

INNOVATION
CMF
RENOWNED
INDUSTRIAL APPLICATIONS



OUR BUSINESS SPIRIT: INNOVATION & PERFORMANCE

PRESENTATION

PARTNERSHIP
SPECIAL STEEL
SOLUTION
FORGED
RESISTANCE

SUMMARY

1 – OVERVIEW OF MG VALDUNES

2 – FORGED MECHANICAL COMPONENTS

- FMC product line
- FMC forging process
- Test & expertise capabilities
- FMC references
- Certifications
- Benefits for industrial customers
- Contacts





INNOVATION
CMF
RENOWNED
INDUSTRIAL APPLICATIONS
PARTNERSHIP
SPECIAL STEEL
SOLUTION
FORGED

OVERVIEW OF MG VALDUNES

CMF
RENOWNED
INDUSTRIAL APPLICATIONS
PARTNERSHIP
SPECIAL STEEL
SOLUTION
FORGED
RESISTANCE

OVERVIEW OF MG-VALDUNES

- More than 100 years of experience
- Subsidiary of ASCO Industries till 1998
- MG Valdunes is now a subsidiary of Maanshan Iron & Steel Co, China (Ma Steel)
- Ma Steel is a major figure in the world steel industry
 - Steel production of 18 million tonnes per year, workforce over 40 000 persons
 - Turnover 14 Billion USD
 - Capacity 1 million wheels per year
 - 85% of Ma Steel's production serves the Chinese market



OVERVIEW OF MG-VALDUNES



- Market Leader for high performance railway wheels, axles and wheelsets
- The most comprehensive portfolio in the wheelset industry
- Highly experienced partner for expert services, product design, approval and maintenance
- High performing R&D engineers providing the best technical products & applications
- A complete range of approvals & certifications worldwide, including IRIS (railway) and ISO9001
- Worldwide agent network – our products are currently in use in over 80 countries

INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS

OVERVIEW OF MG-VALDUNES

2 MARKETS	TURNOVER 2015 (M €)		EMPLOYEES
Wheels, axles and wheelsets for the railway industry Forged Mechanical Components revolution parts for industrial applications	TOTAL	+/- 60	MA Steel  40 000 MG Valdunes  480
	Passengers	+/- 35	
	Freight	+/- 15	
	FMC	+/- 6	
	EWC	+/- 4	



INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS

PRODUCTION CAPABILITIES

DUNKIRK



Industrial

Black wheels
Crane wheels

160 employees

VALENCIENNES



Rail

Wheels
Axles
Wheelsets

320 employees

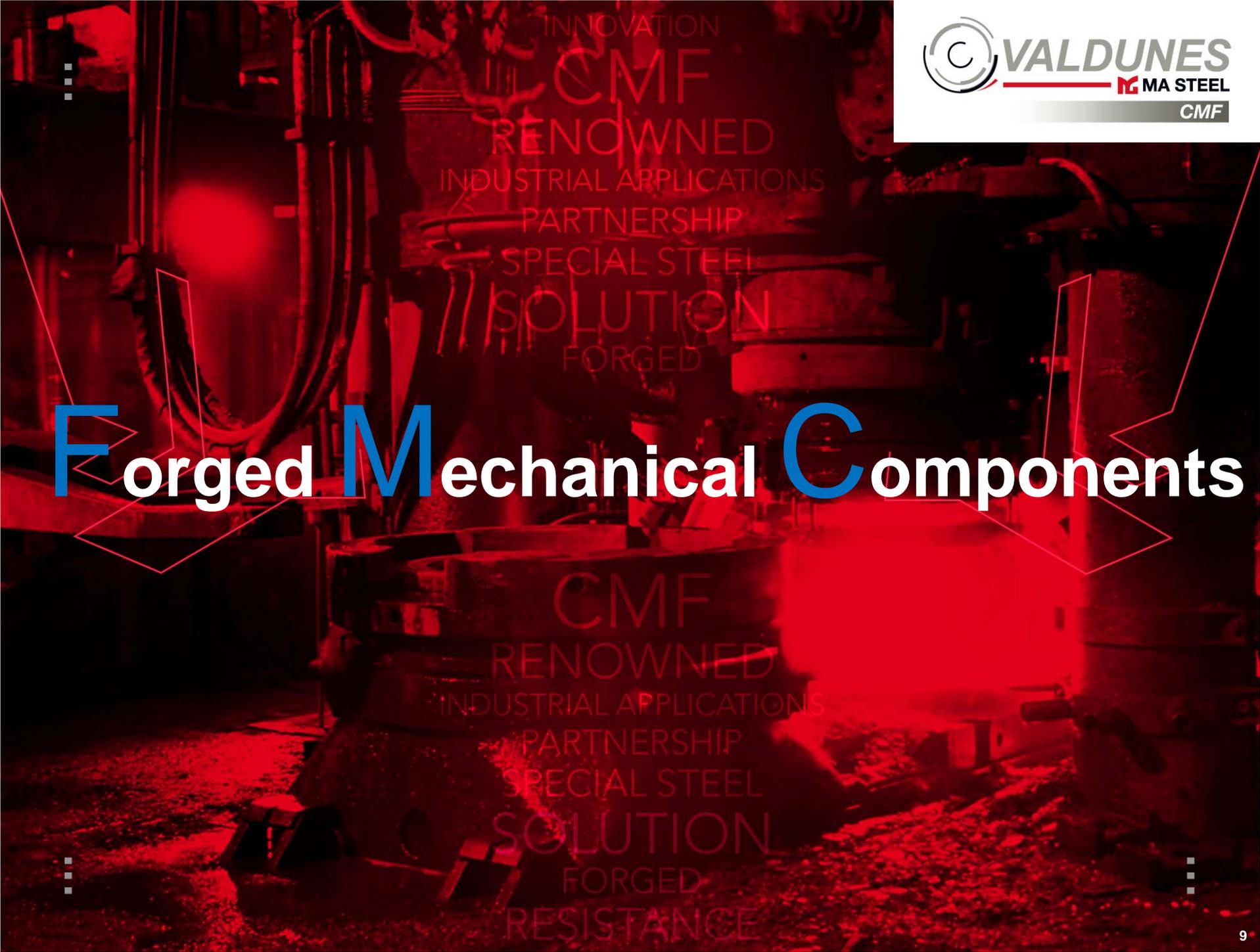
OVER €50 MILLION INVESTMENT IN NEXT 5 YEARS

DUNKIRK

- Refurbishment of the 5000 tons press
- 2 new machinery centers for industrial wheels
- Polyner quenching tank
- Painting process (industrial wheels)
- 2 New efficient furnaces for Heat Treatment of Forged Mechanical Components
- Modernization and change of the rolling mill
- Installation of a new workshop for resilient wheels

VALENCIENNES

- Modernization of the heating furnace of the Heat Treatment
- 4 New machining centers for complex product
- New line for axles machining and 1 new machining line for standard products
- Shipping zone in a building extension
- Investment in maintenance of motor and passenger wheel-sets



INNOVATION
CMF
RENOWNED
INDUSTRIAL APPLICATIONS
PARTNERSHIP
SPECIAL STEEL
SOLUTION
FORGED

Forged Mechanical Components

CMF
RENOWNED
INDUSTRIAL APPLICATIONS
PARTNERSHIP
SPECIAL STEEL
SOLUTION
FORGED
RESISTANCE

FMC PRODUCT LINE

Crane wheels, gears, discs, pulleys, piston heads... for industrial applications

Grades for crane wheels:

- ✓ 42CrMo5-04 (Cranes)
- ✓ 42CrMo4 (Cranes)
- ✓ Class C
- ✓ 50CrMo4

Grades for gears:

- ✓ 18CrNiMo7-6
- ✓ 18CrNi8
- ✓ 16NiCrMo13
- ✓ 30CrNiMo8
- ✓ 42CrMo4
- ✓ Others...

Grades for brake discs:

- ✓ 28CrMoV5-08



CRANE WHEELS, SHEAVES, GEARS AND DISCS FOR INDUSTRIAL APPLICATIONS

Diameters:

- 250 mm to 1,400 mm

Block weight:

