

Production facility: focus on innovation

Thales's grid tubes are designed, developed and manufactured in a production plant in Thonon, southeast France, certified to ISO 9001:2000 and ISO 14001. Spanning some 25,000 square meters of floor space, including 200 square meters of clean rooms, Thonon is recognized throughout the world as a centre of expertise for power sources. R&D teams at Thonon are working on innovative new solutions for industry.

Thales industrial tubes at a glance

- In service in 40,000 generators worldwide
- 120 million operating hours/year
- 200 different models, for all industrial applications



Richardson Electronics global support network

Richardson Electronics is the world wide distributor of Thales industrial products. RELL has been distributing electron tubes since more than 60 years and has developed the best logistic services in the industry. It now has 45 sales offices and stocking locations around the world.

For more information regarding the products, feel free to ask Richardson Electronic - www.rell.com



THALES MICROWAVE & IMAGING SUB-SYSTEMS
2, rue Marcel Dassault - BP 23
78141 Vélizy-Villacoublay Cedex - France

Phone: + 33 (0) 1 30 70 35 00
Email: rfms.marketing@thalesgroup.com

RICHARDSON ELECTRONICS, Ltd
40W267 Keslinger Road
LaFox, IL 60147-0393 - USA

Phone: +1 630 208 2200
Email: edg@rell.com

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THALES



RF industrial heating

Power grid tubes for dielectric heating



Thales, a long-standing partner to industry

With over 60 years of experience in the design and manufacture of electron tubes, Thales is the benchmark supplier to a number of industries that call on these tubes for dielectric heating. The plastic, agrifood, textile, wood and many other industries use our tubes.

We have made a two-pronged commitment to our customers: to ensure the long-term viability of tube technology, which has proven its reliability and flexibility; and deliver high-quality products, based on our expertise in the complex underlying processes. Whether for dielectric, induction or laser applications, we offer the largest range of tubes on the market, plus comprehensive support services around the world.

THALES

 **Richardson Electronics**

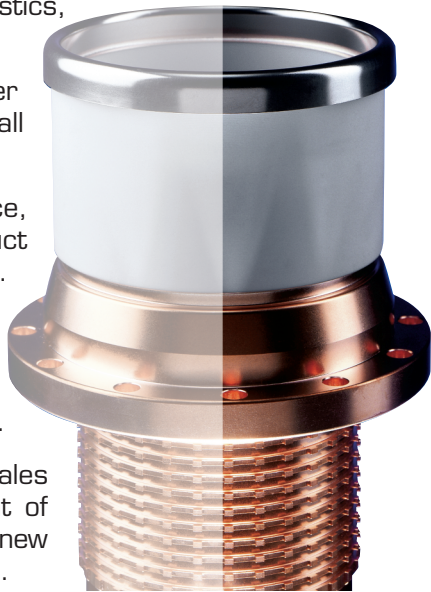
www.thalesgroup.com

The world's widest range of tubes for RF industrial applications

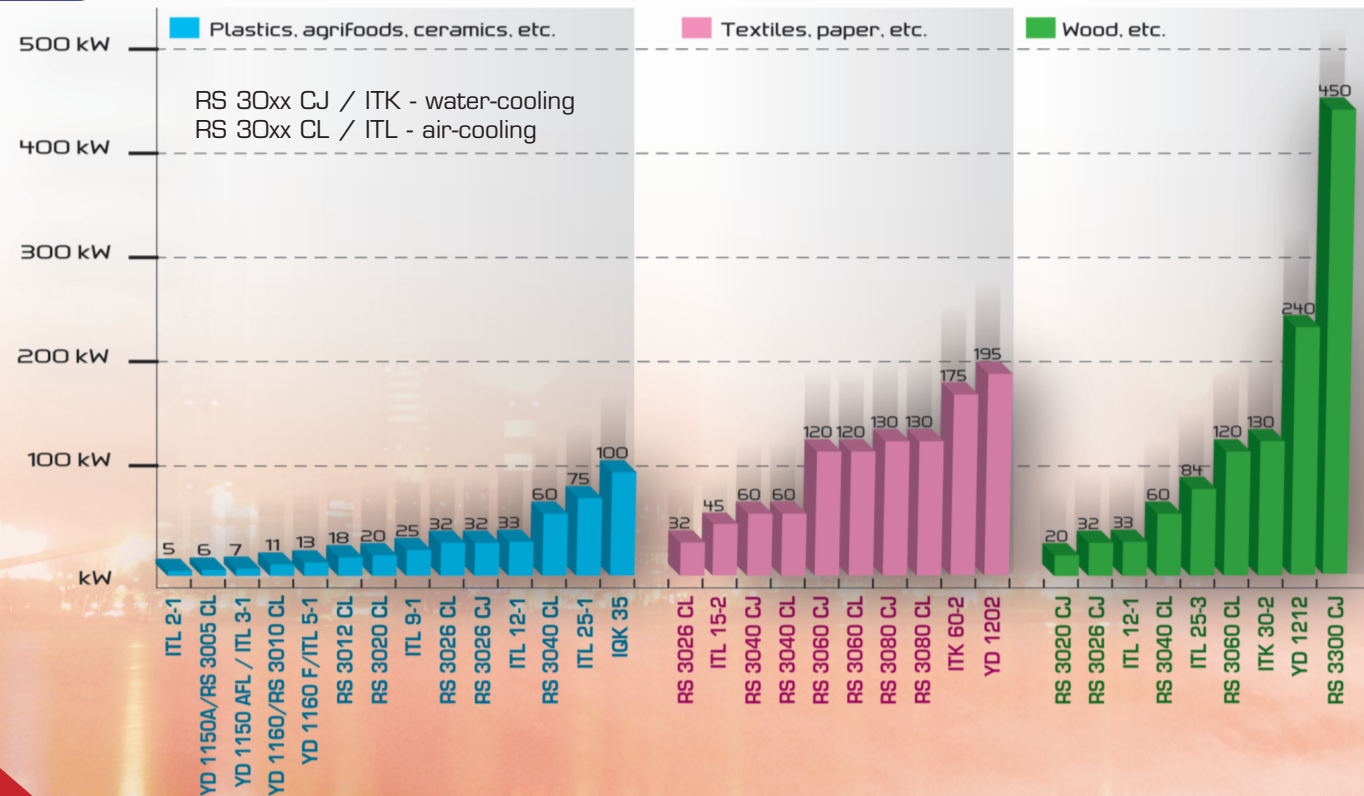
>> Thales: recognized expertise in high-power RF applications

