

BIG SCIENCE

CNIM wins a second manufacturing contract for beam tubes for the ENDURANCE upgrade program to renovate the equipment of the high flux reactor at the Laue Langevin Institute. **This contract brings to 9 the number of beam tubes entrusted to CNIM, which has just delivered a 6th to ILL under a 1st contract.**

CNIM, French equipment manufacturer and industrial contractor operating on a worldwide basis, was entrusted by the [Laue-Langevin Institute](#) (ILL), the manufacture of a series of beam tubes as part of the reactor equipment replacement programs but also the [ENDURANCE upgrade program](#). This program to upgrade ILL's equipment and infrastructure, started in 2016, will continue until 2023 with the aim of maintaining the performance of the ILL's high flux reactor.

The ILL called on CNIM for its expertise in [electron beam welding combined with its ability to weld large parts in thick thicknesses](#).

Small series manufacturing

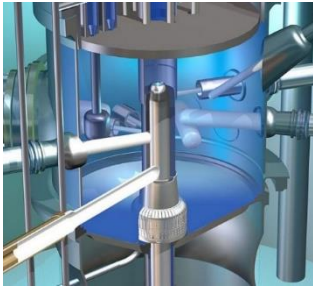
ILL entrusted CNIM with the manufacture of key equipment for its Haut-Flux reactor: the beam tubes. These **large pressure equipment for nuclear applications** (compliant with the ESPN¹ french standard) **made of Ag3net² aluminum** make it possible to extract the neutrons for a fleet of around 40 instruments and also provide a sealing function for the reactor core vis-à-vis the reactor building hall. In total **CNIM will manufacture 10 equipment, some measuring up to 4.5 m long and 1.7 m in diameter, and weighing around 2.5 tons**. The 6th was delivered in October 2021 ([see photo on the right](#)).



"This 1st contract made it possible to develop **electron beam welding processes** combining with more traditional welding processes (MIG welding), **on large-dimension, thick parts**, and this within a very constrained framework of the nuclear safety requirements imposed by the French ESPN code. » specifies Luc Torres, project manager for ILL beam tubes at CNIM Systèmes Industriels.

¹ Equipement Sous Pression Nucléaire: Under pressure nuclear equipment

² AG3NET: Aluminum alloy (zircaloy, aluminum and stainless steel). It has a certain transparency to neutrons, low activation and high mechanical strength under neutron flux



Sectional view of the core reactor of the Haut-Flux reactor © ILL

3 new equipment to be manufactured by mid-2022

In the fall of 2020, CNIM Systèmes Industriels made a new commitment alongside the research center: **18 months to manufacture 3 new beam tubes** - ESPN level 2 - for the ILL reactor in Grenoble. An option for the manufacture of 3 additional beam tubes is also planned.

Find out more about ILL beam tubes and their manufacture at CNIM Systèmes Industriels: <https://cnim.com/en/ag3net-nuclear-pressure-equipment-ills-high-flux-reactor>

For the manufacture of these beam tubes, CNIM relies on the implementation of **electron beam welding** technology, a vacuum welding process that does not require the addition of material, the welding being carried out by fusion of materials. CNIM's teams, who have [long mastered this cutting-edge technology](#), **have implemented special Ag3NET welding processes**, up to 30 mm thick, in order to meet the specific needs of the ILL.

"CNIM specializes in the manufacture of small and medium series of large-dimension products for the most demanding sectors of industry" recalls Jean-Luc Chauveau, Director of the Industrial Solutions Business Unit at CNIM Industrial Systems. "We have been using electron beam welding for large thick parts for over 30 years; and we meet the requirements of the most stringent French and international standards (EN, ASME, RCC-M, ESPN, CODAP). [We are proud to put our expertise at the service of the ILL, a world benchmark institution for neutron research.](#) "

"The replacement of our beam tubes was an essential program for the Institute and it is in this context that we consulted the CNIM, recognized for its adaptability to customer requests and its rigor in the application of the more and more demanding nuclear power standards. Beyond the contractual aspects, we have forged a real relationship of trust with the CNIM." specifies the management of the ILL.

About the Laue-Langevin Institute

World's leading facility in neutron science & technology, the Laue-Langevin Institute offers scientists around the world extremely bright neutron beams, powering some 40 very high-tech instruments used in the most demanding fields: biology, chemistry, soft matter, nuclear physics, materials science, etc. The ILL also works closely with the R&D departments of industrial companies.

CNIM's Big Science and Nuclear businesses

CNIM has been a major nuclear player for 40 years. Designer and integrator of high-performance solutions with very high added value, CNIM operates both in the entire fuel cycle and in power and research reactors. An expert in systems classified as important for nuclear safety, CNIM notably offers secure, precise and remotely operated handling systems for the operation or deep disposal of radioactive packages.

About CNIM

Founded in 1856, CNIM is a French equipment manufacturer and industrial contractor operating on a worldwide basis. The Group provides its products and services to major public and private sector organizations, local authorities and national governments in Environment, Energy, Defense, and High Technology markets. Technological innovation is at the core of equipment and services designed and manufactured by the Group. They contribute to produce cleaner and more competitive energy, to limit environmental impacts of industrial activities, to secure sensitive facilities and infrastructures, and to protect individuals and nation

states. CNIM is listed on the Euronext exchange in Paris. It relies on a stable family-based majority shareholding structure. The Group employs 2,706 people and had revenues of €632.9 million in 2020, 47.8% of which was from exports.

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