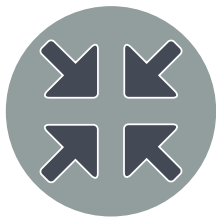
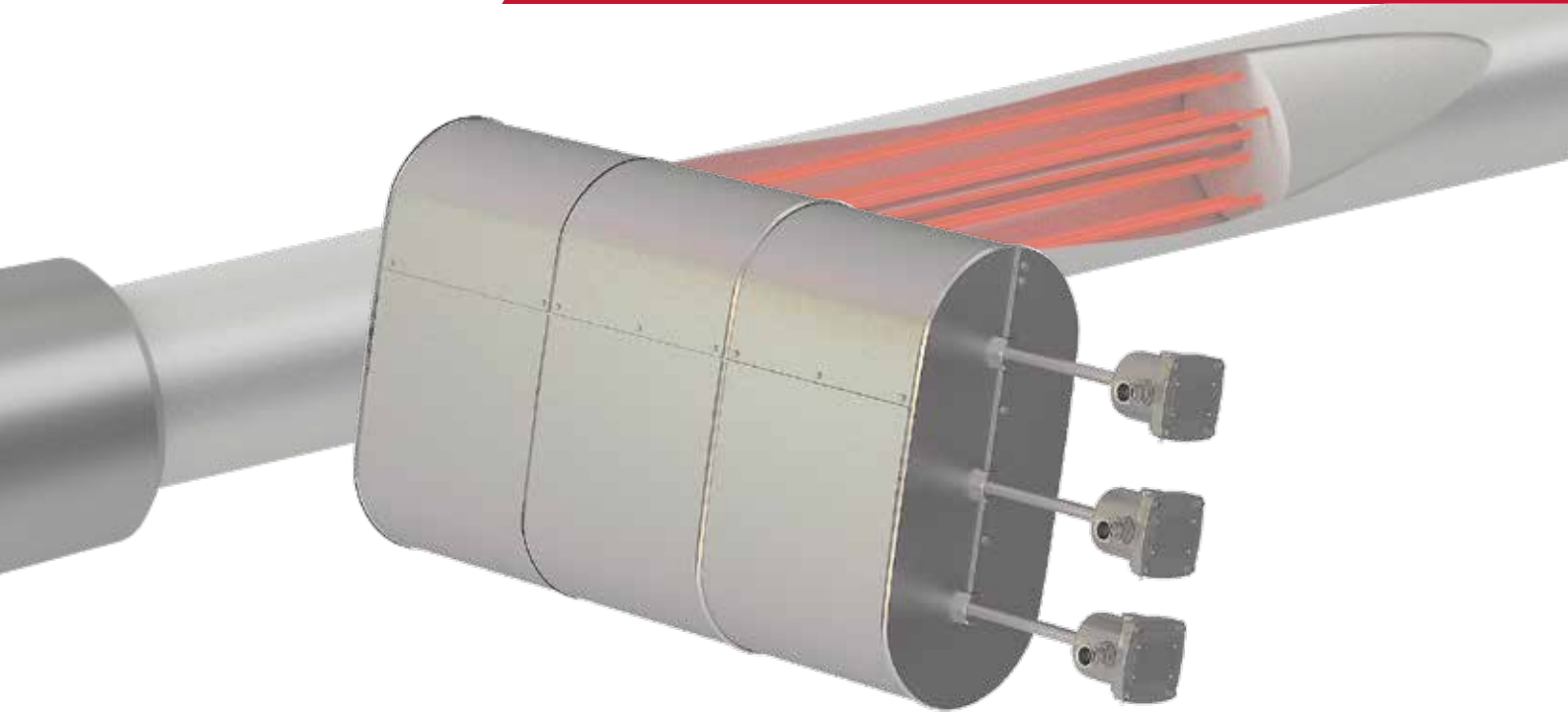




BORON NITRID HEATERS

Very High Heating Performance for the 21st Century



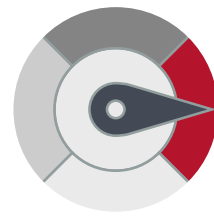
Smaller equipment

Less space, weight,
heat loss, cost saving,
reduced thermal inertia



Increased Productivity

More heat in less time
for shorter
production cycles



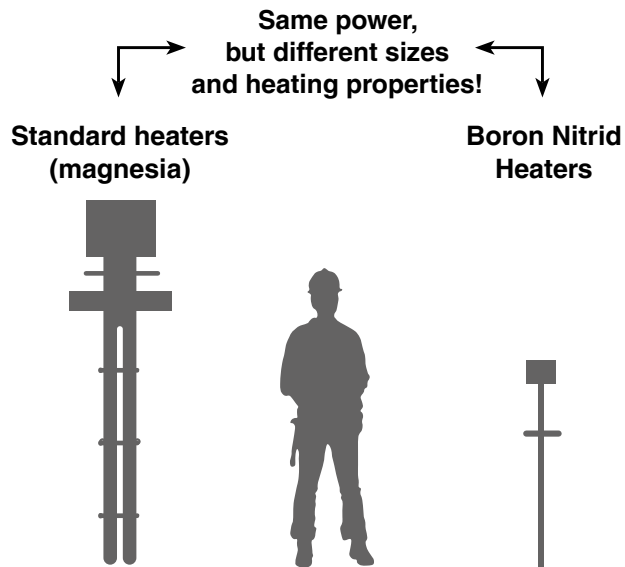
High Temperature

Longer heater life in
extreme conditions,
very high temperatures

The world is changing, and the industry of the 21st century faces new challenges!

