

THE ASSEMBLY **EXPERT**



**Design & production of fastening and binding elements
through hot forging, machining and thread rolling.**



ANDRÉ LAURENT
THE ASSEMBLY EXPERT

OUR HISTORY TRADITION AND PROGRESS

The company founded in 1967 by André Laurent with 4 people, specialized first into forging technology. In the course of time the manufacturing of special screws and bolts as well as mechanical assembly parts has been developed.

Nearly 50 years later the family owned company with about 150 employees has become a system supplier and expert in mechanical assembly engineering. Jean-Jacques Laurent having initiated exports activities in the 90's and son of the company's founder, is now leading the company according to the same core values of respect, responsibility, solidarity, and communication with a clear international vision.

Expertise in Hot forging and Cold thread rolling - a must in the production of secure and high quality products, is steadily consolidated by investments in machinery and equipment, personnel training as well as technical support from our Design & Development Department.

The Saint-Etienne district has traditionally been France first region for Industrial Design, and mechanical engineering due to its historical background. Today with a network of more than 150 specialized companies, represented by the high-tech centre METALINK / MECALOIRE, ANDRÉ LAURENT can revert to an excellent know-how guaranteeing high flexibility and quality. Furthermore we are active member of the following associations:

- **French association of the aerospace industry GIFAS**
(Groupement des Industries Françaises Aéronautiques et Spatiales, www.gifas.asso.fr)

- **France China Electricity Partnership (PFCE)**
www.pfce-online.com

//PROFESSIONALLY SPEAKING//



Hot forging. This is a historical skill of the André Laurent SAS and we are now able to achieve a gross forging tolerance of 0.1 mm.

Threading. We carry out external threading, by cold rolling process after heat treatment up to 1300 Mpa and internal threading on Inconel.

APPLICATIONS OF OUR PRODUCTS



Diesel and gas engines, turbo compressors



Turbine and pump technology



Nuclear power plant technology



Offshore industry



Aerospace and aircraft industry



Civil protection and defence



Railway technology and materials handling

COMPLEX AND CRITICAL PRODUCTS

MOTIVATE OUR DEDICATION TO QUALITY,
RESPECT AND EXPERTISE



//PROFESSIONALLY SPEAKING//



Our metallurgical laboratory drives improvements in our manufacturing processes: tensile tests, resilience tests down to -120°C, micrography, macrography, chemical analysis by optical emission spectrometry, microhardness tests and ultrasonic inspection.

Safran Group. This client has shown their confidence by granting us sole-supplier status for certain critical parts, whereas they normally use two suppliers in order to guarantee quality and reactivity.

//PROFESSIONALLY SPEAKING//



Directives issued for the dismantling of nuclear power stations in Germany stipulate tightening operations to ensure that the sealing of Nuclear storage casks (for the transport of radioactive materials) remains faultless over time. This explains the importance of our «intelligent screw» device, which is used to maintain and monitor the tension in screws.

OUR QUALITY ACCURACY AND CONTROL



Connecting, binding and fixing engineered components used in jet turbines, hydropower, diesel and gas engines, high-pressure pumps or heavy-load lifting equipment, are exposed to ever bigger loads and higher mechanical strains. They ensure the safety of these equipments' functions.

During and after production, our products are subject to regular and numerous controls. The following quality controls can be carried out in our in-house laboratory:

DESTRUCTIVE TESTS:

- Tensile tests:
 - Tensile strength test at room temperature
 - Angular tensile test
 - Proof load test
 - Tensile test on entire screw
- Hardness tests HB/ HR/ HV
- Impact test at room temperature and until -120 °C
- Microscopy to check material structure, thickness measurement and grain size
- Macrography to check the material fibre course

NON-DESTRUCTIVE TESTS:

- Magnetic particle inspection
- Liquid penetrant inspection
- Ultrasonic test
- Material identification by optical emission spectroscopy

Additionally the approval tests take place in cooperation with our own experts and the respective classification societies as ABS, BV, CCS, DNV, GL, LRS and RINA.

Our sub-contractors and suppliers are regularly audited following a strict selection procedure. Traceability is guaranteed by a consistent marking completely documented in our system – starting from raw material to the finished product. Material and production flow are optimized through a dynamic production scheduling software (MRP-System).

