

EXIUM® AM, an outstanding damping alloy developed by the casting foundry LBI.

The highly regarded French centrifugal casting foundry, **LBI**, has launched onto the market a metallic alloy with exceptional properties.

LBI has always been a leader in the development of innovative foundry and metallurgical technologies to its customers.

With over 200 employees, LBI is a well-known supplier of cylindrical parts in stainless steels, aluminum and copper based alloys for many industrial sectors. Its casting capacities range from 5m outside diameter in vertical centrifugal casting and up to 4.5m length in horizontal casting with a maximum weight of 20T.



LBI have an integrated workshop with Vertical and Horizontal CNC lathes, enabling them to offer finish machined parts.

Following a special request of the CNES (Centre National d'Etudes Spatiales – France), LBI, in collaboration with the laboratory of the famous Ecole des Mines de Paris developed a new alloy with very high damping properties, named **EXIUM®AM**.

The particular chemical analysis, in association with an exclusive centrifugal casting process, has enabled them to achieve the outstanding properties of **EXIUM®AM**, which are most interesting between -15°C and + 50°C. Outside this range, it reacts like a cast iron.

It reaches similar damping values to Nylon (PA6) or polypropylene (PP) and dampens 10 times more than a laminar graphite cast iron, which is widely recognized and used for its damping properties.

The first industrial implementations of **EXIUM®AM** showed positive results such as : good shock resistance, noise and/or vibration absorption, commendable mechanical properties and corrosion resistance. These are the main characteristics that make this material a perfect combination in many industrial sectors and the values at the end of this article will demonstrate this.

Thanks to its productions capacities, LBI can offer this material in cylindrical shapes such as bushes and tubes and also as plates (obtained from centrifugally casted cylindrical hollow pieces).

The material offers excellent machining ability, which allows LBI to offer fully machined parts which can then be readily implemented into your sub-system.

The LBI sales team is at your disposal for all your enquiries about this technology:

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Main features of EXIUM AM:

Mechanical properties:

- $E > 240 \text{ MPa}$ - $R > 520 \text{ MPa}$ - $A > 30 \%$
- Young E Module : 80 GPA
- Torsion Module G : 34 GPA
- Poisson's coefficient: 0,25

Damping properties (ambient temperature)

- $\text{tg } \phi \sim 1,80 \cdot 10^{-2}$ (so $2\pi \sin \phi \sim 11,30 \cdot 10^{-2}$)

Absorption of the different vibrations:

- longitudinal mode (4,6 Khertz), $\text{tg } \phi = 1,51 \cdot 10^{-2}$
- flexion mode (240 hertz), $\text{tg } \phi = 1,75 \cdot 10^{-2}$
- torsion mode (2,7 Khertz), $\text{tg } \phi = 0,82 \cdot 10^{-2}$