



Siemens innovative 3D optimized turbine blades and vanes for SGT5-2000E stages 3 and 4

The worldwide demand for electricity is growing continuously. At the same time an ever rising number of new regulations and laws demand environment-friendly technologies. Siemens is constantly developing new power plant technologies answering today's mega trends. Siemens gas turbines are renowned for their high availability and reliability as well as high power output and high efficiency with low emissions.

One of the innovative solutions offered by Siemens to help you improve your operating plant competitiveness and profitability are the Siemens innovative 3D optimized blades and vanes for the turbine stages 3 and 4.

Our product

Siemens innovative 3D optimized turbine blades and vanes are characterized by an aerodynamic blade and vane design with optimal efficiency as well as a capability for retrofitting during service life. This generation of turbine stages 3 and 4 blades and vanes has a new, optimized aerodynamic airfoil designed with enhanced material, coatings, an improved cooling air path and a reduction of parasitic losses.

Customer benefits

Siemens innovative 3D optimized turbine blades and vanes for stages 3 and 4 can include the following benefits:

- Increased gas turbine power up to 2.5 MW^{*)}
- Increased gas turbine efficiency up to 0.5 percentage point^{*)}
- Reduced life cycle costs
- Compatible with the Siemens 41,000 equivalent operating hours (EOH) maintenance concept upgrade



Siemens innovative 3D optimized turbine blades

These Siemens innovative 3D optimized turbine blades and vanes are applicable for stages 3 and 4 of the SGT5-2000E (V94.2) frame.

For the SGT5-2000E (V94.2) and SGT6-2000E (V84.2) frames the Siemens innovative 3D optimized turbine blades and vanes are also available for the stages 1 and 2.

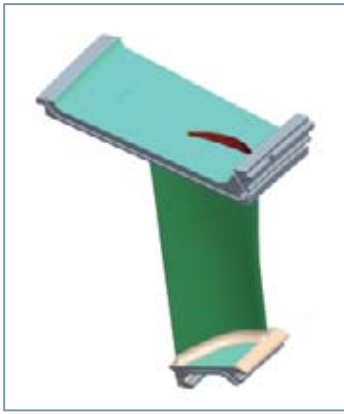
Scope of supply

The Siemens innovative 3D optimized blades and vanes for the turbine stages 3 and 4 are just one of the many innovative modernization packages available.

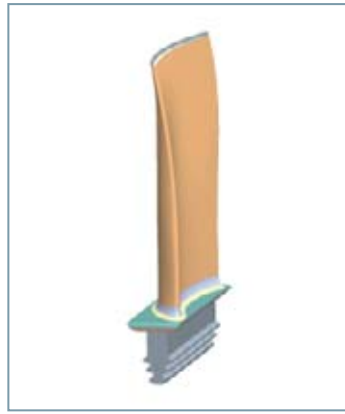
Performance enhancement programs – gas turbine

Answers for energy.

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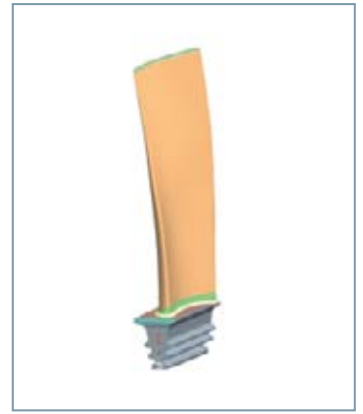
3D-CAD model of Siemens innovative 3D optimized turbine vane 3



3D-CAD model of Siemens innovative 3D optimized turbine blade stage 3



3D-CAD model of Siemens innovative 3D optimized turbine vane 4



3D-CAD model of Siemens innovative 3D optimized turbine blade stage 4

The scope of this modernization includes the following highly efficient profiles and additional turbine parts:

- Turbine vane 3 (including ruffle seals and U-shaped seal ring segments)
- Turbine blade 3
- Turbine vane 4 (including ruffle seals)
- Turbine blade 4

The Siemens innovative 3D optimized turbine blades and vanes can potentially be implemented in a stage-by-stage replacement. According to Siemens'

recommended maintenance schedule a major outage for the installation of this modernization is estimated. We offer a full range of field service capabilities to help you manage your maintenance and outage schedules.

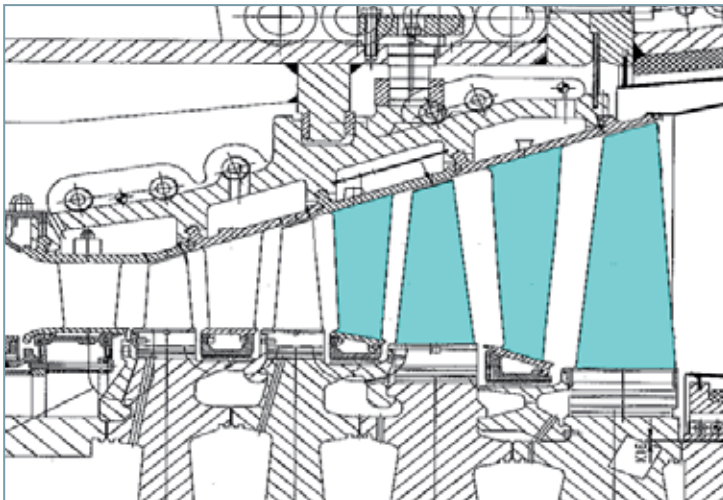
References

Siemens has successfully implemented Siemens innovative 3D optimized blades and vanes for turbine stages 1 to 4 in a SGT5-2000E (V94.2) gas turbine in Australia in 2008.

More than 30 units are in operation worldwide with the Siemens innovative 3D optimized blades and vanes for the turbine stages 1 and 2.**)

18 units of frame type SGT5-2000E (V94.2) have been retrofitted worldwide with turbine stages 1 and 2.**) Examples include:

- Two units in Argentina
- One unit in Australia
- Five units in Belgium
- One unit in the Netherlands.



Schematic illustration of Siemens innovative 3D optimized blades and vanes on turbine stages 3 and 4

For more information please contact your local Siemens sales representative.

*) actual results may vary
**) as of August 2010