OUR CERTIFICATIONS:

ISO 9001: 1988 - ISO 14001: 2000
EN 9100: 2009
AD-2000 Merkblatt W0
Bureau Veritas - Germanischer Lloyd
Lloyd's Register

OUR PERFORMANCE

MANUFACTURING PROCESS OF HOT FORGING

Video also on our Website www.andre-laurent.fr

EQUIPMENT:

- Screw presses from 100 tons to 800 tons
- Induction and conduction heating devices (upsetting the initial diameter up to 20 times)
- Own tooling: in-house design & manufacturing, 48h service

CAPACITIES:

ø head: 8 - 200 mm
ø body: 8 - 120 mm
Length: up to 1000 mm

Feasibility and processing are simulated in advance via special software (Forge 3). The production of tools made from special steel or carbide using spark erosion is integrated as well. Temperature control via infra-red camera ensures the quality of the forging.

ADVANTAGES OF DROP FORGING:

- **Increase the resistance of the products:**
The forging process creates a dense and homogeneous structure and a continuous fibre course.
- **Manufacturing of one-piece components.**
- **Reduction of the machining time.**
- **Savings on raw material.**



//PROFESSIONALLY SPEAKING//



Our workshop has never ceased to evolve and is now fully integrated and automated with digitalized equipment. Examples of this can be seen in our rolling shop, which is 100% numerically controlled, and cells which are robotised, allowing us to achieve significant savings.

OUR PERFORMANCE

MANUFACTURING PROCESS OF MACHINING



TURNING & MILLING

EQUIPMENT:

- CNC lathes
- Robotized production units

CAPACITIES:

ø 8 - 350 mm
Length: up to 3000 mm

APPLIED TECHNOLOGY:

- SPC (Statistical Process Control) for improving our manufacturing process
- SMED (Single Minute Exchange of Die) for optimizing our performance rate

Our software Solidworks and Mastercam allow a fast information exchange with our customers for a constant optimization of our manufacturing processes.

GRINDING

EQUIPMENT:

- CNC grinding machines between-centers
- Centerless grinding machines

CAPACITIES:

Centerless: ø 8 - 100 mm
Between-centers: ø 8 - 250 mm
Length: 1200 mm

TOOTH CUTTING

EQUIPMENT:

- Hobbing machines

CAPACITIES:

ø 12 to 900 x 1500 mm
with modules 0.5 to 16

//PROFESSIONALLY SPEAKING//



Our clients seek to reduce their numbers of suppliers, which encouraged us to develop our network of foreign partners, with a procurement bureau in China for more than 8 years, in order to offer low-cost solutions while controlling the production of highly critical parts in our workshops.

EPR's in Great Britain. The last complex components are produced in our Moroccan factory (stamping, machining and rolling), while more complex parts are made in our French workshops (forging, machining and rolling).



OUR PERFORMANCE MANUFACTURING PROCESS OF THREAD ROLLING

Video also on our Website www.andre-laurent.fr

EQUIPMENT:

- CNC-rolling machines from 20 tons up to 100 tons
- 300 sets of rolling tools to produce all kinds of thread profiles, before or after heat treatment

CAPACITIES:

ø 6 - 250 mm

ADVANTAGES OF THREAD ROLLING:

- Higher fatigue resistance: The cold thread rolling process ensures maximum compression through cold forming, consequently increasing the resistance on this thread and eliminating micro-failures being done by the conventional cutting process.
- Continuous fibre course and strain hardening of the surface
- Improvement of surface finish
- Reduction of the machining time
- Mastering of thread rolling process (no tool wear)

OUR PERFORMANCE MANUFACTURING PROCESS OF ASSEMBLIES

EQUIPMENT:

Semi-automatic setting: MIC/ MAC process

CAPACITIES:

ø 400 x 2000 mm.

These techniques come in addition to our core manufacturing processes to undertake the complete management of assemblies after drawing and specification.



OUR STRATEGY FOCUSING ON OUR CUSTOMERS

Personal dedication of each employee has always been a basic principle at ANDRÉ LAURENT. Responding to questions of our business partners and considering every possible solution are taken for granted.

Increasing logistic requirements like shorter lead times, just-in-time and KanBan deliveries are demanding rapidity, accuracy and innovative methods of organization.

By means of a motivating management, a smooth and open communication, ANDRÉ LAURENT meets this challenge by a committed assignment of responsibilities.

In order to meet market's requirements, we invest 5-6% of the annual turnover into our staff's training and into machinery and equipment. After financial control and evaluation of customer-related projects, we check up the utility of investments in order to respond to special demands.



//PROFESSIONALLY SPEAKING//



ALSTOM CREUSOT RAIL. We succeeded in halving the cost of a part by forging a tube rather than a bar, thus eliminating the extra costs of drilling and additional machining, and avoiding the significant wastage of material.

