



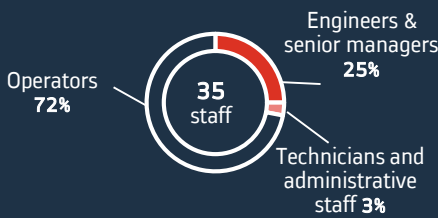
Alstom IBRE, Alstom's subsidiary since July 2020, is Alstom's Global Centre of Excellence for brake discs.



Production capacity:
About **18,000 discs/year**

6000 m² covered

25 projects under development or under study



In Saint-Denis-lès-Sens, Alstom IBRE's teams design, manufacture and supply cast iron or steel brake discs for high speed, intercity, regional and suburban trains, trams and metros, both for the French market and for export projects.

The brake disc is a critical component of rolling stock solutions. Alstom now has an in-house alternative and offers new possibilities to its customers in terms of cost, lead time and reactivity. From Sydney to Berlin to New Delhi, Alstom IBRE's unique expertise and know-how is recognized worldwide.

LOCAL FOOTPRINT AND SOCIETAL AND ENVIRONMENTAL RESPONSIBILITY

- **ISO 14001:2015** certified since May 2020
- Eco Vadis Gold Medal 2021
- **95%** of the disc mass comes from recycled material
- **95%** of production waste is recovered in controlled channels

Local partnerships: DREAL, Water Agency, ESAT Sens, Yonne CCI

REFERENCES

- **Tram:** VAL (Lille) brake discs and calipers, OrlyVAL, CDGVal
- **Metro:** MI09 (RER A)
- **Suburban:** Talent 1 (Austria), Oscar & 4 GT (Sydney), Perth (Australia)
- **Regional:** Régiolis
- **Loco:** BB36000
- **High speed:** TGV

ACTIVITIES

Product development & project management

- Research & Development
- Project offers and management
- Design
- Industrialisation
- Validation tests
- Technical expertise and retro-engineering
- Commissioning and after-sales follow-up

PROCESSES

Production / Quality

- Coring / Casting / Foundry
- Machining / Balancing / Screwing / Painting
- Non-destructive tests: dye penetrant tests, magnetic particle inspection, balancing, ultrasound, X-rays

PRODUCTS AND SOLUTIONS

The BRAKE DISCS

The brake discs, made of grey cast iron, are manufactured in the Sens foundry. They are then machined and balanced. Alstom IBRE also designs forged steel discs (TGV, regional trains). Rough forged parts are purchased then machined by Alstom IBRE.

Globally unique expertise

Alstom IBRE is in possession of a globally unique expertise enabling it to mould cast iron (body of the disc) on a forged steel hub (interface with the axle). This alloying technique combines the best mechanical properties of cast iron and steel. The concept guarantees a 50% to 100% longer lifespan, drastically reduces cracking, and significantly reduces wear, providing an LCC (Life Cost Cycle) performance that exceeds the competition.



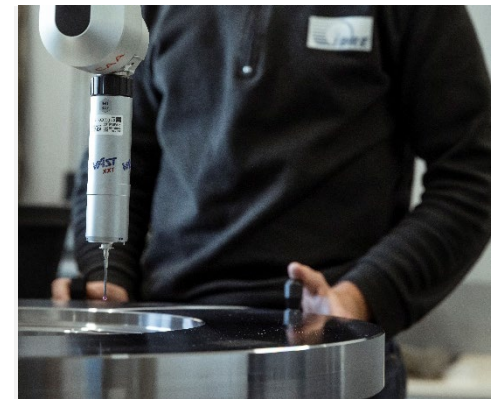
INVESTMENTS

A connected oven

To guarantee its excellence, Alstom IBRE has adopted a decisively digital and innovative approach by investing in a connected furnace. This enables real-time monitoring and temperature traceability as well as automatic adjustment of mixtures during the melting process, guaranteeing better quality monitoring.

An analysis laboratory

Alstom IBRE also uses an innovative analysis laboratory, including an X-ray, a spectrograph, a spectrometer and a 3D scanner. This state-of-the-art equipment enables complete monitoring and analysis of the brake discs, guaranteeing the quality of the product.



CURRENT PROJECTS

Metros/Trams:

- Metro: Wanda (Taiwan)
- Citadis (Arpège bogie)

Regional:

- Regio 2N (France)

High Speed

- New Pendolino (Italy)



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