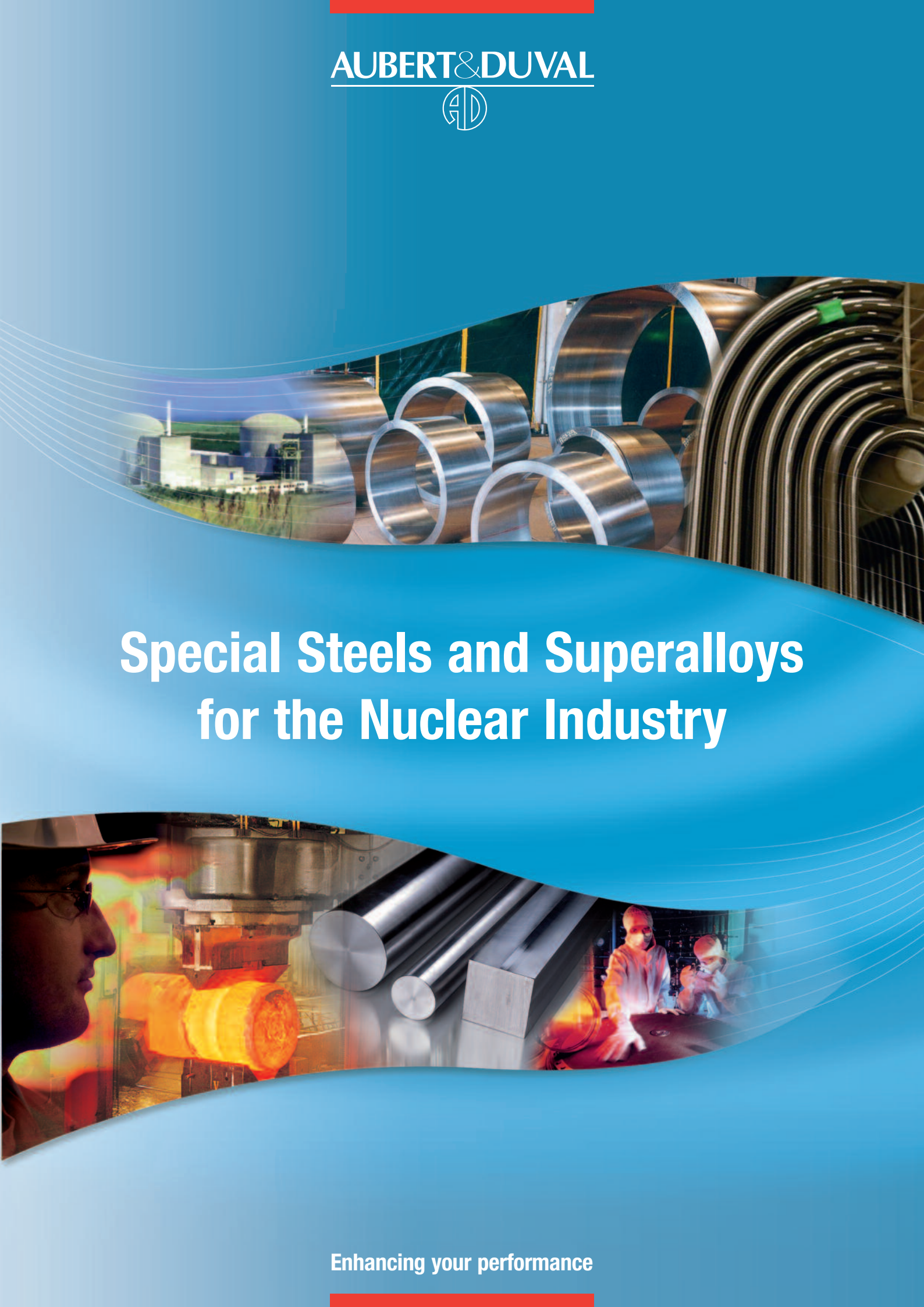


AUBERT&DUVAL



Special Steels and Superalloys for the Nuclear Industry

Enhancing your performance



Our pledge: **your satisfaction**

Committed to support the “renaissance” of the nuclear industry

To meet the requirements of several hundred plants to be built in the next 10-20 years, Aubert & Duval will provide products optimized for this safe, clean and reliable environment.

A long history

For almost 50 years, Aubert & Duval has been partnering with French Areva to develop forged and rolled products ideally suited for the nuclear market. Sales of alloys and superalloys have progressively expanded across a range of primary circuit makers, or their subcontractors throughout the world : Areva, Jeumont (JSPM), Valinox, Fives Nordon, Velan, Senpec, MHI, Ensa, Doosan, Harbin Electric Co,...

Qualified Products and Process

Aubert & Duval follows the most stringent requirements in terms of grade composition, material integrity, dimension tolerances and quality control.

Therefore all our products are nuclear-certified.

Aubert & Duval has many RCC-M M140 (parts level 1) qualifications and qualified (material organisation) according to ASME Code Subsection NCA 3 800.

Our plant laboratories are ISO 17025 accredited by a third party

Development

Whether in the frame of new projects (BWR, EBWR, ABWR, ITER, JHR, waste treatment, etc.) or new products (elbows for primary circuit, etc.), Aubert & Duval wants to continue its leadership of this market. With R&D equalling 2% of turnover spent every year, and with dedicated investments, such as milling machines, lathes, heat treatment furnaces and control equipment, Aubert & Duval ensures that it remains competitive in terms of performance, quality and cost.

