

**THERMOCOAX**  
POWER GENERATION



# THERMOCOAX

## POWER GENERATION



## Applications

- **EXHAUST LINE TEMPERATURE**
- **TEMPERATURE & PRESSURE RAKE**
- **BLADE TIP CLEARANCE / TIP TIMING**
- **DEBRIS MONITORING**
- **FIRE DETECTOR**
- **HEATING TO REMOVE CONDENSATION**



# Our capabilities

**Our mission is to develop state-of-the art, complete thermal solutions and this through advanced innovation from conception, to prototype development right the way through to production.**

We offer custom made thermal systems, providing our customers with safer, cleaner, cost effective and superior quality solutions.

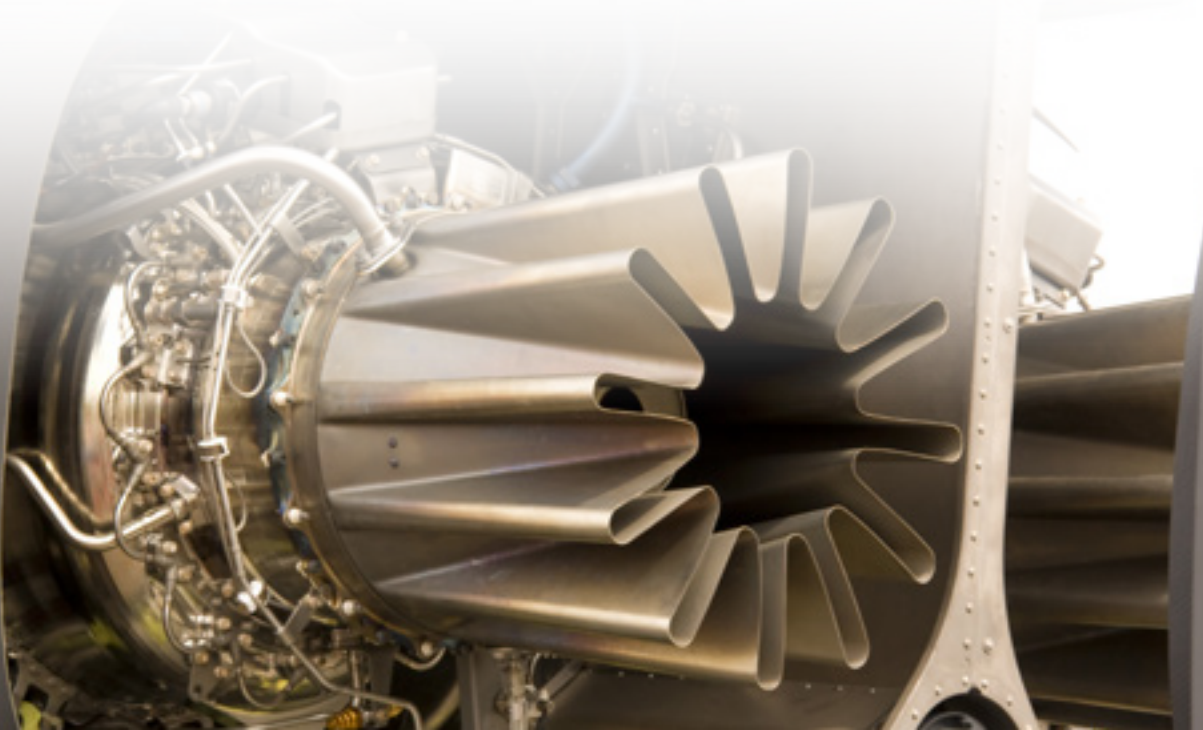
THERMOCOAX has acquired a great deal of skills and expertise to advance every demanding industry including nuclear, Oil & Gas, turbine, aeronautic.

## **COMPETENCES:**

- ▶ 3D Design / thermal modeling
- ▶ Brazing (Laser, Plasma, TIG)
- ▶ R & D and engineering projects management
- ▶ Metallographic



The industry's  
most trusted  
Mineral  
Insulated  
Cable



## Aero - Industrial - Oil&Gas

### Temperature

Thermocouples up to 2200°C

From 0.25 mm up to 6mm

For compressor, turbine, Inner Barrel, Wheel Space, combustion chamber, exhaust...

