

Production facility: focus on innovation

Thales' grid tubes are designed, developed and manufactured in a production plant in Thonon, southeast France, certified to ISO 9001:2008 and ISO 14001. Spanning some 25,000 square meters of floorspace, including 200 square meters of clean-rooms, Thonon is recognized worldwide as a center of expertise in 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 worldwide distributor of Thales industrial products. Richardson has been distributing electron tubes for more than 60 years and has developed the best logistic services in the industry with fast delivery through 45 sales offices and stocking locations around the world.

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



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> RF industrial heating

Power grid tubes for Plasma application



Thales, a long-standing partner to industry

With over 60 years of experience in the design and manufacture of electron tubes, Thales is recognized throughout the world as an expert of power sources.

Grid-controlled triodes are especially suitable for plasma production dedicated to industrial, manufacturing, environmental and engineering applications. Whatever the application and plasma source you develop or use, Thales offers tailored solutions for your plasma generator with tubes covering powers from 5 to 1,000 kW.

Reliability and performance are the key selection criteria in these applications and Thales products have been chosen by a number of leading manufacturers, with thousands of machines in service worldwide and tens of thousands of tubes already delivered.

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

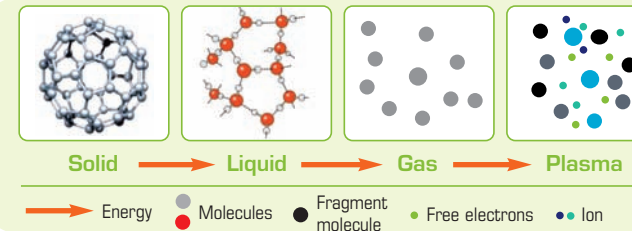
>> Thales: recognized expertise in high-power RF applications

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

- **A range of products that covers all market requirements**, with tubes developing 5 to 1,000 kW of power. This means we can meet all your needs, whether for petrochemicals, construction, automotive, aviation or other applications.
- **The largest catalog 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 24 hours.** Timely delivery is of course essential in industry, especially when you are waiting for replacement parts! At Thales, we deliver within 24 hours to keep your production lines up and running. Our exclusive local distributors guarantee virtually immediate product availability from their stocks.
- **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.



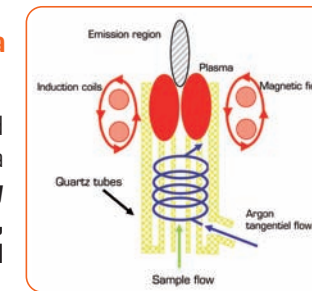
>> The 4th state of matter to serve industrial revolutions



Plasma is considered as the 4th state of matter and is known to be the most abundant form of matter in the Universe. The transformation from one state to another is achieved by supplying energy. This energy can be supplied by RF field. Atoms dissociate into electrons and ions to form a new state of matter called **plasma**, globally neutral, consisting of charged particles, neutral atoms and molecules.

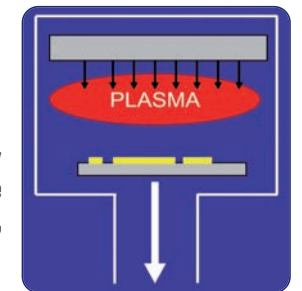
Thermal plasma

Pressure ≥ atmospheric
High collisional ionized gas: produced by an electric discharge or a plasma torch for **melting, projection of highly refractory materials for cutting, spectroscopy, or, in the environmental field, for vitrified waste.**



