Company brochure

Turbotect
Saint-Petersburg Ltd.

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ISO 9001:2008
Certified Management System

TURBOTECT® ТУРБОТЕКТ®

Turbotect Saint-Petersburg Ltd. was founded in 1998 in Saint-Petersburg, Russia as a fully integrated company with in-house engineering and manufacturing facilities. Turbotect Saint-Petersburg provides solutions to enable its clients to meet the increasingly demanding environmental regulations and keep the efficiency and productivity of their power plants as close as possible to the nominal values. Relying on its flexible organizational structure Turbotect Saint-Petersburg offers customised solutions for the needs and requirements of its customers. Regular field visits of its engineers secure a continuous improvement and development of the products based on the needs of its customers.

Highly qualified and skilled specialists guarantee a state of the art design, high quality engineering and efficient manufacturing in accordance with international quality standards. Reliability and quality are further secured by individually designated testing procedures. Specially trained and experienced field engineers of Turbotect Saint-Petersburg perform erection and commissioning on site.

Turbotect Saint-Petersburg builds its long-term success on extensive R&D activities. State of the art tools and equipment as well as its own test rig ascertain the access to the latest developments. The R&D department maintains a close cooperation with various technical institutes and universities in Russia as well as in Europe.

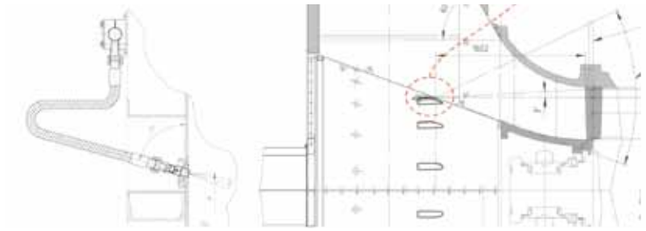
Turbotect Saint-Petersburg's headquarter and manufacturing facilities are located in the city of Saint-Petersburg.

Turbotect Saint-Petersburg Ltd. is ISO9001:2008 and its products are CE certified.

Turbotect Saint-Petersburg Ltd. has a dedicated design and computational department responsible for the development and constant upgrade of its products

Every new development passes the following stages:

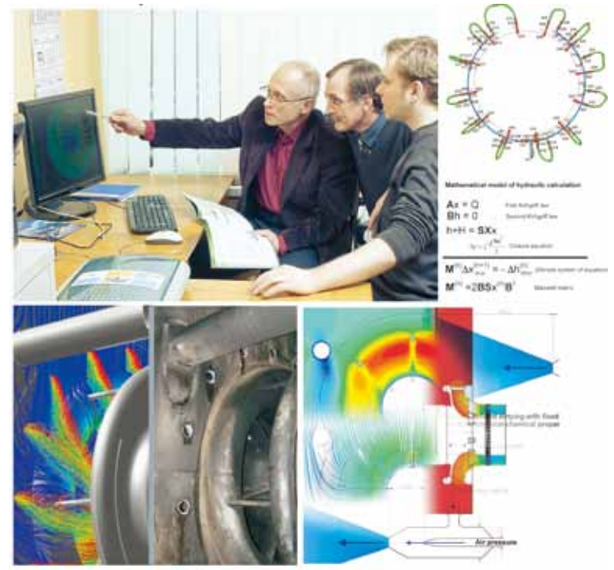
- Computational modeling (CFD)
- Pre-production model design
- Shop testing
- Industrial on-site testing
- Line production



Turbotect Saint-Petersburg Ltd. has its own unique concept of calculation for various hydraulic processes and CFD-modeling of axial compressor cleaning

CFD-modeling includes:

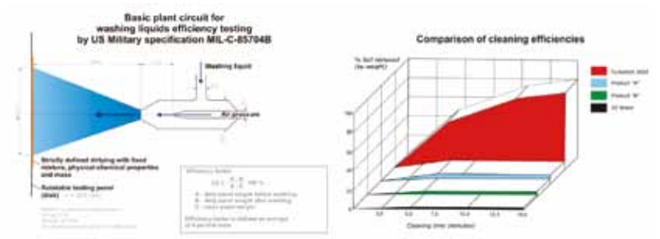
- Target setting and gathering of input data
- Geometrical and grid model construction
- Definition of the number and type of nozzles, decision about their location and alignment, definition of fluid pressures etc.
- Calculation, result analysis and evaluation



The calculation models are subject to continuous improvement and verification by experiment.

