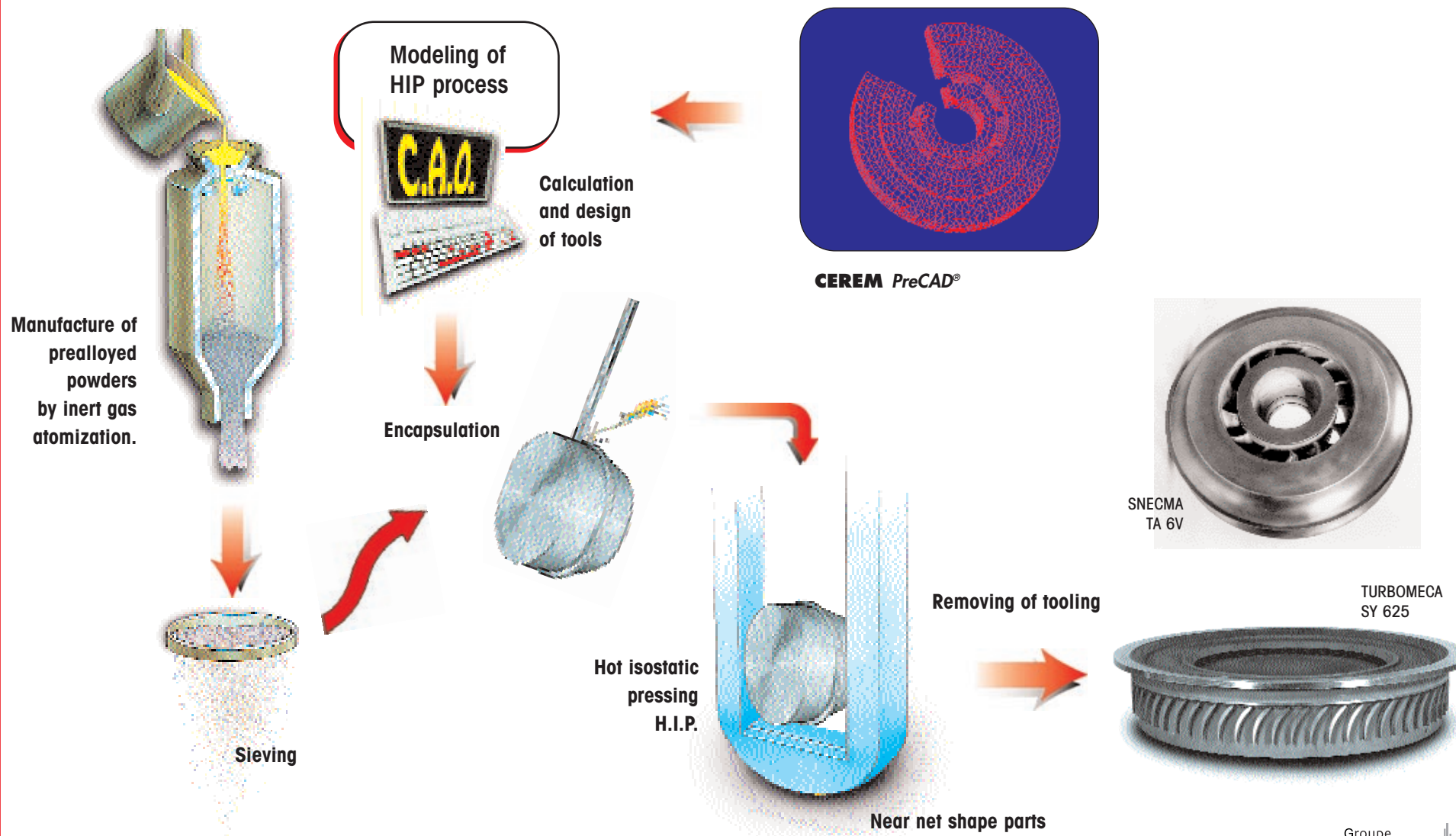


TESTING

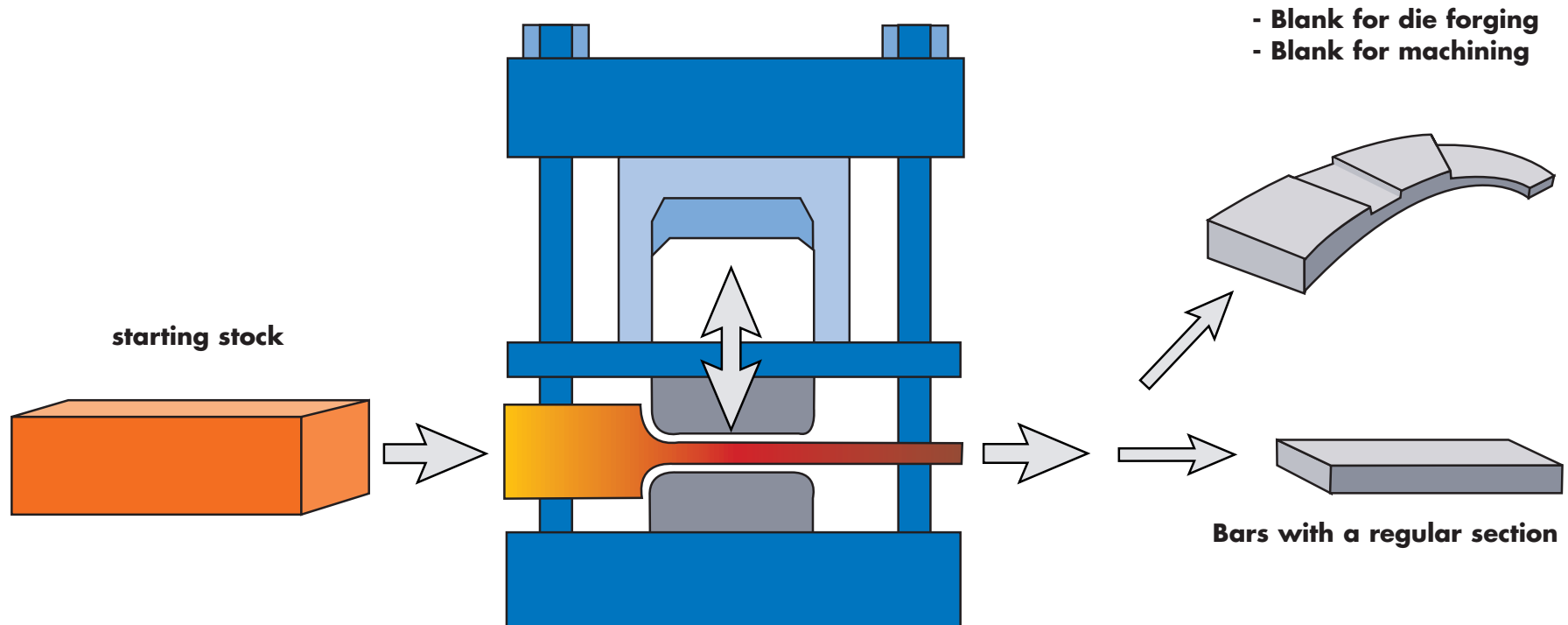


ISOPREC®

AUBERT&DUVAL HOLDING

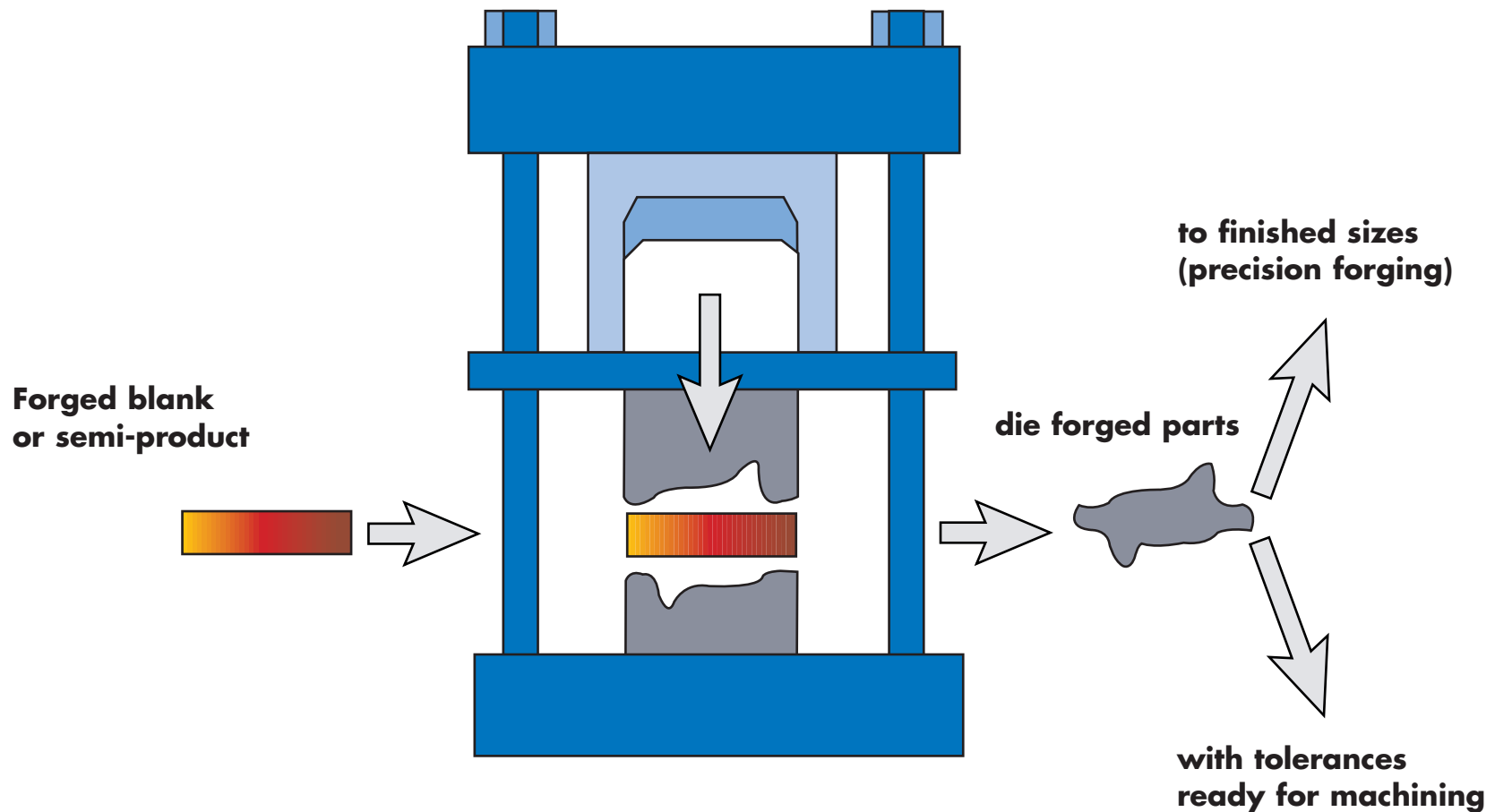


OPEN DIE FORGING



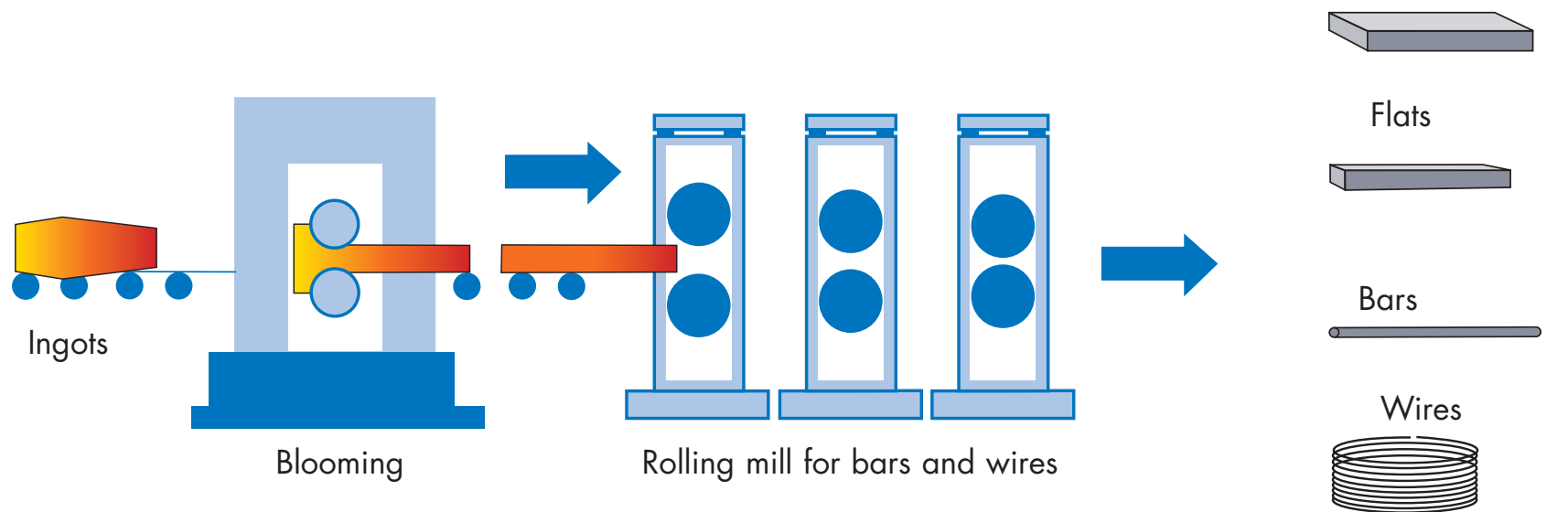
Open die forging is the reshaping of metal using two flat tools.

CLOSED DIE FORGING



Closed die forging is the transformation of a metal blank into a complex shape using 2 dies (in one stroke and also at a slow speed).