- 100 kg to 3.2 tons

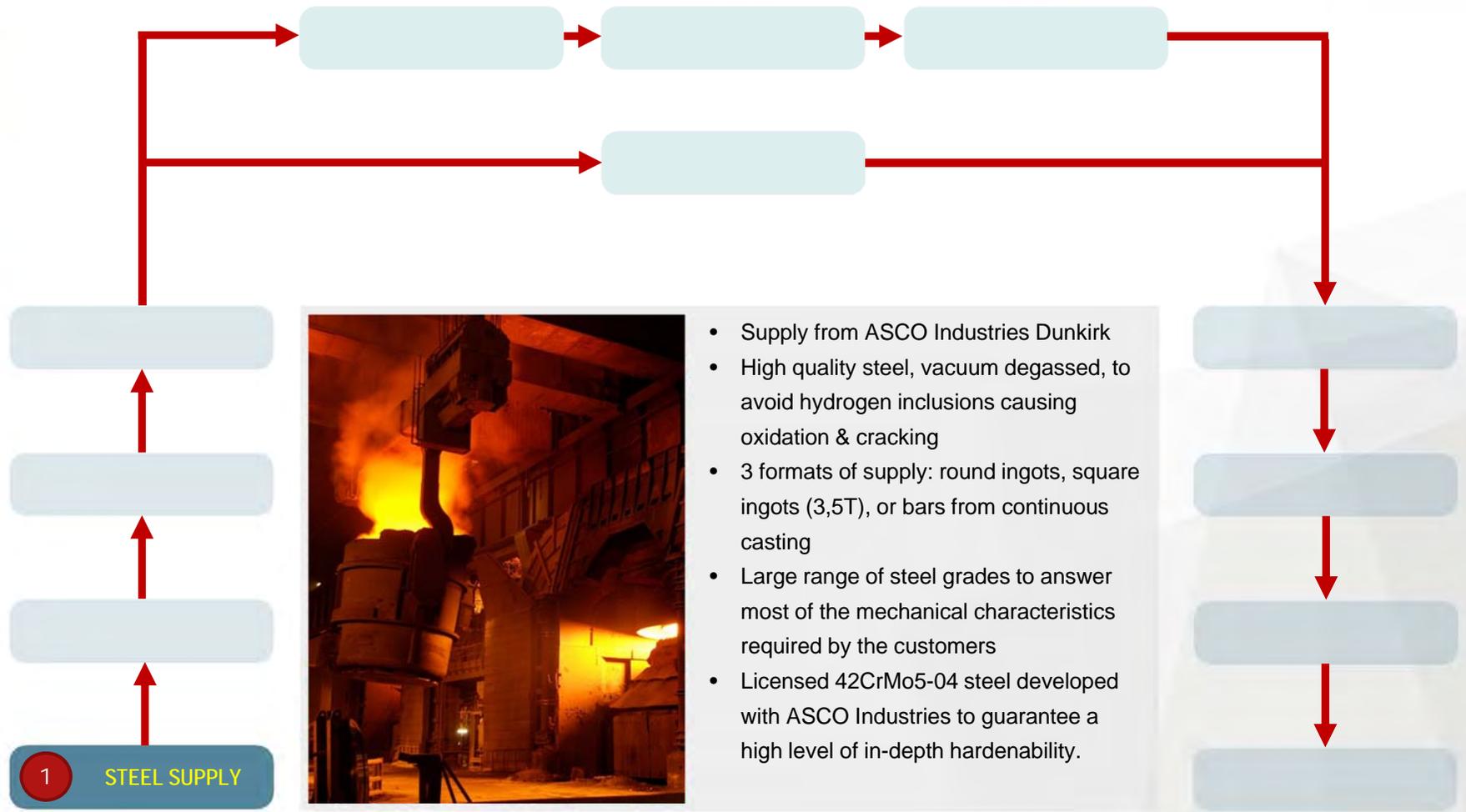
Crane wheels produced according to:

- DIN 15078, 15079, 15090, 15093...
- SID S466A, S466E
- Upon customer specification & drawings

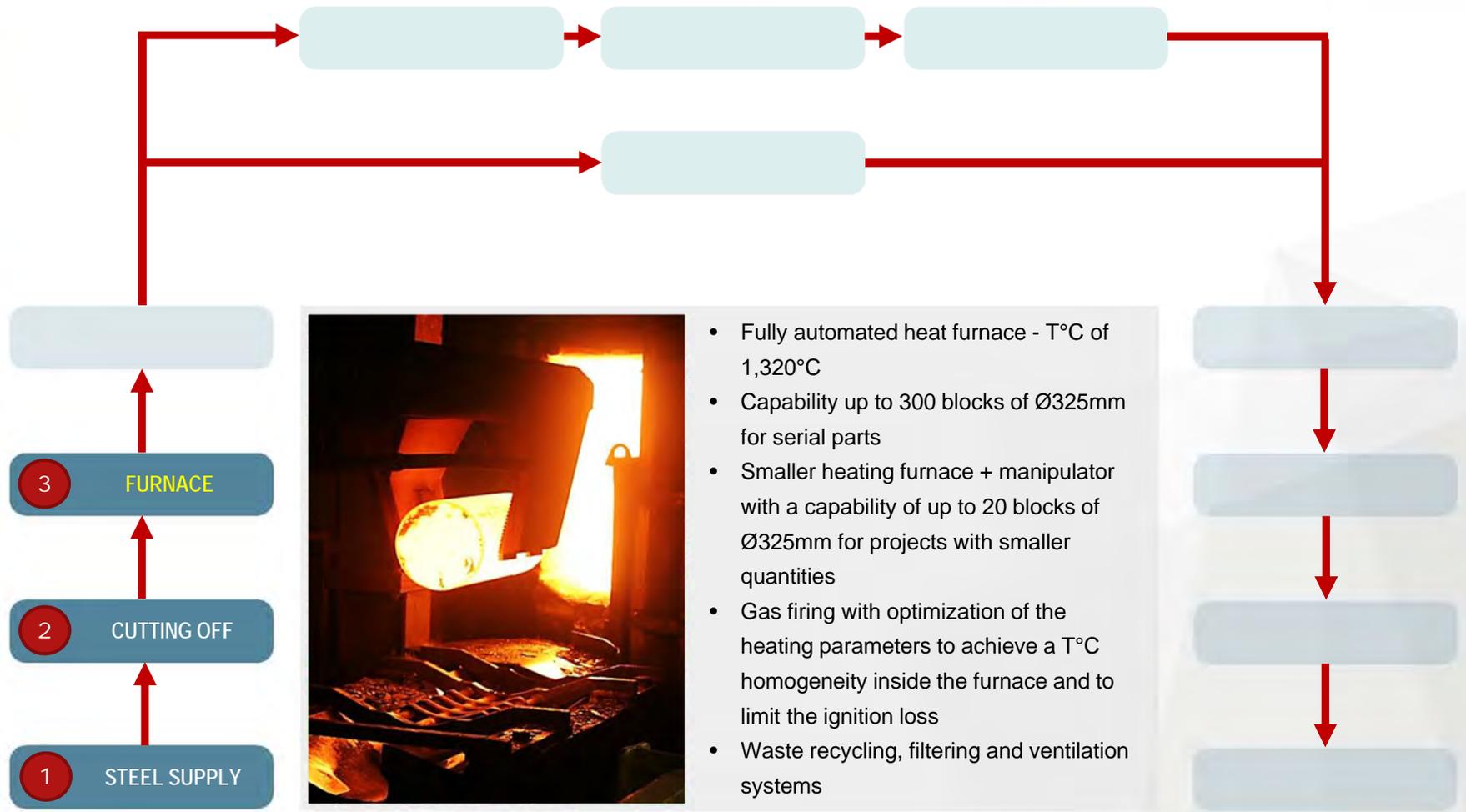
(ThyssenKrupp Steel Standards, ACM standards, etc...)



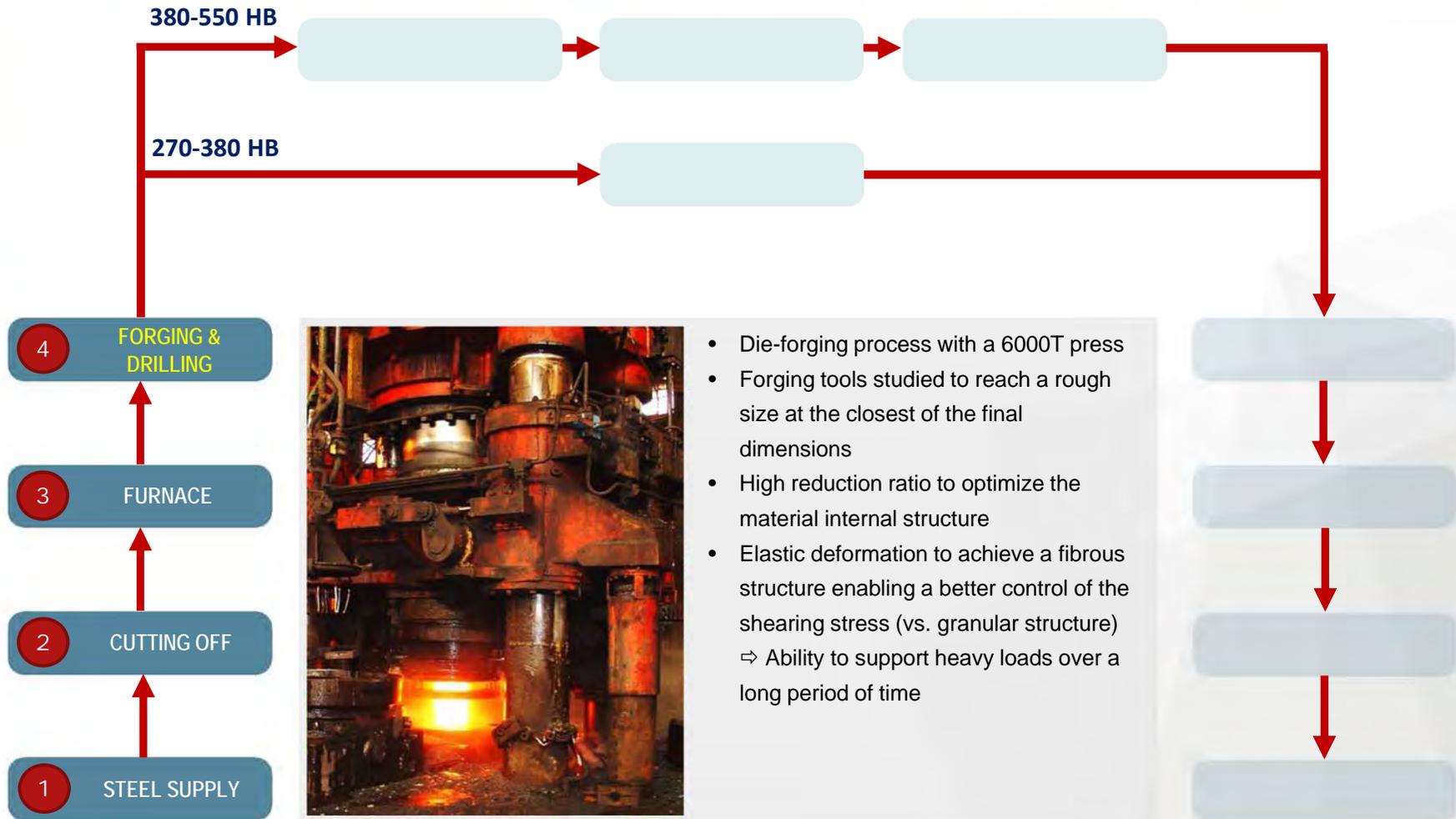
INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS