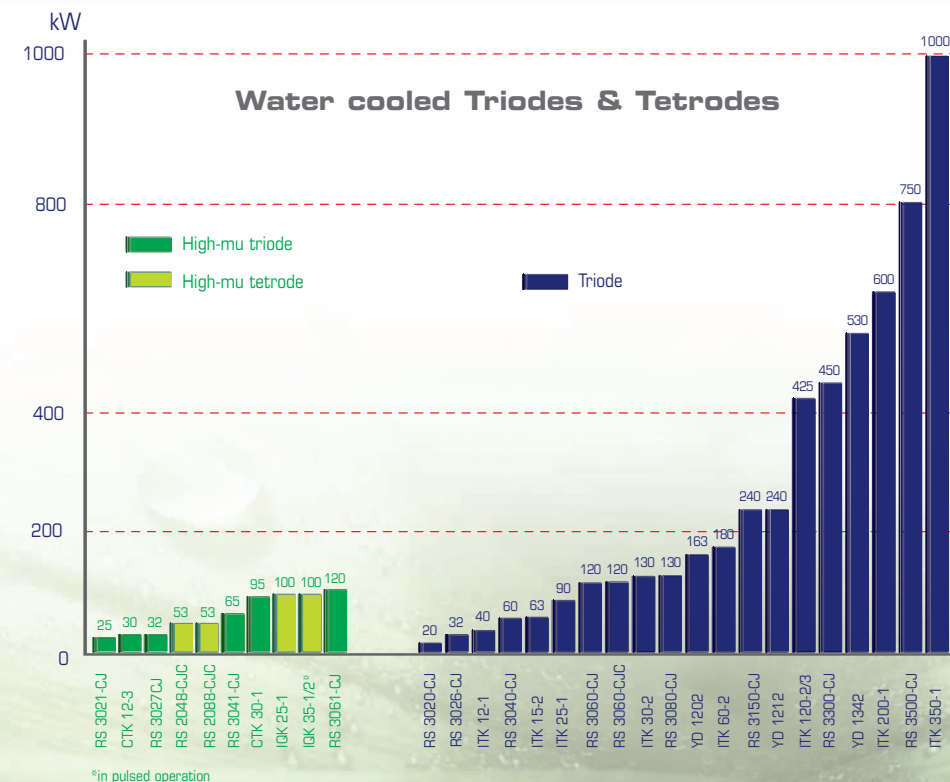
Cold plasma

Pressure < atmospheric
Low collisional ionized gas: produced in a chamber, generally under partial vacuum for **surface treatment, deposition, etching, erosion and cleaning parts.**



In line with this concern, Thales supplies RF tubes for your 13.56 or 27.52 MHz RF generator. Thales's tube-based solutions for plasma offer a very low and attractive Watt cost for applications requiring high power and high tolerance to strong impedance variations as often experienced in plasma applications.

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



>> Technical plasma: applications in most branches of manufacturing

The enormous promise of plasma technology stems from its remarkable potential for environmentally friendly and **energy saving processing; its efficient processing temperatures; its flexibility and broad spectrum of applications; and its clear ecological advantages.** These factors predestine plasma technology for sustainable development and, via innovative products and processes, open the way to new business opportunities in numerous applications such as :

TEXTILES & AGRIFOOD
Waterproofing, cleaning, reduced felting of wool, top resistance in textiles. Layers anti-bacterial for packaging and biological cleaning of food.

LIFE SCIENCE
Water purification, waste water treatment and biomolecular isolation.

MEDICAL COATING/CLEANING
Contact lenses, coronary stents, artificial joints and medical instrument cleaning and sterilization.

ELECTRONICS & SEMI-CONDUCTOR
Surface activation & treatment, vapor and thin-film deposition for bonding, potting, etching, coating and sealing processes.

Plasma processes: Productivity, efficiency, environmentally friendly

WASTE DESTRUCTION
Air treatment, decontamination cleanup, powder spheroidisation with respect to environmental policy.

PHOTOVOLTAIC
Plasma processing by deposit of thin films is used for solar panel and photovoltaic devices manufacturing.

AUTOMOTIVE
Headlight pre-treatment. Coating and bonding. Pre-treatment, cleaning and activation of car parts.

LCD & PLASMA HD TV
Plasma processing by deposit of thin films is used for LCD/LED panel manufacturing.