ROLLING

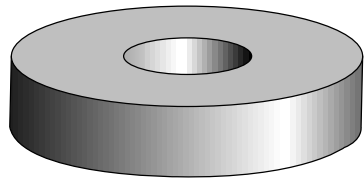


Rolling is the plastic deformation of material between two cylinders

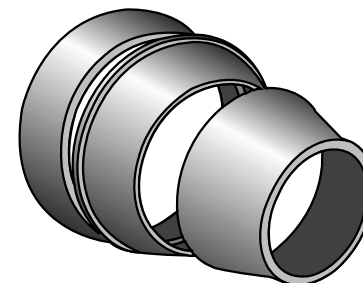
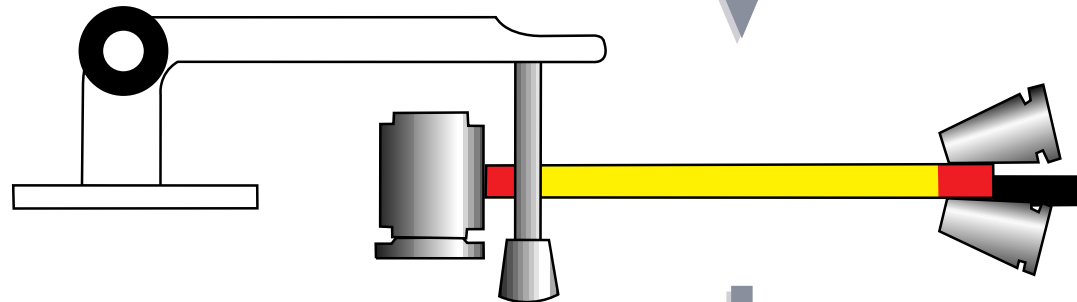
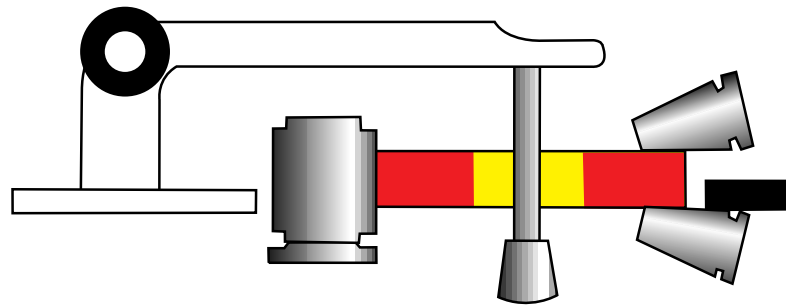
**Constant section
bars, wires and flats**



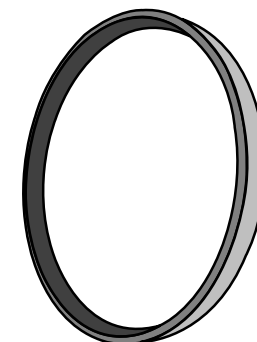
RING ROLLING



forged pre-form



ring forgings



Ring rolling starts with a forged ring and by axial and radial deformation produce a ring.

STRATEGIC DIVISIONS



- Parts division :

Open and closed die forgings in special steel, super alloys, titanium and aluminium alloy... : parts with high mechanical properties and large added value mainly for the aerospace, space, power generation (gas turbine) and defence markets.

- Long Products division :

Long products, semi-products, plate, bars and individual parts for a more divers range of markets (aerospace, nuclear, tooling, automotive and transport, mechanical construction, oil and gas, petrochemical...), these products are also subject to high quality requirements.

MAIN CUSTOMERS



Aeronautic & space : Airbus, BAE SYSTEMS, Boeing, Messier-Dowty, SNECMA, MTU, Pratt & Whitney, BF Goodrich, Rolls-Royce, General Electric, Turbomeca, ASCO, Dassault, Alénia, MHI, IHI, MAN, LAT, Fiat...

Power Generation : General Electric, Alstom, Siemens-Westinghouse...

Defence : Oto-Melara, Giat, Hekler et Koch, Rheinmetal, ODE, Santa Barbara, CMI, DCN...

Nuclear : Jeumont, Framatome, Valinox, Urenco, DSFL...

Tooling : PSA Peugeot Citroën, Renault, Forcast, USX, NSS...

Oil : Shell, ABB, FMC...

Automobile and transport : PSA Peugeot Citroën, Renault, Eaton, TRW...