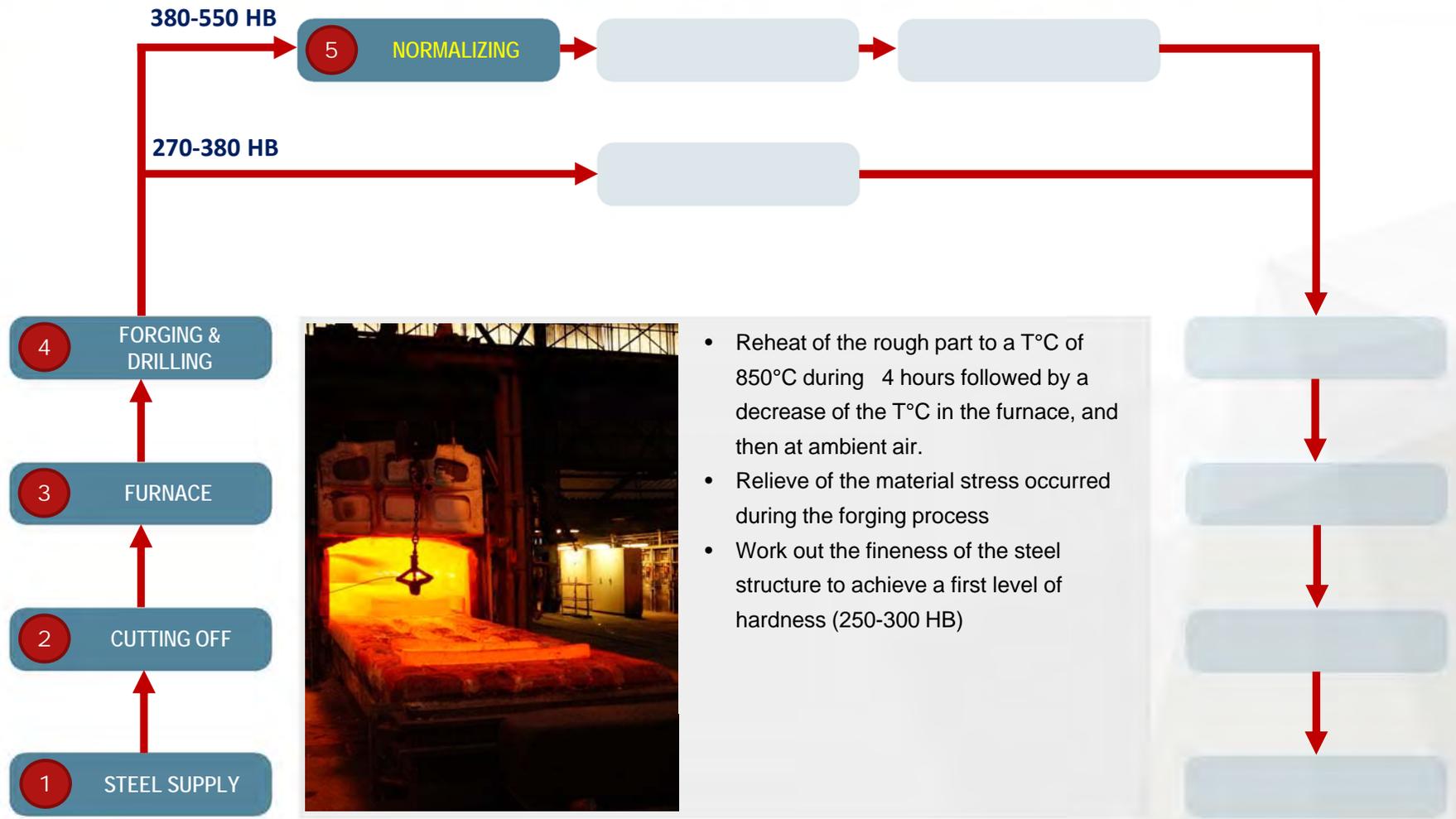
INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS



- Fully automated heat furnace - T°C of 1,320°C
- Capability up to 300 blocks of Ø325mm for serial parts
- Smaller heating furnace + manipulator with a capability of up to 20 blocks of Ø325mm for projects with smaller quantities
- Gas firing with optimization of the heating parameters to achieve a T°C homogeneity inside the furnace and to limit the ignition loss
- Waste recycling, filtering and ventilation systems