GTT. As a response to a problem relating to the strength and water-tightness of the double hulls of methane tankers, we designed a product to replace two assembled parts by a single forged part, resulting in greater strength, improved mechanical characteristics and lower cost.

OUR PERFORMANCE HEAT & SURFACE TREATMENT

Surface Treatment	Heat Treatment	Thread Profiles	Standards
Electroplating Zinc coating Lamellar zinc coating Phosphating Anodizing PVD-coating (chromium nitride) Carburization Sandblasting Shot-peening GEOMET coating Xylan-Xylar Delta-Seal-Delta-Tone	Normalization Annealing Relieving Quenching and tempering Over-hardening Ageing Nitriding Case hardening Surface hardening	ISO metric threads UNC / UNS threads Withworth threads Trapezoidal threads Round profiles Special profiles <i>Application before or after heat treatment</i>	ISO (NF & DIN...) ASTM & ASME BS RCC - M & RCC - EV

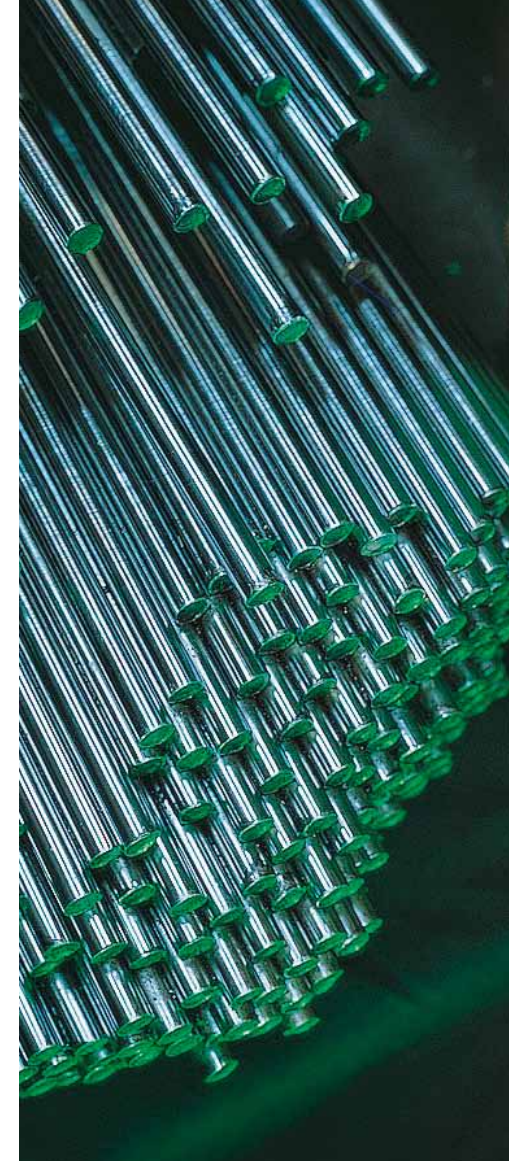
OUR PERFORMANCE APPLIED MATERIALS

In order to supply in short-term, we keep a permanent stock of raw materials on a surface of 900m²:

- 1.500 tons raw material
- 500 different diameters in more than 100 grades and alloys

Hereafter our mainly used materials which are constantly kept on stock. Depending on products and inquiries, unlisted materials are procured as well.

Stainless Steel				
Material nr.	EN	UNS	ASTM	AISI
Martensitic steel:				
1.4005	X12CrS13	S 41600	A194 Gr 6F	416
1.4006	X12Cr13	S 41000	A194 Gr 6	410
1.4021	X20Cr13	S 42000	-	420A
1.4028	X30Cr13	S 42020	-	420B
1.4057	X17CrNi16-2	S 43100	-	431
1.4313	X4CrNi13-4	-	-	-
1.4418	X4CrNiMo16-5-1	-	-	-
1.4731	X40CrSiMo10-2	-	-	-
1.4913	X19CrMoNbVN11-1	-	-	-
Precipitation hardened steel:				
1.4542	X5CrNiCuNb16-4	S 17400	A564 Gr 630	-
1.4980	X6NiCrTiMoVB25-15-2	-	A453 Gr 630	660
Ferritic steel:				
1.4016	X6Cr17	S43000	-	430
Austenitic – ferritic steel / Duplex:				
1.4362	X3CrNiMo23-4	S 32304	-	-
1.4460	X3CrNiMoN27-5-2	S 32900	-	329
1.4462	X2CrNiMoN22-5-3	S 31803	A182 Gr F51	-
1.4507	X2CrNiMoCuN25-6-3	S 32550	-	-
Austenitic steel:				
1.4305	X8CrNiS18-9	S 30300	A194 Gr 8F	303
1.4307	X2CrNi18-9	S 30403	-	304L
1.4404	X2CrNiMo17-12-2	S 31603	-	316L
1.4539	X1NiCrMoCu25-20-5	S 08904	-	904L
1.4541	X6CrNiTi18-10	S 32100	A194 Gr 8T	321
1.4571	X6CrNiMoTi17-12-2	S 31625	-	316Ti
1.4845	X8CrNi25-21	S 31000	-	310