Automobile Competition

Navy : DCN, Kamewa, Derby

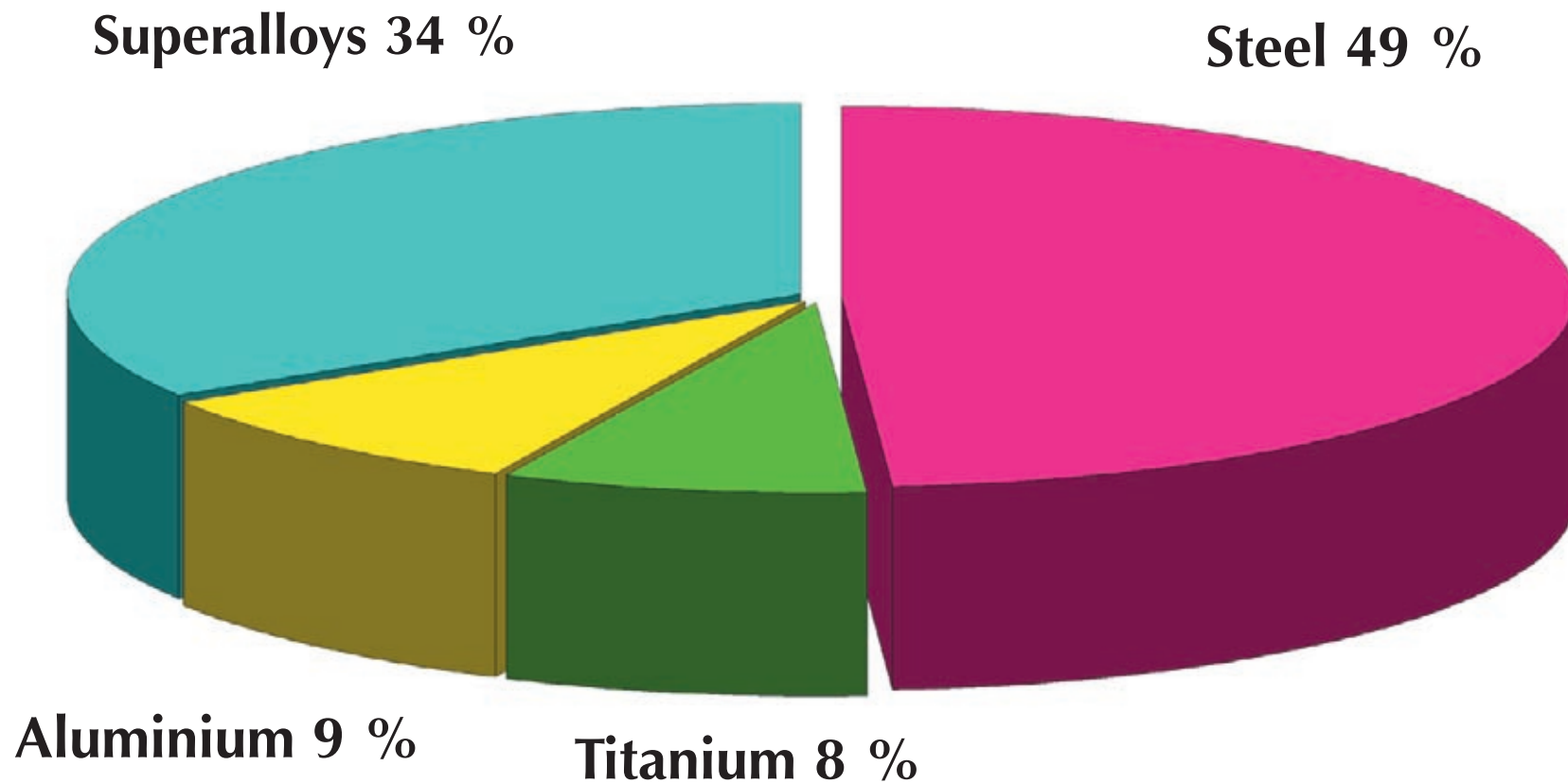
Medical : Depuy, Howmedica, Aesculap

Converters : Manoir, Monchieri...