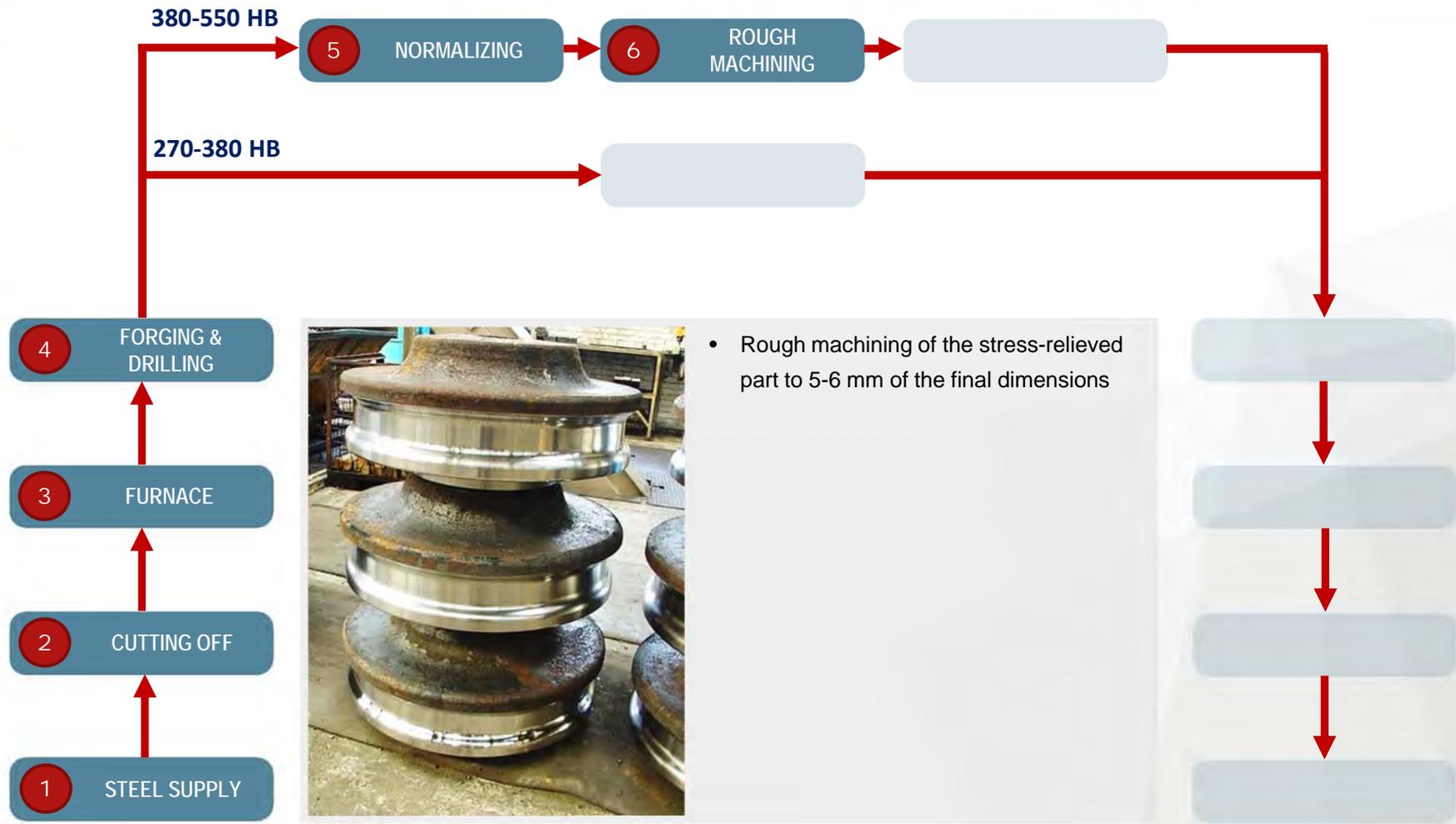


INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS

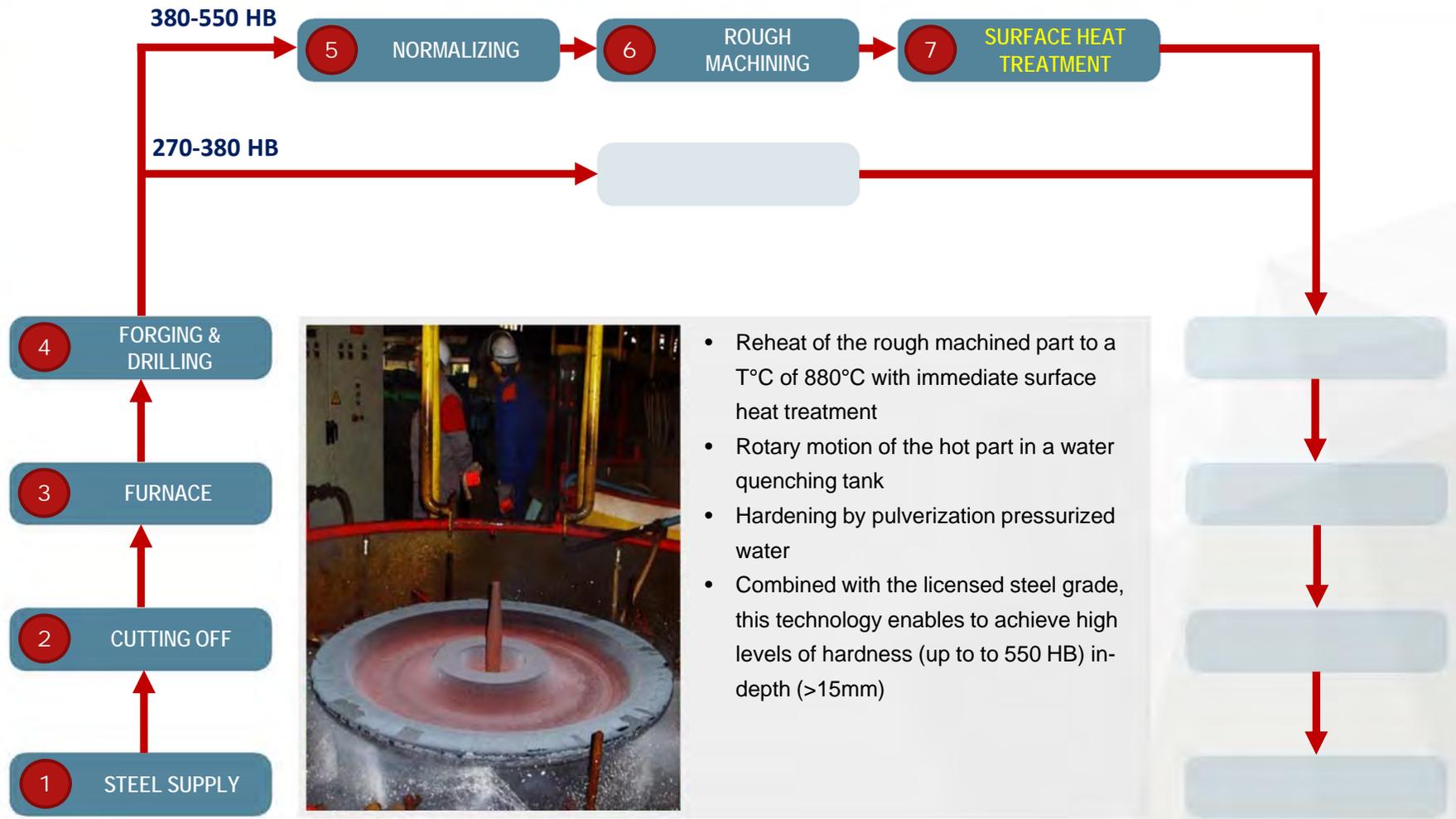


- Reheat of the rough part to a T°C of 850°C during 4 hours followed by a decrease of the T°C in the furnace, and then at ambient air.
- Relieve of the material stress occurred during the forging process
- Work out the fineness of the steel structure to achieve a first level of hardness (250-300 HB)

INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS

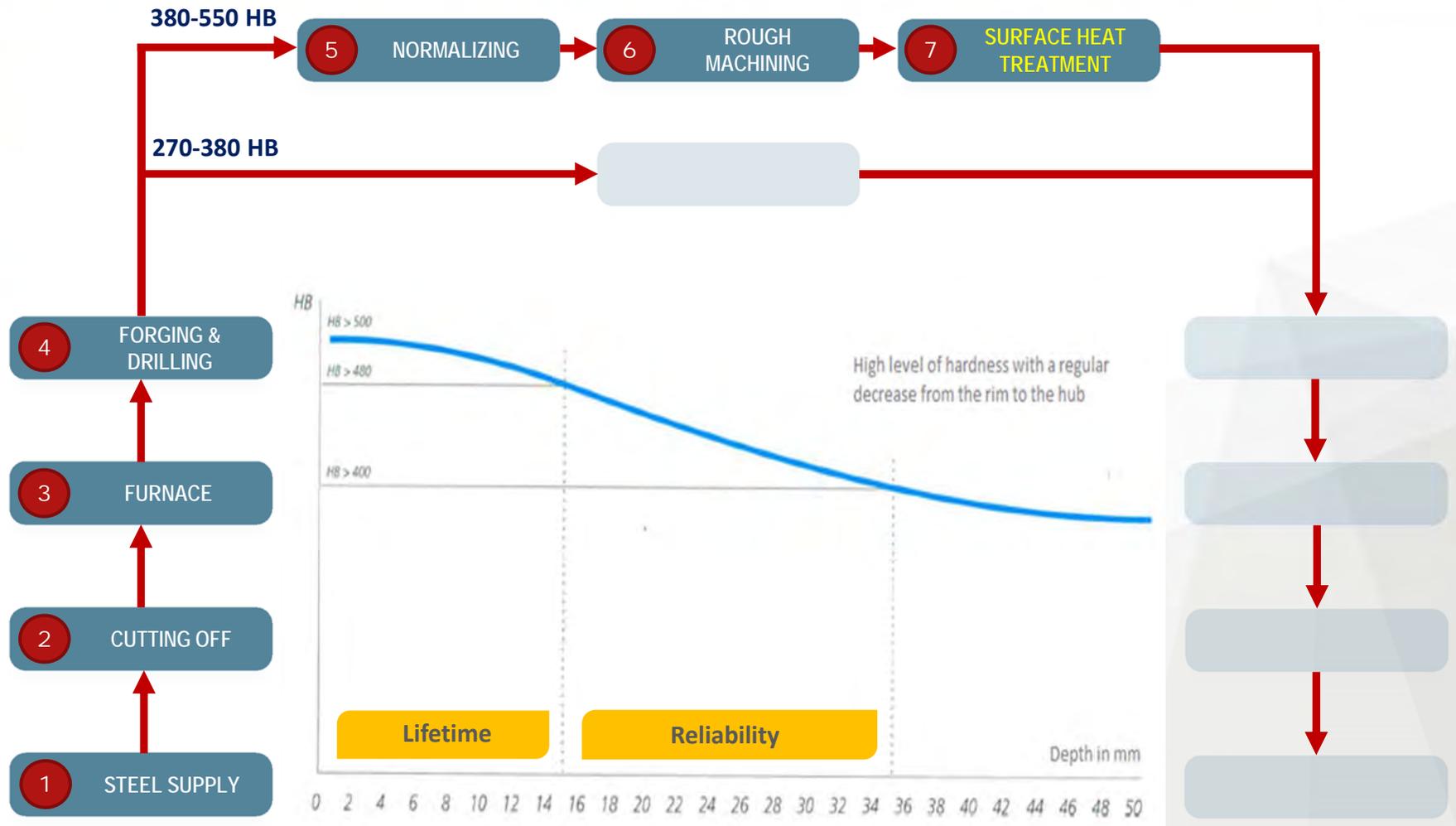


INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS



- Reheat of the rough machined part to a T°C of 880°C with immediate surface heat treatment
- Rotary motion of the hot part in a water quenching tank
- Hardening by pulverization pressurized water
- Combined with the licensed steel grade, this technology enables to achieve high levels of hardness (up to to 550 HB) in-depth (>15mm)

INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS

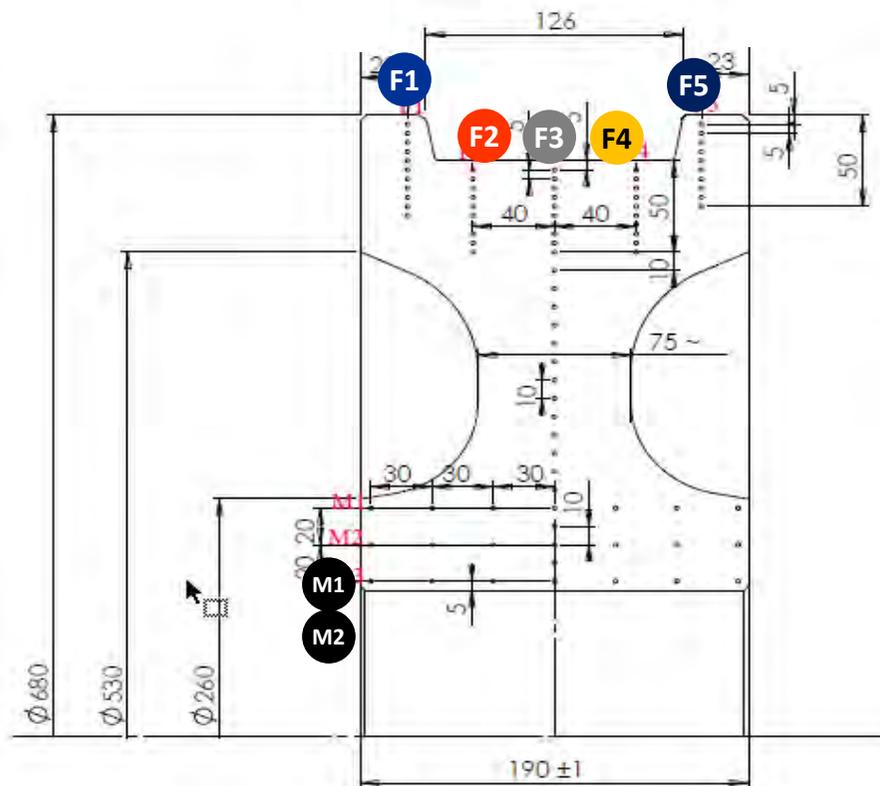


INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS

UNEQUALLED LIFETIME

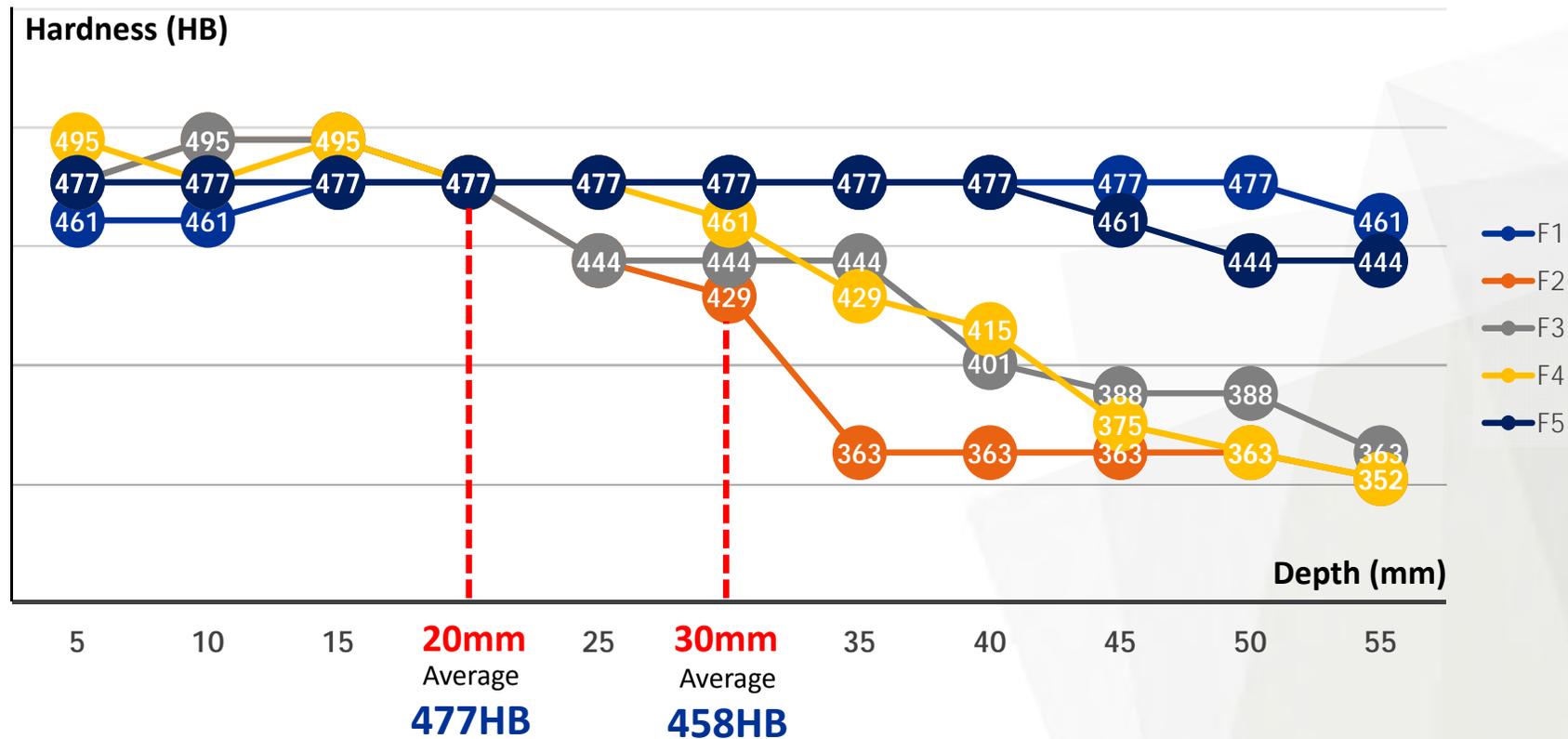
A combination between a high quality steel & a heat treatment know-how

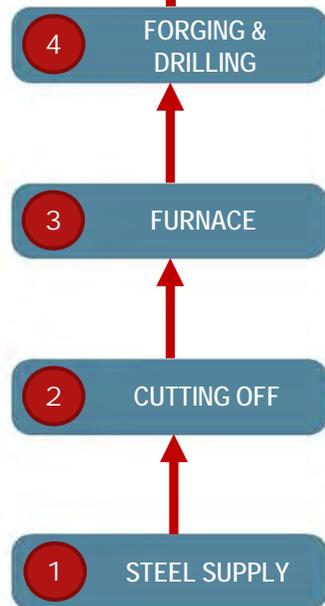
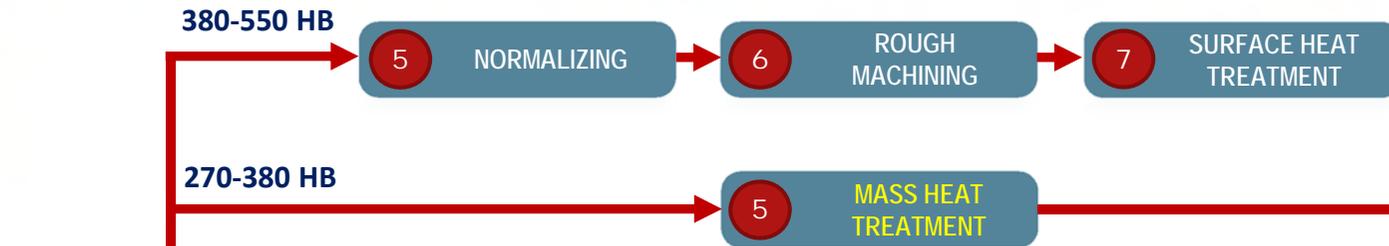
Ø680mm crane wheel
 450-500 HB surface heat treatment test results