OUR PERFORMANCE APPLIED MATERIALS

Nickel alloys & Non – ferrous metals				
Material nr.	EN	Description	UNS	ASTM
Nickel alloys				
2.4856	NiCr22Mo9Nb	Inconel 625	N06625	B444-446
2.4668	NiCr19NbMo	Inconel 718	N07718	-
2.4360/2.4366	NiCu30Fe	Monel 400	N04400	-
2.4631/2.4952	NiCr20TiAl	Nimonic 80A	N07080	B637
2.4819	NiMo16Cr15W	Hastelloy C276	N10276	-
Titanium				
-	-	T40	-	B348
-	-	Ta6V	-	B348
Aluminium				
3.0255	Al 99.5	1050	-	-
3.1325	AlCu4MgSi	2017	-	-
3.2315	AlSi1Mg	6082	-	-
-	AlZnMgCu	7049	-	-
Copper				
-	-	CuA1	-	-

Construction steel	
Material nr.	EN
1.1151	C22
1.1221	C60
1.0117	S235 J2
1.0577	S355 J2

Material nr.	EN	AISI
1.2343	X37CrMoV5-1	H11
1.2379	X153CrMoV12	D2
1.2767	X45NiCrMoV12	-
1.2842	90MnV8	-

Steel for quenching and tempering			
Material nr.	EN	ASTM / AISI	BS
1.6580	30CrNiMo8	-	823 M 30
1.6582	34CrNiMo6	-	816 M 40
1.6747	30NiCrMo16-6 [Air 9160]	-	835 M 30
1.6773	36NiCrMo16	-	-
1.7218	25CrMo4	-	4130
1.7220	34CrMo4	-	708 A 30
1.7225	42CrMo4	A193 Gr B7	708 M 40
1.7707	30CrMoV9	-	-
1.7709	21CrMoV5-7	-	-
1.7711	40CrMoV4-6	A193 Gr B16	-
1.6562	40NiCrMo7-3	A320 Gr L43 A564 Gr B24	4340
1.1303	35MnV6	-	-
1.3505	100Cr6	E 52100	-
1.8159	51CrV4	6150	-

//PROFESSIONALLY SPEAKING//



BRUSH. In response to an emergency situation requiring delivery to an offshore platform in less than one month, we delivered 500 M90x410 parts within the required time limit and to the specified quality after procuring the materials, mobilising our teams, opening the factory during the holiday period and finding the appropriate surface treatments.

7 good reasons for choosing «*André Laurent*»

1

EXPERTISE – SKILL

TO MATCH YOUR REQUIREMENTS

Our expertise results from a constantly-evolving rigour.

2

QUALITY – SAFETY

FOR YOUR CONFIDENCE

We have served clients since the company was founded almost 50 years ago.

3

REACTIVITY – PROVIDING SOLUTIONS

CUSTOMER RELATIONSHIPS AT THE CORE OF THE BUSINESS

The customer relationship starts from the first contact.

4

DURABILITY – REPUTATION

THE ROBUSTNESS OF A STORY ALMOST 50 YEARS OLD
Our reputation has been built on customer satisfaction.

5

BREADTH OF OFFER

PUSHING BACK THE LIMITS ON YOUR BEHALF

Our facilities, skill and sense of service support the broad scope of our offer.

6

PRICE – QUALITY

WORKING TOGETHER TO FIND THE BEST SOLUTIONS
We prefer to talk about cost of ownership.

7

STRATEGY – INTERNATIONAL

CLOSER TOGETHER TO GO FURTHER

Our strategy is built on 3 fundamental principles: internationalism, innovation and performance.



ANDRÉ LAURENT
THE ASSEMBLY EXPERT

www.andre-laurent.fr

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