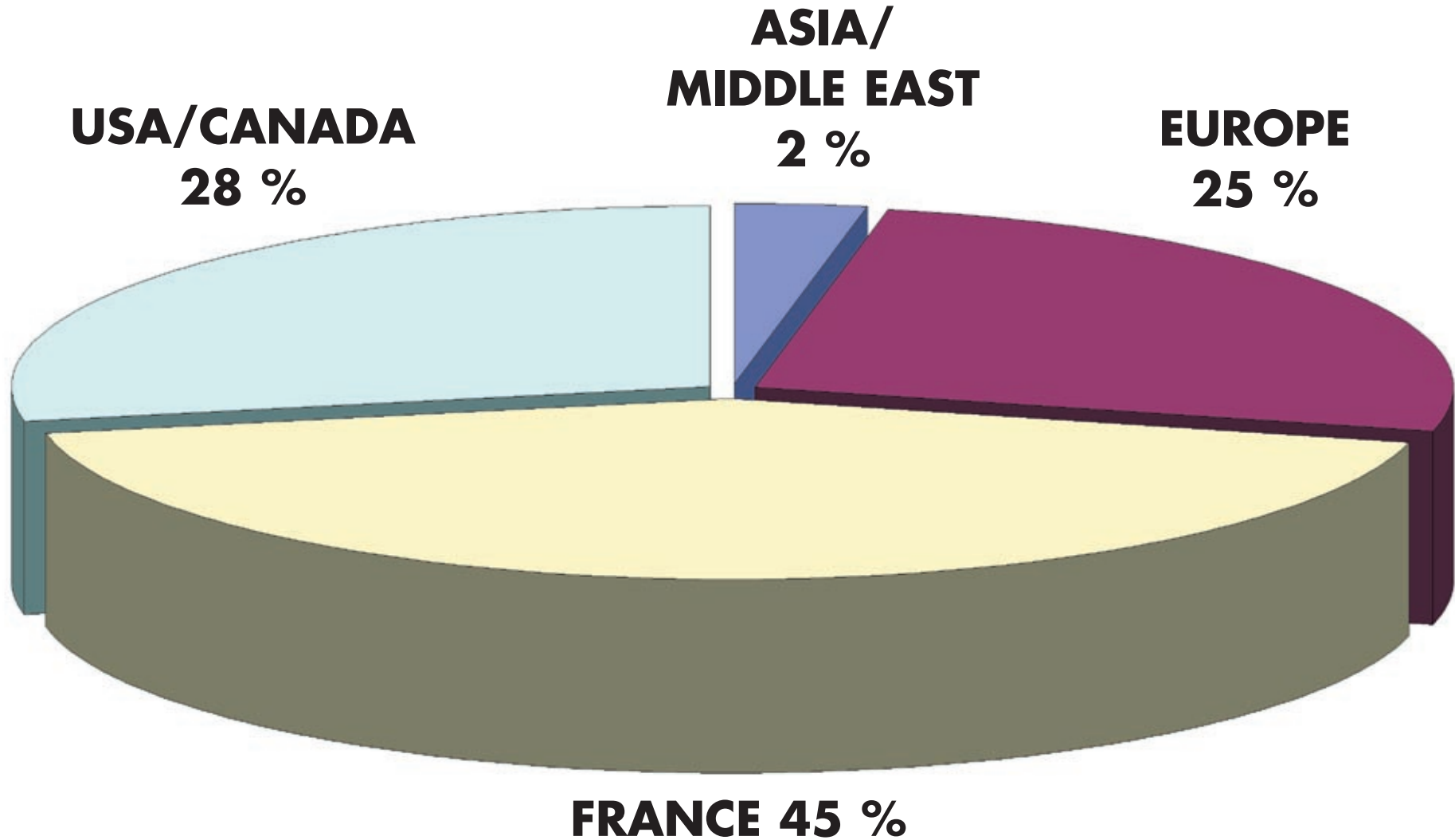
Powders : Emitec, Scandiamant, Castolin



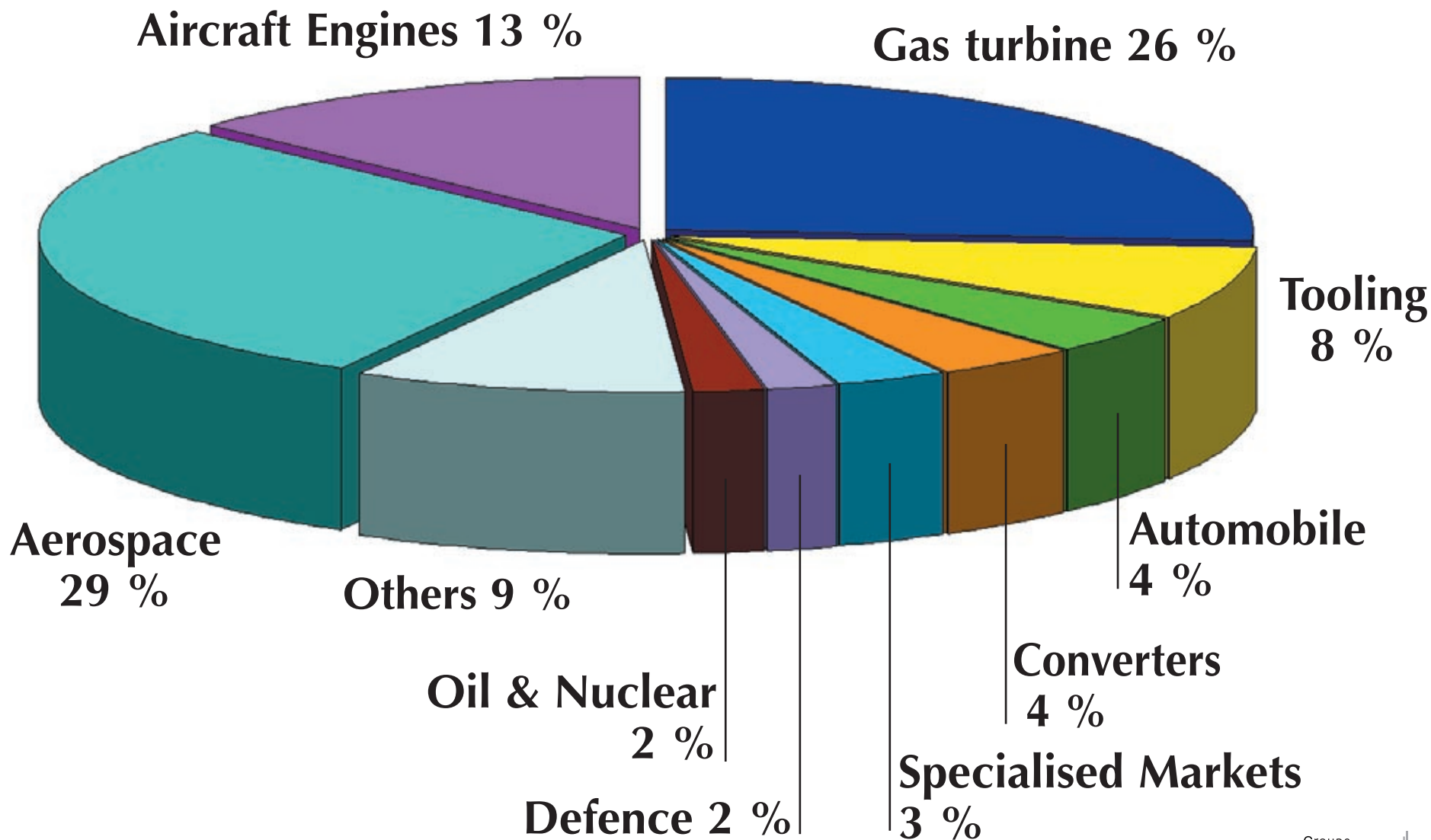
MATERIALS



**WORLDWIDE
MARKET**



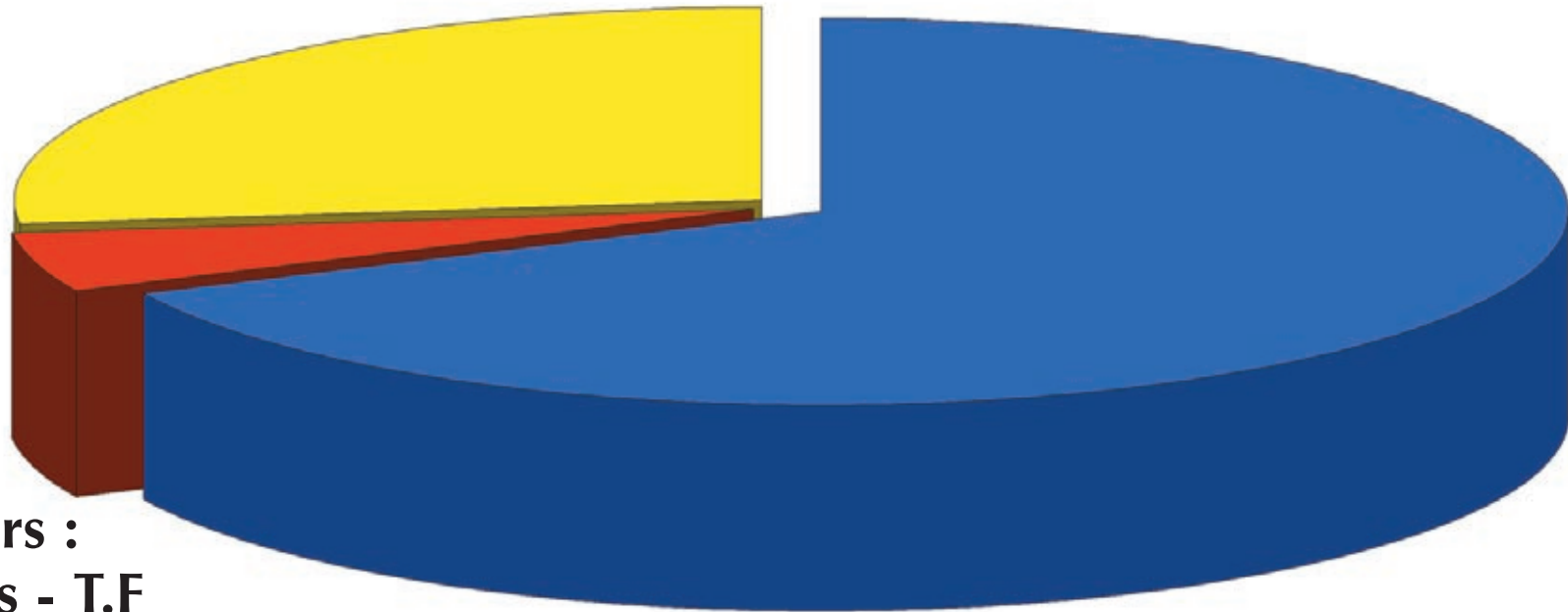
MAIN MARKETS



MAIN PRODUCTS



Bars and semi-products
27 %



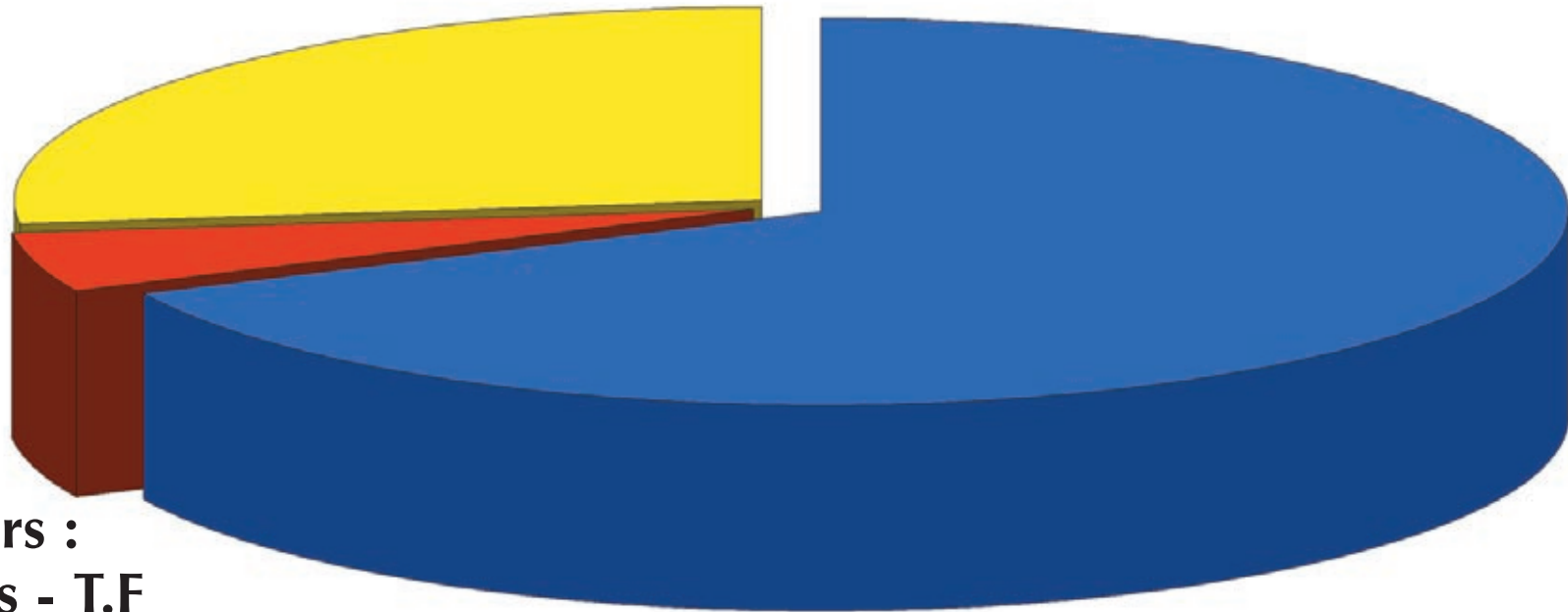
Others :
Powders - T.F
5 %

Open & closed
die forgings
68 %

MAIN PRODUCTS



Bars and semi-products
27 %

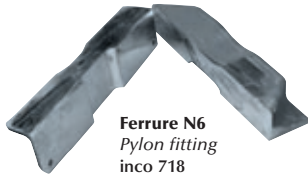


Others :
Powders - T.F
5 %

Open & closed
die forgings
68 %

A340 - 600

AUBERT & DUVAL



Ferrure N6
Pylon fitting
inco 718
42 kg