- ▶ Customized dimensions
- ▶ Total Air Temperature
- ▶ Harness, Rake
- ▶ Single, dual, triple loop
- ▶ Qualification RTCA DO 160 / MIL
- ▶ Calibration IEC, AMS2750
- ▶ ASME standard
- ▶ Stainless Steel, Inconel, Haynes, Nimonic, platinum...
- ▶ Swaged tip for fast response time
- ▶ Robust design
- ▶ High performance welding process
- ▶ Qualification test to fit the customer's specification



**LONG LIFE**



## Aero - Industrial - Oil&Gas

### Blade Tip Clearance / Tip Timing sensor

- ▶ TURBOCOAX Capacitive sensor
- ▶ High temperature 1400°C peak
- ▶ No cooling system
- ▶ Clearance from 0.01 up to 20mm
- ▶ Pseudo or Full triaxial technology
- ▶ Connected with Robust transmission cable
- ▶ High temperature 1100 °C
- ▶ Ø 1.5 to 3 mm
- ▶ Miniature version
- ▶ 15 years experience



1 400°C PEAK WITHOUT COOLING



### Gas Path Debris Monitoring sensor

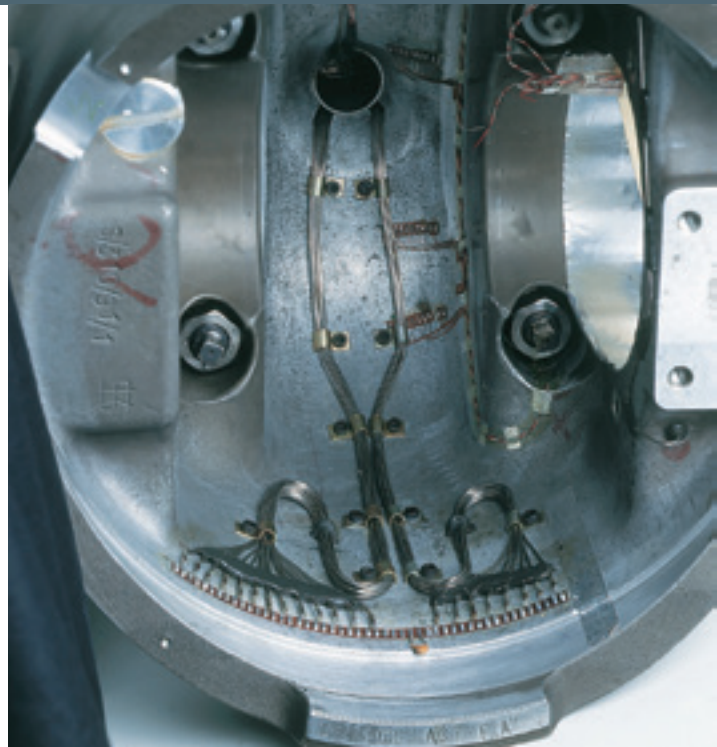
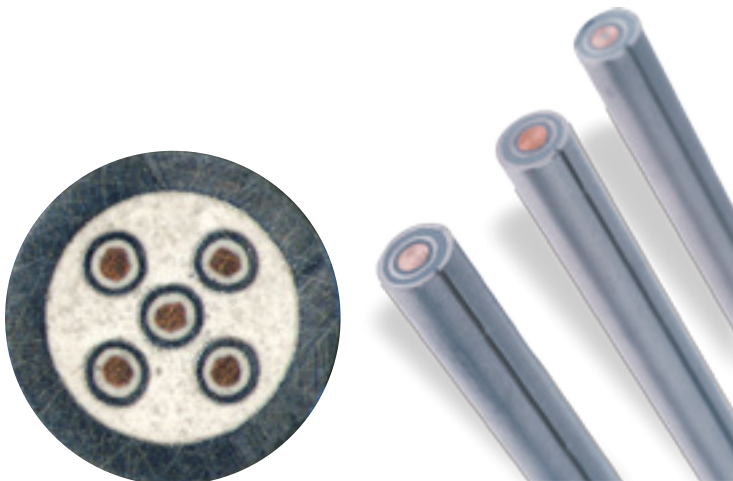
- ▶ Detection of electrostatically charged debris
- ▶ Hot section erosion
- ▶ Abradable seal rubs
- ▶ Combustor burning
- ▶ Fluid contamination (sand, dust carbon...)