Turbotect Saint-Petersburg Ltd. has its own scientific research base including:

- Simplified air inlet duct and manifold models to simulate the compressor cleaning process
- Verification of data through nozzles and manifold mounted on test beds of various gas turbine manufacturers
- Determination of nozzle characteristics and spray behavior
- Evaluation of the efficiency of cleaners



Turbotect Saint-Petersburg Ltd. offers turnkey solutions with a dedicated team providing mounting and technical services including:

- Mounting, startup, adjustment and turnkey installation of all equipment
- Training of clients operating staff
- Guarantee and post guarantee service

Compressor wet cleaning

The objective:

- Restoration of the thermal characteristics of gas turbines, lost to degradation due to blade's fouling, to near nominal values
- Reduction of operating costs through efficiency improvement of the gas turbine

We offer:

- Integrated solutions for compressor blade cleaning using a combined technology of "ON LINE" and "OFF LINE" nozzle systems
- Cleaning systems adopted to the individual construction features of various gas turbines

The cleaning system includes:

- Set of nozzles for "OFF LINE" cleaning
- Set of nozzles for "ON LINE" cleaning
- Skid for the preparation and injection of cleaning fluid
- Cleaning fluids

The impact:
- **Preservation of gas turbine capacity (power and efficiency) at levels close to nominal**
- **Decreased fuel consumption**
- **Reduction of emissions**

Oil cleaning

We offer:

- Compact mobile oil cleaning skids with a low level of energy consumption
- 6th Class of oil cleaning according to GOST 17216, code -/11/9 according to ISO 4406, 3rd class according to NAS 1638
- Complete water removal from oil (up to 10 ppm)
- Deceleration of oil degradation
- A processing capacity of 500 liters / hour
- Hydraulic systems made of stainless steel
- Automated control of oil cleaning regimes
- Continuous lube oil cleaning during turbine operation
- Possibility to clean other non-conductive liquids

The impact:
- **Deceleration of oil oxidation, preservation of its characteristics and extension of its life time;**
- **Reduction of wear and tear of rubbing parts through immediate removal of fouling**

External cleaning of recuperator gas cooler tubes

Facts:

- Surface of gas cooler tubes gets dirty over time
- Reduced airflow from fan through tube rows
- Decrease of cooling efficiency

We offer:

- Cleaning equipment and cleaning services on request
- Treatment of up to six rows of gas cooler tubes
- Maximum efficiency during the annual maintenance

The impact:
- **Increase of airflow by up to 10 percent which means saving as much as 30 percent on electricity consumption by fan drives**

Internal cleaning of recuperator gas cooler tubes

Facts:

- Inner surface of gas cooler tubes gets dirty over time
- Decrease of cooling efficiency

We offer:

- Cleaning services and equipment
- Simultaneous cleaning of two sections

The impact:
- **Increase of cooling efficiency by up to 8 percent**

Oil-refilling

The objective:

- Filling of the skid from standard casks or oil storage tanks
- Oil transportation to the gas turbine
- Oil heating inside the skid tanks
- Refilling of gas turbine tanks and blower with oil
- Operation with two types of oil

We offer:

- Mobile skid for indoor operation
- Towed mobile skid for outdoor operation
- Towed mobile skid for outdoor operation in arctic climate conditions

The impact:
- **Convenience and flexibility of oil tank refilling**
- **Savings compared to a stationary oil supply system**

Storage tank for cleaner

A mobile unit for storage and transportation of cleaning fluid to the skid for axial compressor cleaning

Drain tank for effluent

A mobile unit for recovery, storage and transportation of drainage liquid after compressor cleaning to the waste recycling facility

Container for skid (outdoor applications)

A dedicated shell designed to protect the skid from the effects of adverse weather conditions

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