Croix Vert. Ar.
Central wing box
vertical fitting
7010
214 kg

Nervure 14 ext.
Pylon rib
TA6V
27 kg



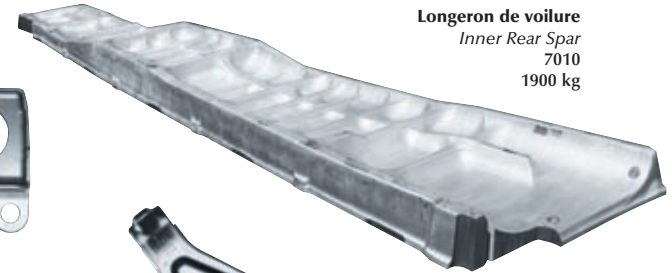
Forward Pintle
TA6V
150 kg



Compas
Torque link
TI 6.6.2
78 kg



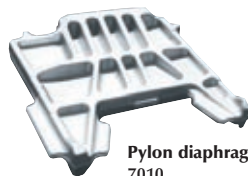
Longeron de voileure
Inner Rear Spar
7010
1900 kg



Eclisse croix
Wing
attachement
fitting
7010 T 7454
1020 kg

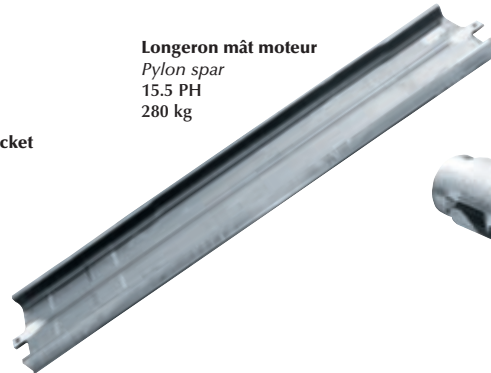


Tige coulissante train central
CLG sliding member
300 M
1670 kg



Pylon diaphragm
7010
67 kg

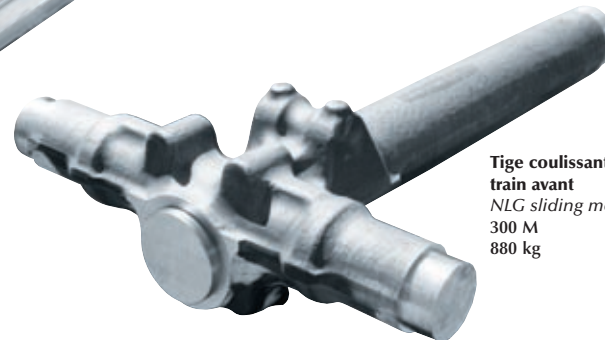
Longeron mât moteur
Pylon spar
15.5 PH
280 kg