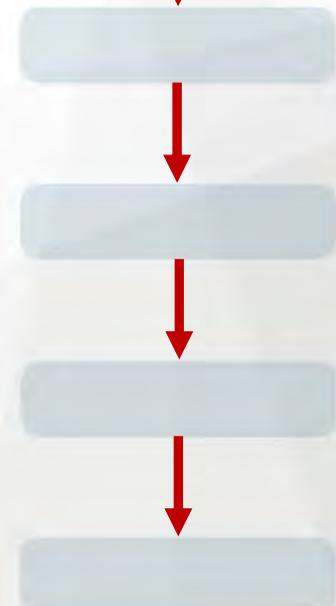
UNEQUALLED LIFETIME

A combination between a high quality steel & a heat treatment know-how

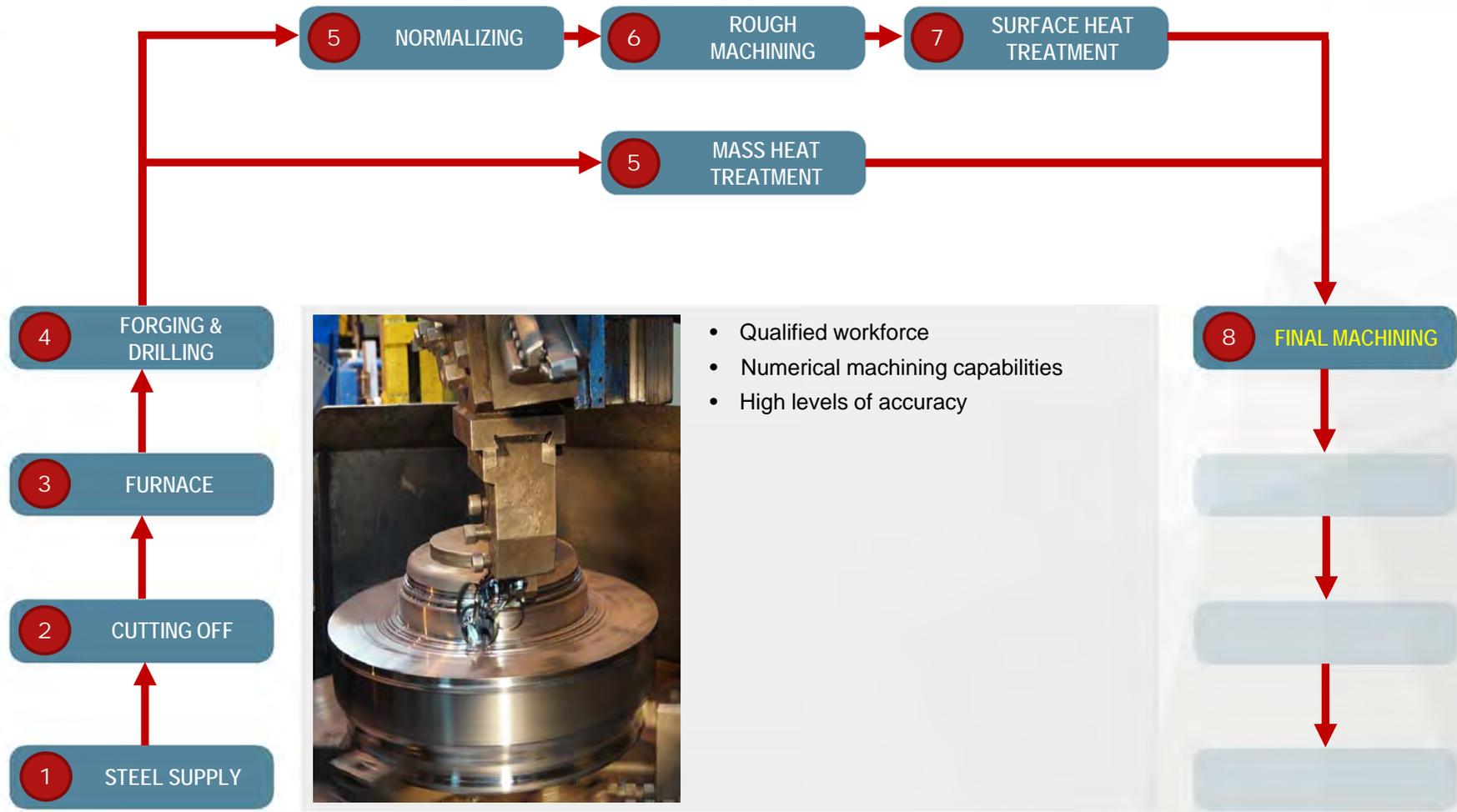




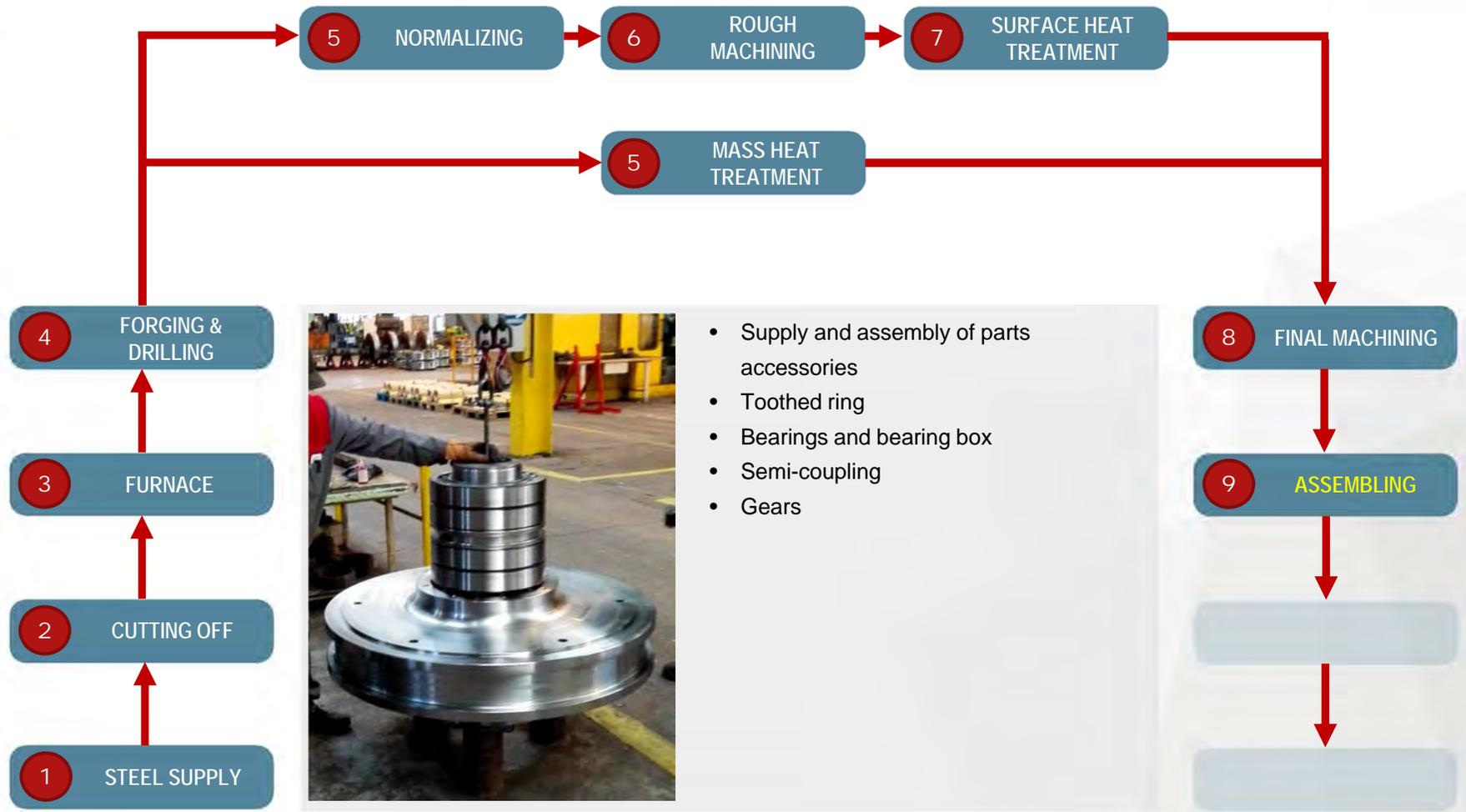
- Reheat of the part up to 880-920°C depending on the mechanical characteristics to achieve
- Mass heat treatment by water quenching to achieve a high level of fineness of the structure
 - ⇒ **Good resistance of the steel in service**
 - ⇒ **Prevention from cracks propagation**
- Hardness levels between 320 and 390 HB
- Ongoing investment in an polymer quenching tank



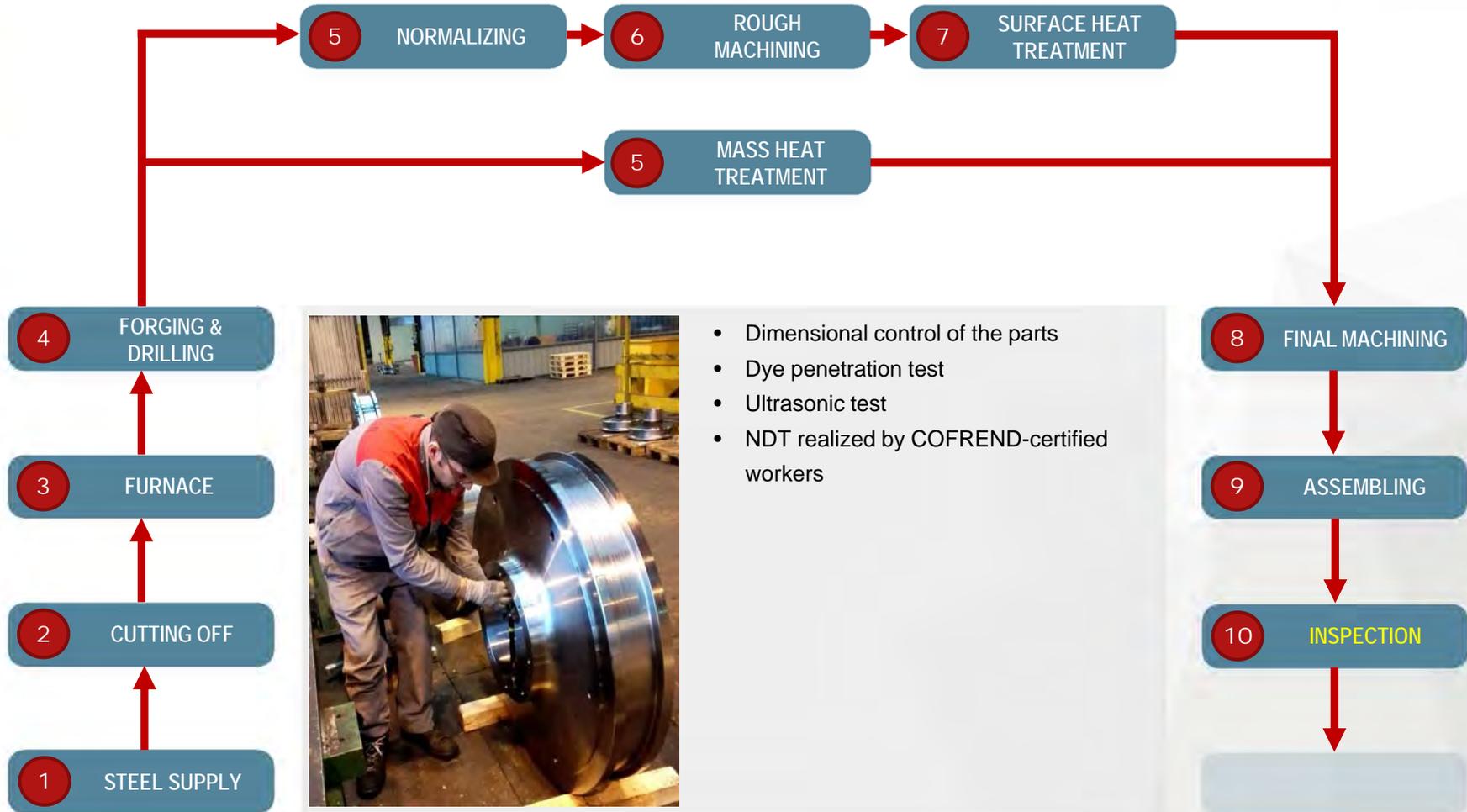
INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS



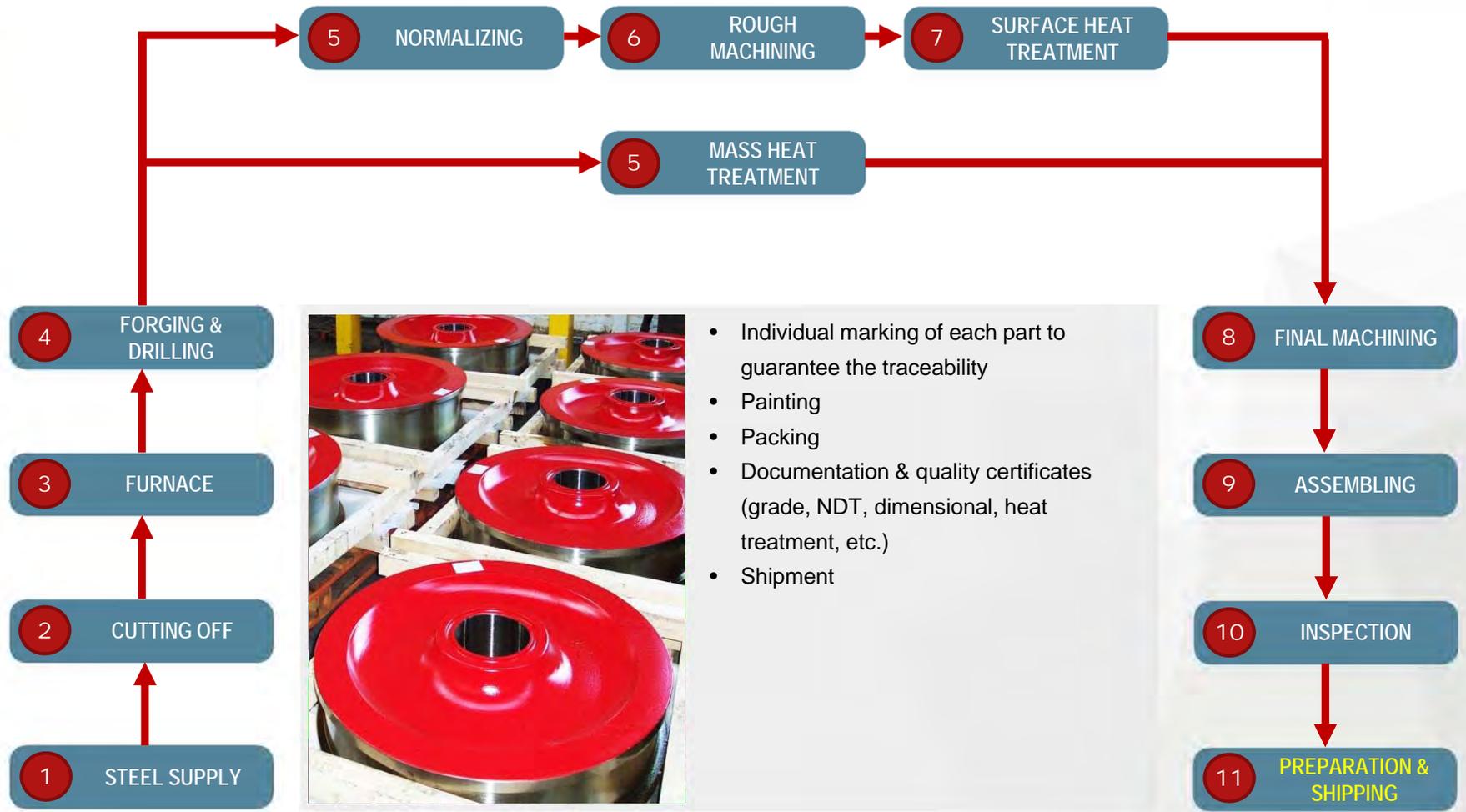
INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS



INNOVATION
CMF
RENOWNED
INDUSTRIAL APPLICATIONS

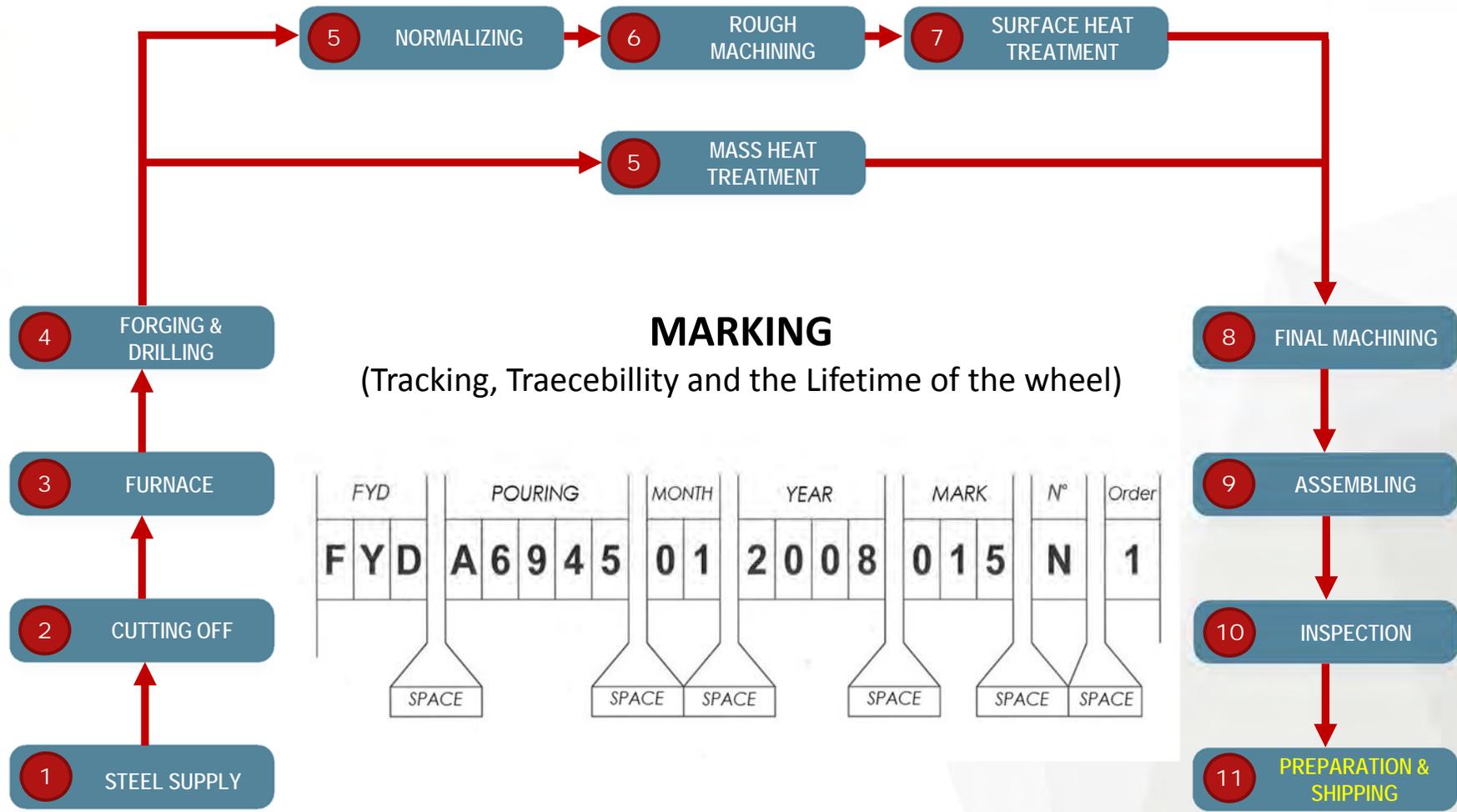


INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS



- Individual marking of each part to guarantee the traceability
- Painting
- Packing
- Documentation & quality certificates (grade, NDT, dimensional, heat treatment, etc.)
- Shipment

INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS



MARKING

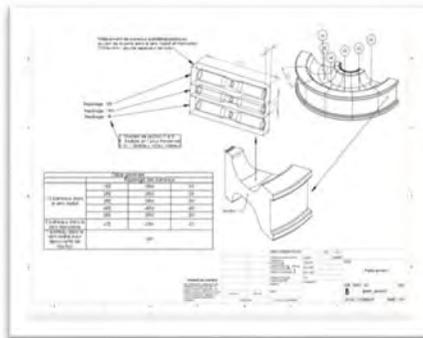
(Tracking, Traceability and the Lifetime of the wheel)

FYD	POURING					MONTH		YEAR			MARK		N°	Order		
F	A	6	9	4	5	0	1	2	0	0	8	0	1	5	N	1
SPACE	SPACE					SPACE		SPACE			SPACE		SPACE			

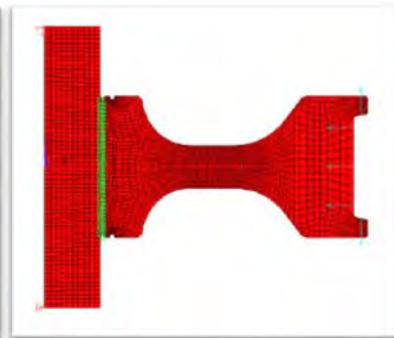
TEST & EXPERTISE CAPABILITIES

Mechanical contacts between crane rim & rail CEN/TS 13001-3-3

Finite element calculations (ANSYS, ABAQUS & MATLAB softwares)