No matter what industry you're in, you can count on Thales.

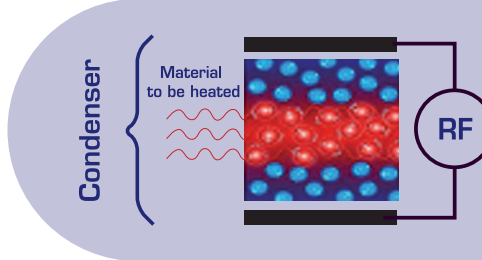
- **A range of products that covers all market requirements**, with tubes developing 500 W to 500 kW of power. This means we can meet all your needs, whether for plastics, agrifoods, textiles, wood or other applications.
- **The largest catalogue of products** : Thales is today's largest manufacturer of grid tubes for industry, with products by Thomson, ABB and Siemens all integrated in our production lines.
- **Price-quality guarantee**. All Thales products are manufactured in France, using strict component quality control procedures. We focus on product quality to ensure long operating life and reduced system maintenance costs.
- **Delivery within 48 hours**. Timely delivery is of course essential in industry, especially when you're waiting for replacement parts! At Thales, we deliver within 48 hours to keep your production lines up and running. Our worldwide distributor guarantees virtually immediate product availability from their stock.
- **Customer support and technical assistance around the world**. Thales engineers and local technical assistance teams support your development of RF industrial heating solutions. We can also custom-design products for your new systems, and provide upgrades and replacement kits for your older systems.



>> Thales' s best sellers: versatile solutions keyed to market requirements



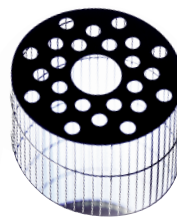
>> Pyrolytic grids, a major advance in dielectric heating



Dielectric heating, also called high frequency or RF heating, raises the temperature of non-conducting materials, drying them or melting them depending on the application. This heating process offers several advantages:

- Heats the material from the inside, uniformly.
- Self-regulating: heating stops when the material is dry.
- Dries thick pieces (such as tree trunks).
- Accelerates heating operations.
- Excellent heating efficiency.

Thales has developed a new technology for these tubes, namely the **pyrolytic grid**. Based on the crystallization of pyrolytic graphite, it produces a single-piece part, without any welds. This structure, coupled with the graphite's intrinsic mechanical properties, gives the grid a number of superior qualities:



- High thermal conductivity.
- Very low thermal dilation coefficient, for reduced space between electrodes.
- Excellent resistance to thermal shock.
- Excellent chemical stability at high temperatures.
- Good mechanical resistance, increasing with temperature.
- Low and constant electrical resistivity.
- Much lower thermal and secondary emission effects than with metallic grids.

Tubes with the pyrolytic grid stand up much longer to operating conditions involving high grid current levels. Which means that our **Pyrobloc®** tubes in high-power systems offer **better reliability** and **longer operating life**.

>> Dielectric heating: a broad range of industrial applications

AGRIFOODS
Bakery: defrosting, fermenting
Cookies: cooking, drying
Prepared dishes: pasteurization, sterilization
Fruits & nuts: grilling nuts

PLASTICS
Packaging: blister sealing
Cars: sun-visor welding
Medical: sealing of blood bags
Leisure: sealing of tarps, pools, office supplies

TEXTILES
Weaving: drying of threads, fabrics, bobbins, etc.
Coatings: curing for resin coatings
Technical fabrics: bonding

WOOD & DERIVATIVES
Furniture woodworking: drying, bending etc.
Cork: drying corks
Carpentry: insect removal from beams, framework
Glued-laminated products: bonding components

CERAMICS
Ceramic composites: sintering
Bathroom appliances: drying

PAPER, CARDBOARD
Graphic arts: ink drying
Paper, cardboard manufacture: drying of paper, bonds

FOUNDRY
Manufacture of molds: curing of mandrels, drying mold coatings

CHEMICALS - PHARMACEUTICALS
Powder products: drying
Paints, varnishes: curing
Inks: drying, dehydration, demineralization

ENVIRONMENT
Waste processing: decontamination of micro-organisms, deactivating and rendering inert hospital waste

RUBBER
Seals, rubber powders, natural latex: pre-vulcanization

**Dielectric heating:
quick, efficient, uniform**