Pylon bracket
TA 13
128 kg

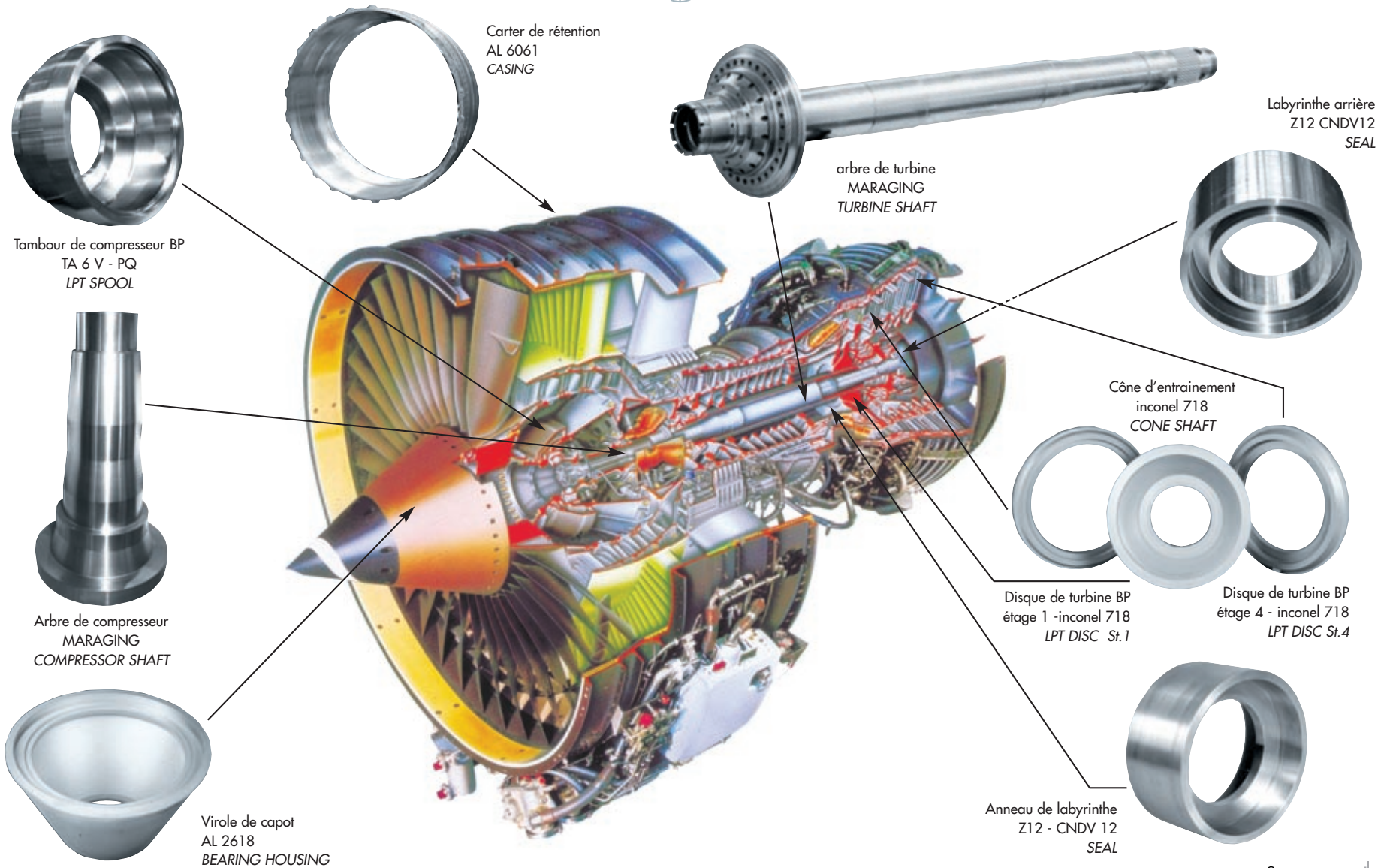


Tige coulissante train avant
NLG sliding member
300 M
880 kg



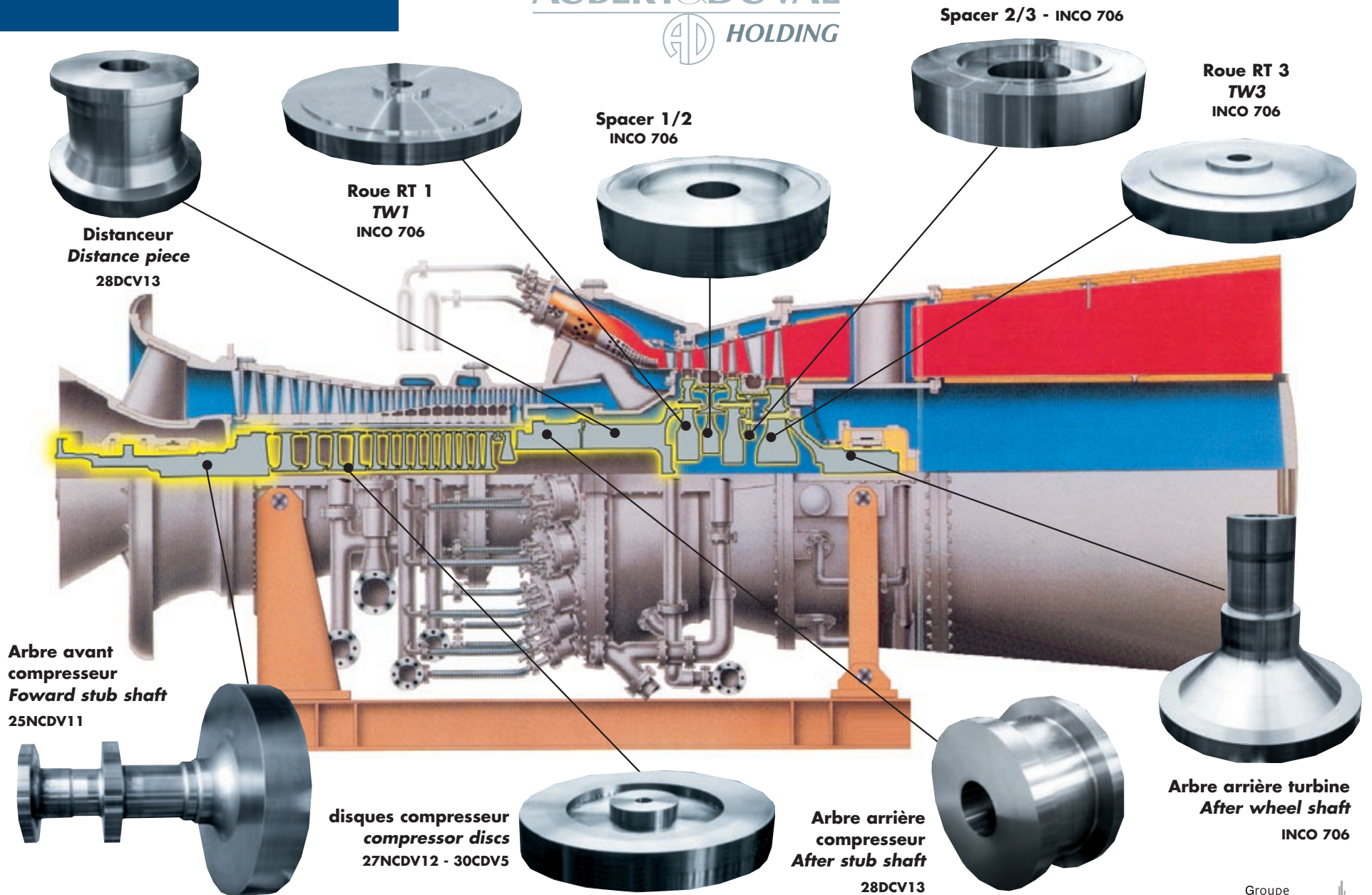
CFM 56

AUBERT & DUVAL
HOLDING



7FA Gas Turbine

AUBERT & DUVAL
HOLDING



PW 4000

AUBERT&DUVAL
HOLDING



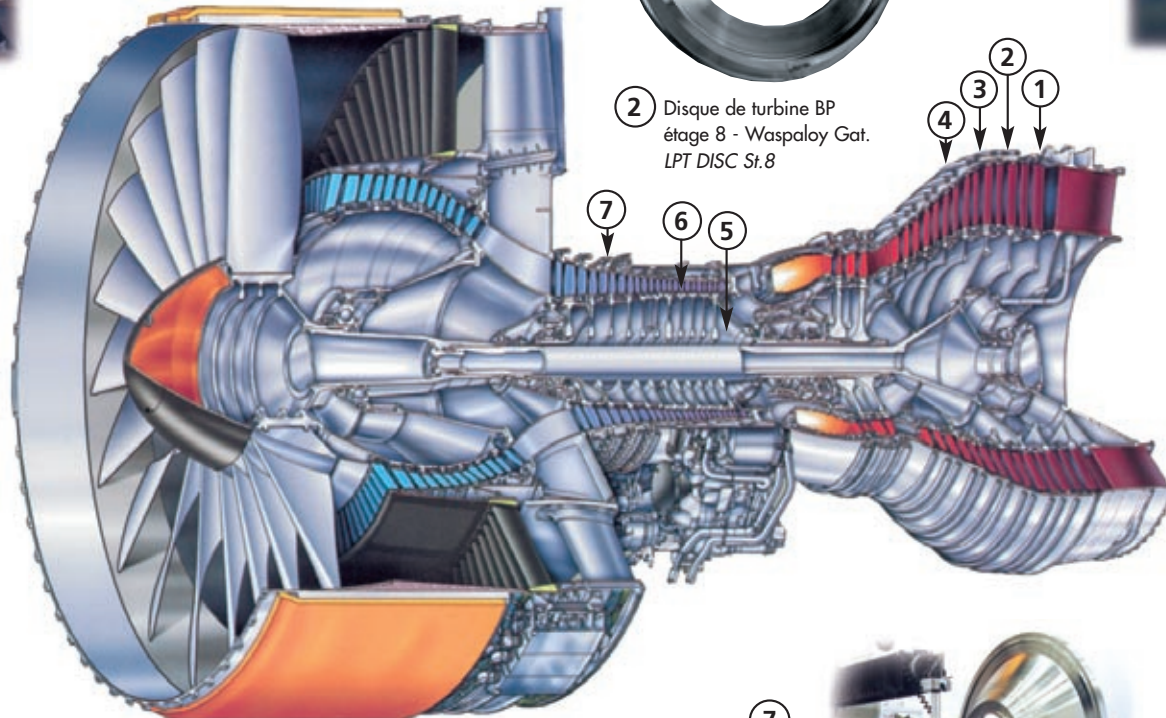
① Disque de turbine BP
étage 9 - inonel 718
LPT DISC St. 9



⑤ Moyeu arrière
inonel 718
HUB FRONT REAR



⑥ Disque compresseur HP
étage 14 - inonel 718
HPC DISC St. 14



② Disque de turbine BP
étage 8 - Waspaloy Gat.
LPT DISC St. 8



⑦ Disque de turbine BP
étage 5 - inonel 718
LPT DISC St. 5

⑦ Disque de turbine BP
étage 5 - inonel 718
LPT DISC St. 5



④ Disque de turbine BP
étage 6 - Waspaloy Gat.
LPT DISC St. 6



③ Disque de turbine BP
étage 7 - inonel 718
LPT DISC St. 7

OIL INDUSTRY



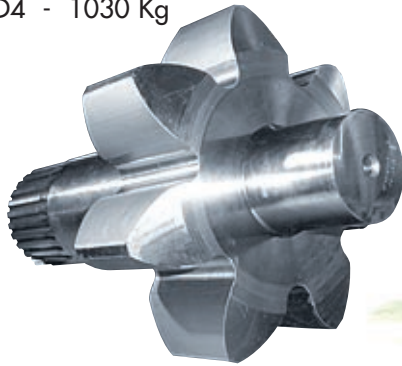
Drilling tool arms and cones

15 ND 14 - 20 NCD 2
53 Kg to 212 Kg



JACK UP PINION

42CD4 - 1030 Kg



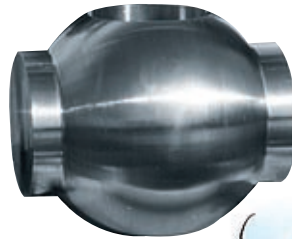
STRESS JOINT RISER

ASTM A707 - 2950 Kg