## Aero - Industrial - Oil&Gas

### Signal transmission cable

- ▶ Single or multiconductor
- ▶ Coaxial 50  $\Omega$ , Triaxial
- ▶ Copper, copper plated SS304
- ▶ Inconel, constant, nickel...
- ▶ 0.25 to 6 mm
- ▶ Insulator MgO, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>
- ▶ Dielectric 1500 volts
- ▶ From 0 up to 5 Kvolt



### ELECTRICAL SIGNAL THROUGH HARSH ENVIRONMENT

### Calculator Fire detector

- ▶ on aircraft engine
- ▶ not sensitive to vibration
- ▶ Loop test before take off
- ▶ Fast response time





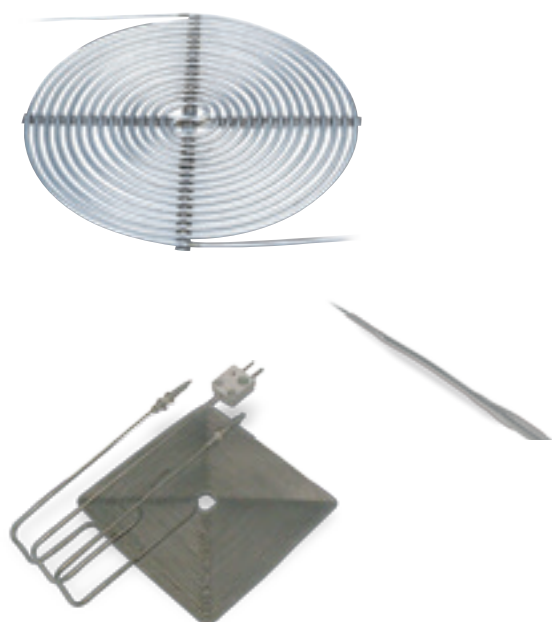


FOR BETTER INTEGRATION

## Green Energy

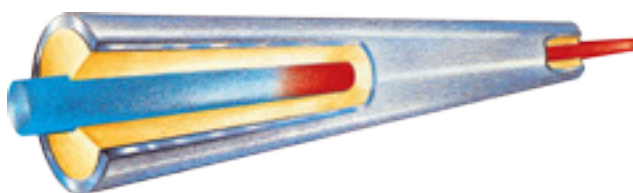
### Fuel Cell SOFC - PEMFC

- ▶ Heating element
- ▶ To initiate start sequence
- ▶ Temperature up to 1000°C
- ▶ Designed for Corrosive environment
- ▶ Thermocouple
- ▶ Haynes 230 sheath alloy  
Type N  
Class 1



### Boilers - Coal - Biomass

- ▶ Heat up fuel nozzle up to 800°C
- ▶ Safety and fast heating process
- ▶ Experience with 90Kwatt heating power
- ▶ Designed for multiple Start & Stop



**Concept, Designs using SolidWorks and computing model techniques (CMT) and Computational fluid dynamics (CFD)**

**Calibration and testing using French COFRAC certified laboratory (NIST)**

**Engineering and Project management with high qualified engineer team**



## OUR COMPANY

With nearly 60 years of experience in heating solutions and temperature measurement, THERMOCOAX has acquired a great deal of skill and expertise.

THERMOCOAX products are widely used and endorsed in many industries where the highest quality and utmost reliability are essential. All our mineral insulated cables are manufactured in-house with our proprietary and unique procedures.



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Site Planquignon



Thermocouples  
 & Heating Elements  
 ATEX  
 certified and notified