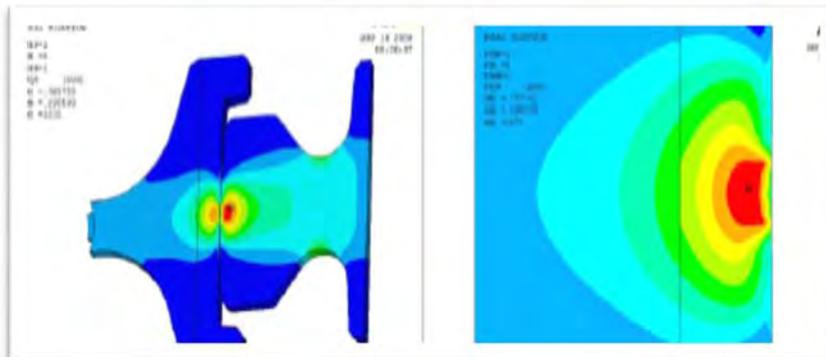
Material properties



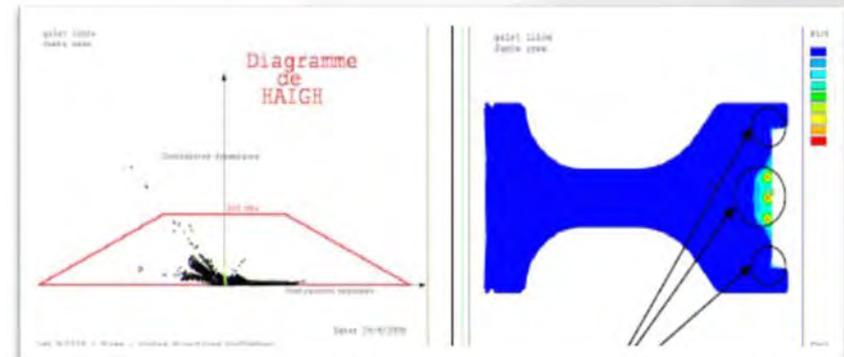
Crane wheel meshing & loading



Crane wheel/rail contact definition



FEA contact calculation



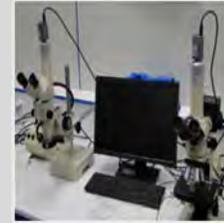
Fatigue calculation

TEST & EXPERTISE CAPABILITIES

Defect examination



Root cause analysis



Samples surface preparation, Samples resin coating for examination, Micrographic examination (Picture analyzer: Cleanliness, Grain size, Microstructure), Optical microscopic examination

Recommendations

EXPERTISE E14513	
Document : E14513	Revision : 1
TATA STEEL'S CRANE WHEEL DEFECTS ANALYSIS	Page : 1 / 37
Date : JULY, 2014	

- VALDUNES PROPERTY - ALL RIGHTS RESERVED -

EXPERTISE E14513
 -
 TATA STEEL'S CRANE WHEEL DEFECTS ANALYSIS

To : MM Gosselin, Ooghe, Mrs Ferraout
 Copy : Mrs Foltz, M. Chatelein

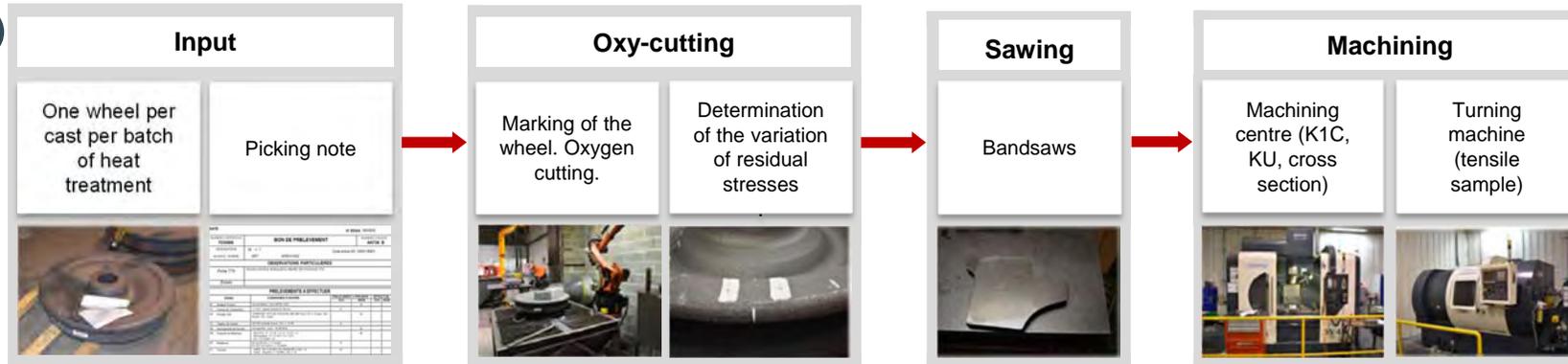
	Written by	Approval		
Service :	TEST CENTER	DDR		
Name :	LEFEBVRE A. HANNEZ A.	F. DEMILLY		
Visa				

Reproduction prohibited

METALLURGICAL TEST CENTER

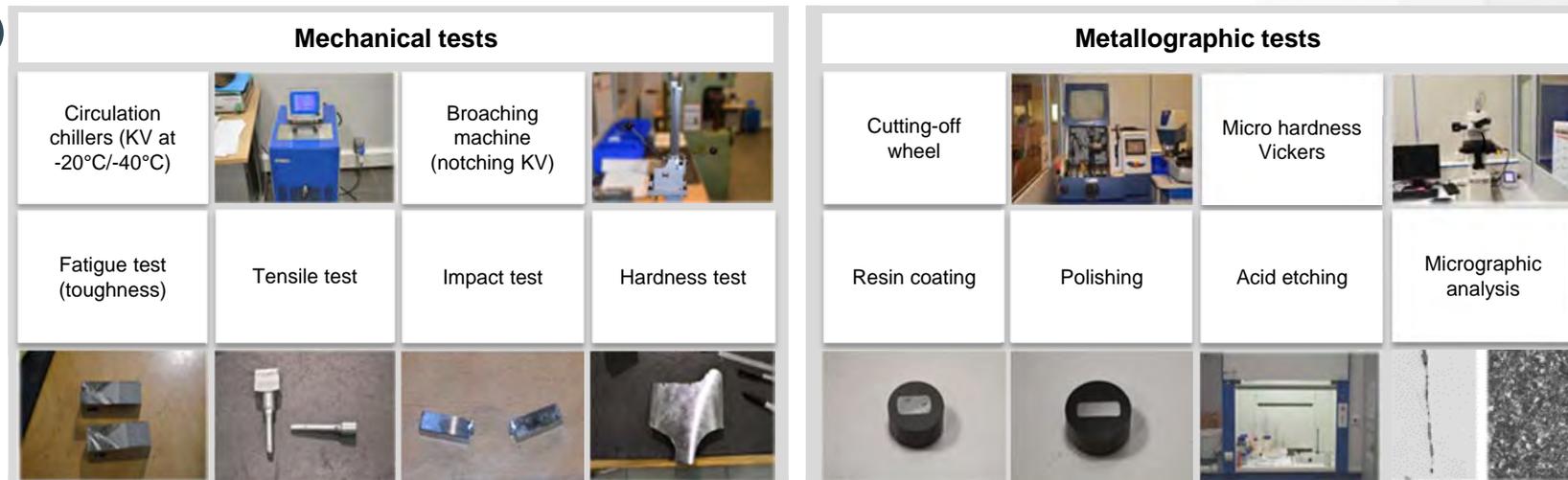
1

PREPERATION



2

TESTS



3

OUTPUT

INNOVATION
CMF
 RENOWNED
 INDUSTRIAL APPLICATIONS

FMC REFERENCES

STEEL INDUSTRY

Arcelor Mittal
 Asco Industries
 Riva Group
 Saarstahl
 Tata Steel
 Valhourec
 Constellium
 Alteo
 Industeel
 Aperam
 Thyssen
 Luccini
 Dillinger Hütte
 ...

CRANE BUILDERS

Danieli
 ECL
 Eiffage
 Fayat Group
 Taim-Weser
 Konecranes
 NFM Technologies
 Reel
 SMS Demag
 Kranbau Köthen
 Koch
 Jaso
 Konecranes
 ...

RAILWAY INDUSTRY

Faiveley
 Knorr-Bremse
 Poli
 Qinetiq-UK
 ...

HARBOURS

Cargotec
 Port de Dunkerque
 Port du Havre
 Ports autonomes
 Rijkswaterstaat sea-lock

OTHERS

Karl georg
 Alstef
 CORDM
 Poma
 RBG
 Groupe Fives Stein
 ADF
 Endel
 Lafarge
 Baudin Château Neuf
 ISRO
 STAHL Cranesystems
 Seval
 ...

INNOVATION
CMF
RENOVED
INDUSTRIAL APPLICATIONS

STEEL INDUSTRY



Handling crane

HARBOURS AND SEA-LOCKS



Harbour gantry crane wheels

OTHERS



Wheels for stadium decks



Wheels \varnothing 1.200 mm on a drive axle of a steel ladle transfer car



Wheels at a Sea-lock door in The Netherlands



Rocket Launching Pad (Indian Space & Research Organization)

BENEFITS FOR INDUSTRIAL CUSTOMERS

- ✓ Renowned trademark worldwide
- ✓ Long lifetime products for reduced Total Cost of Ownership (TCO)
- ✓ Reliable components to guarantee a high availability ratio
- ✓ Broad range of forged mechanical components for industrial applications
- ✓ From tailor-made to serial parts
- ✓ 'Can do' attitude to meet customers expectations
- ✓ Expertise and technical support capabilities



CONTACTS

MG VALDUNES

Usine des Dunes
CMF Sales Department
59495 Leffrinckoucke (France)
Phone : +33 (0) 3 28 69 97 00

CMF Sales Department

Samuel VILLANI
samuel.villani@valdunes.com

CMF Sales Administration

Nathalie FERMAUT
nathalie.fermaut@valdunes.com



INNOVATION
CMF
RENOUNDED
INDUSTRIAL APPLICATIONS



**THANK YOU FOR
YOUR ATTENTION**
ANY QUESTIONS?

MG-VALDUNES
Rue Gustave Delory – 59125 – Trith Saint Léger – France
Tel: +33 (0)3 27 23 62 62 – E-mail: info@valdunes.com

www.valdunes.com