BALL

INCO 625 - 300 Kg



SWIVEL JOINT

super duplex UNS S32750 - 4300 Kg



«Y» PIECE

super duplex UNS S32750
2230 Kg



NOZZLE

uranus 52 UNS S32550
200 Kg



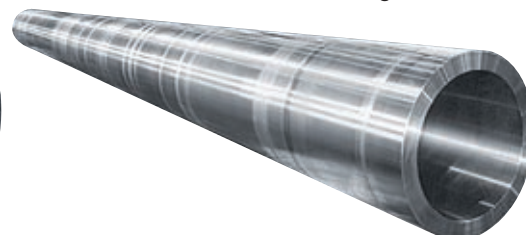
SOLID BLOCK

AISI 4130 - 6100 Kg



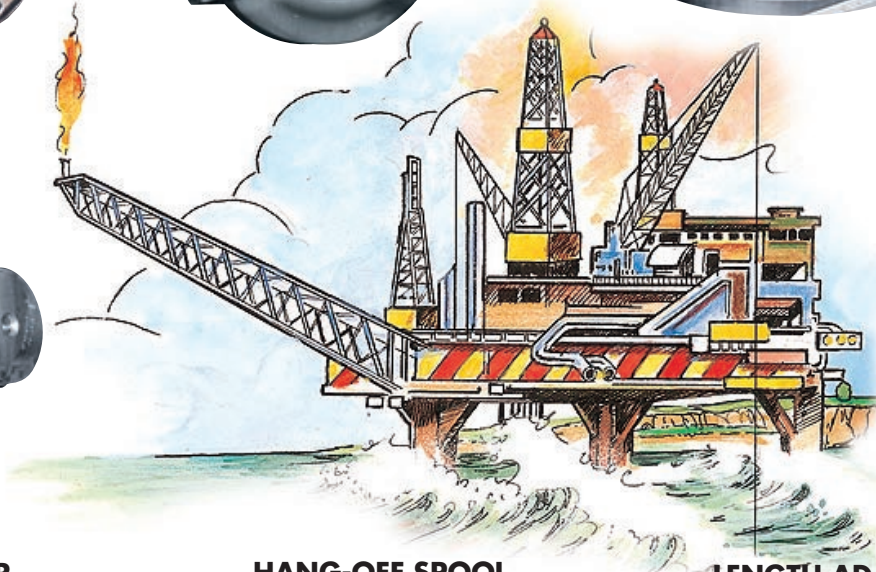
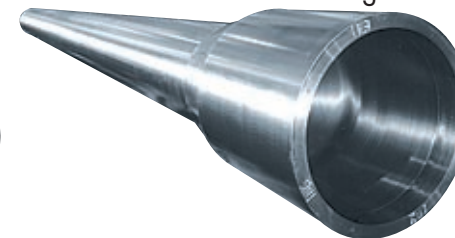
HANG-OFF SPOOL

ASTM A707 - 11000 Kg



LENGTH ADJUSTMENT SPOOL

ASTM A707 - 10500 Kg



DEFENCE

AUBERT & DUVAL
HOLDING

Oslet de poste de pilotage
Driver's hatch (BRADLEY TANK)
7039 - 99 kg



Tubes
d'artillerie
90 mm to 155 mm
gun barrel
30 NCDV 14
460 kg to 3 400 kg



Bras de suspension
Suspension arm
(LECLERC TANK)
30 NCD 16 ESR - 126 kg



Masque de tourelle
Tank turret mantlet
(TML 105 - AMX 10 RC TANK)
7005 M10 T6 - 195 kg



Tête de flèche
Supporting beam head
(155 TR GUN)
25 CD 4S
83 kg



Demi galet de roulement
Track roller
(LECLERC TANK)
2214 T6 - 53 kg



Assise
de porte de char
Door still
(AMX 10 RC TANK)
7020 T6 - 48 kg

Manchon de culasse
Breech ring
(155 TR GUN)
32 NCDV 12 ESR
877 kg