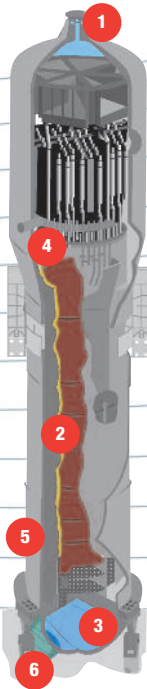
In cooperation with its sister-company Erasteel, a leading manufacturer of high cleanliness gas atomized metal powders, Aubert & Duval can also design customized solutions for small and medium sized highly stressed near-net-shape or bimetal HIP components.



(ISO 9001 version 2008
EN9100 version 2003 / AS9100B
AQAP 2110 Édition 3 (2009), ISO TS 16949 version 2009...)

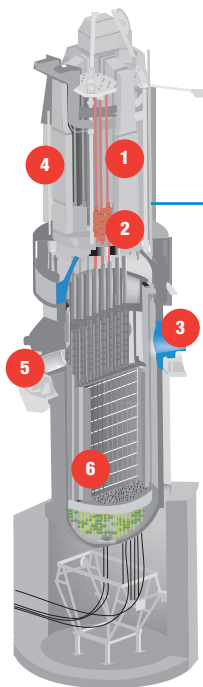
A Proven Record in Nuclear I

With a proven record in the nuclear industry,
Aubert & Duval offers metallic solutions for every situation.



STEAM GENERATOR

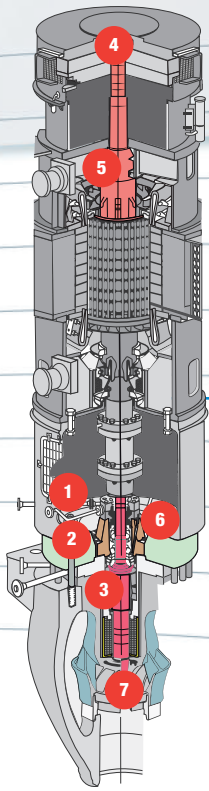
- 1 Flow limiter
- 2 Raw material for tubes
- 3 Partition Plate
- 4 Anti vibration bars
- 5 Nozzles and Manways
- 6 Safe end Nozzles



NUCLEAR REACTOR

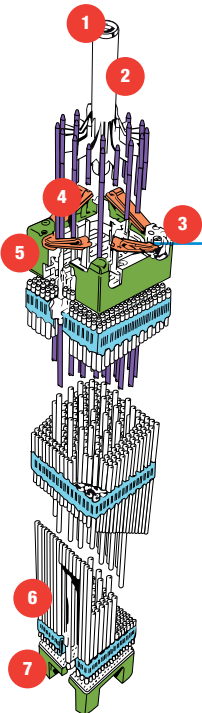
- 1 Adaptator flanges
- 2 Raw material for adaptator sleeves
- 3 Safe end Nozzles
- 4 Latch housing for CRDM
- 5 Bars for bolts, nuts and washers
- 6 Support blocks

Reactor, generator, cooler pu
forged tubes (primary circuit and



COOLER PUMP

- 1 Seal Housing
- 2 Pump Shaft
- 3 Thermal barrier
- 4 Disc for flywheel
- 5 Motor Shaft
- 6 Main Flange
- 7 Diffuser Flange



FUEL ASSEMBLIES

- 1 Rolled round bar
- 2 Rolled round bar
- 3 Rolled round bar
- 4 Rolled flat bar
- 5 Forged square bar
- 6 Rolled sheet
- 7 Rolled square bar

ump, fuel assemblies, connections,
and surge lines), elbows, valve bodies.

A Dedicated and Complete Offering

To meet the variety of needs of the nuclear industry, Aubert & Duval has built an extensive product offering. It provides the optimum combination of expected functionalities: corrosion and high-temperature resistance, shock and wear-resistance, radiation shielding, durability and performance.

Ni-superalloys

Grade	UNS Ref	Application(s)
600	N06600	Steam generators, reactor vessel
690	N06690	Steam generators, reactor vessel
718	N07718	Nuclear fuel assembly
X750	N07750	Fuel assembly

Martensitic Stainless Steels

Grade	AISI Ref	Application(s)
X13BC – X13M – X13E – X13MA	AISI 410	Antivibration bars
APX4	W1.4418	Valve rods, fittings
X17U4	AISI 630	Valves

Austenitic Stainless Steels

Grade	Application(s)
AISI 304L/304L*	Cooler pump, fuel assembly
AISI 316L/316LN*	Cooler pump, fuel assembly, tubes for primary circuits + surge lines, Valves, steam generators, Pressurizers
AISI 347	Cooler pump
ASTM A 286	Fuel assembly

* the composition of these grades is tolerance-customized for the nuclear industry

Specialty Alloyed Steels

Grade	Application(s)
AISI 4340	Reactor vessel, Cooler pump
ASTM A508 Gr. 3	Reactor vessel, steam generators, Pressurizers
ASTM A508 Gr. 4N	Cooler pump
ASTM A350 LF5	Transportation vessels for spent fuel
ASTM F22	Steam Generators

All our Grades have a low-cobalt content

Shapes and Dimensions

Forged Specific Parts: L maxi 20m, Ø maxi 1,000 mm

Regular Bars: Ø 7.5mm up to Ø 190mm

Anti Vibration Bars: adapted to PWR 900 MW, CPR 1000 and EPR-types

Sheets and Plates: 2,000 mm x(1000 up to 4,000 mm) and thickness between 0.5 and 150 mm

Products can be delivered rough or fully-machined, or even ready-to-install, like anti-vibration bars.



The information and the data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes. Aubert & Duval's liability shall not extend, under any circumstances, to the choice of the Product and its consequences.

Realisation : Makheia Affinity, Aubert & Duval 03-2011
Credit photos : Jean-Philippe Ehrmann

Contact us:
www.aubertduval.com

a member of
ERAMET