- Productivity
- Energy saving & environment protection
- Cost reduction

Maximise your heating applications with Boron Nitrid Heaters!

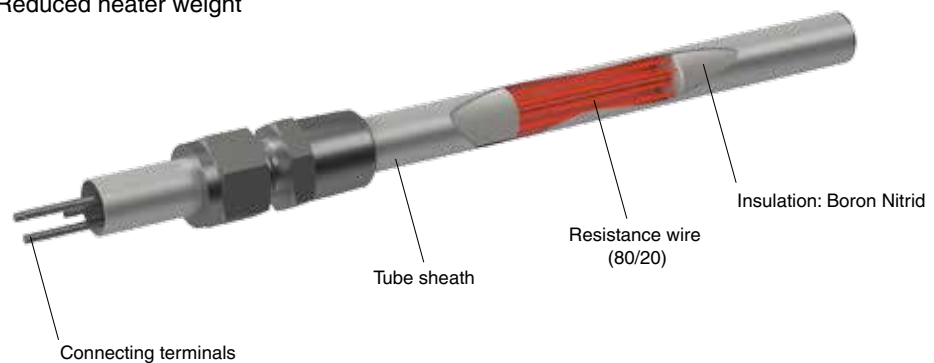


Main advantages of Boron Nitrid technology

- Temperature gradient improved by 10 compared to Magnesia
- Heating 100% homogeneous (straight wire)
- Ring-shaped flow improves heat transfer up to 100 W/cm² and more
- Available in ATEX/IECEx
- Medium voltage
- No leakage current at high temperature
- Specific tube sheath to increase heat transfer coefficient and heat surface
- Reduced heater weight

Key technical features

- Customized product
- Wire Ni-Cr 80/20
- W/cm² : 10 à 200 W/cm²
- Voltage: 24 V /48 V DC, 110 to 750 V AC/DC, others on request
- Operational temperature: from -270 °C to +1000 °C
- Pressure: up to 320 bars, higher on request



Benefits and Processes

Smaller equipment



- Complete system cost reduction (especially when vessel is under pressure (DESP), insulation)
- Space saving and easier to handle
- Weight saving
- Temperature loss reduction (surface minimized)
- Easier handling for installation
- Inertia reduced, better temperature control accuracy

Liquid heating

Improved heat transfer (up to 100W/cm²) thanks to ring-shaped vessel to reduce the size of the heating system: corrosive, polluting or thermal fluid heating / high power pressure system / high power system / Steam super heater



Braking resistors

Circulation heater for offshore platforms

Flange immersion heaters

Reduce the size of high-power flange immersion heaters while ensuring good heat transfer. For tank heating.

Increased productivity



- More heat in less time for shorter production cycles

Bolt Heaters

Bring a lot of heat in the drilled bolt to **reduce the maintenance cycle time** (tightening and untightening of the nut.)



Matrix Heating

Bring a lot of heat in the matrix to reduce the cycle time in comparison to usual cartridges

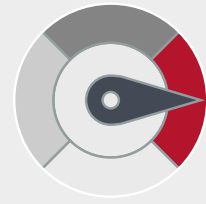
Mold Heating

Bring a lot of heat in the mold for specific thermoforming process (Aeronautics, Automobile) to reduce the process cycle time

Ignition point

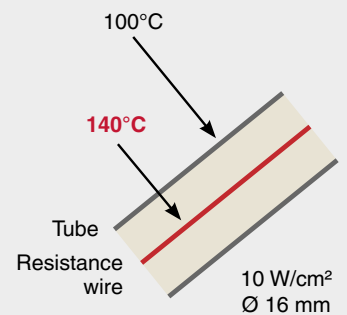
Ignition of inflammable gas using small equipment

High temperature

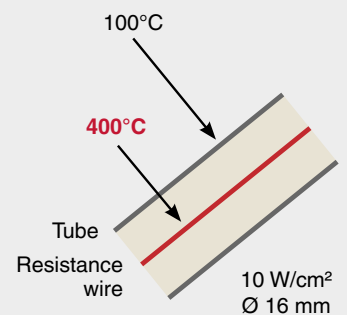


- High temperature process, up to 1000°C
- Temperature gradient improved by 10 compared to Magnesia

Boron Nitrid Heaters



Magnesia Heaters



Gas heating

Heat process requiring high temperature such as bench tests with high air flow (aeronautics ...) / chemical processes (Polymerization)

Project examples



- 900 kW 400 V
- DN200
- 750 °C
- 25 à 50 bars
- Fluctuating flow rate 0.1 to 1 kg/s
- 50 W/cm²
- in operation since 1995



- 42 kW 360 V
- 515 °C
- ATEX
- 50 W/cm²
- Pressurized cabinet

Customers references

- ALSTOM
- TOTAL
- SNECMA
- STEIN
- POWER HOUSE TOOLS
- SEICO
- DCNS
- ZETON
- LIEBHERR AEROSPACE
- CEA
- EDF
- TORAY
- CEAT
- ARCELOR

Industrial sectors

The Boron Nitrid Heaters are interesting for all industrial sectors looking for higher productivity, saving space or working with high temperature process.

Examples:

- Shipyard
- Oil & Gas / offshore platform
- Chemical industry
- Power industry
- Nuclear industry
- Packaging
- Thermoforming
- Submarine
- Aeronautics
- Aerospace