TOP 100 Top-Innovator

Lattice supported blade DBP for GUD-Powerstation Diverter damper

For their GUD Powerstation at Antwerp, Degussa AG has commissioned RAUMAG-JANICH to supply all necessary flue gas dampers.
Included was a diverter damper NW 2400 x 6400 mm with internal casing insulation. It directs the exhaust gas from a General Electric type LM 6000 gasturbine either to a 120 MW heat recovery boiler, or to the waste gas stack.

This diverter is the first of its type which has been equipped with the newly developed lattice supported damper blade DBP.

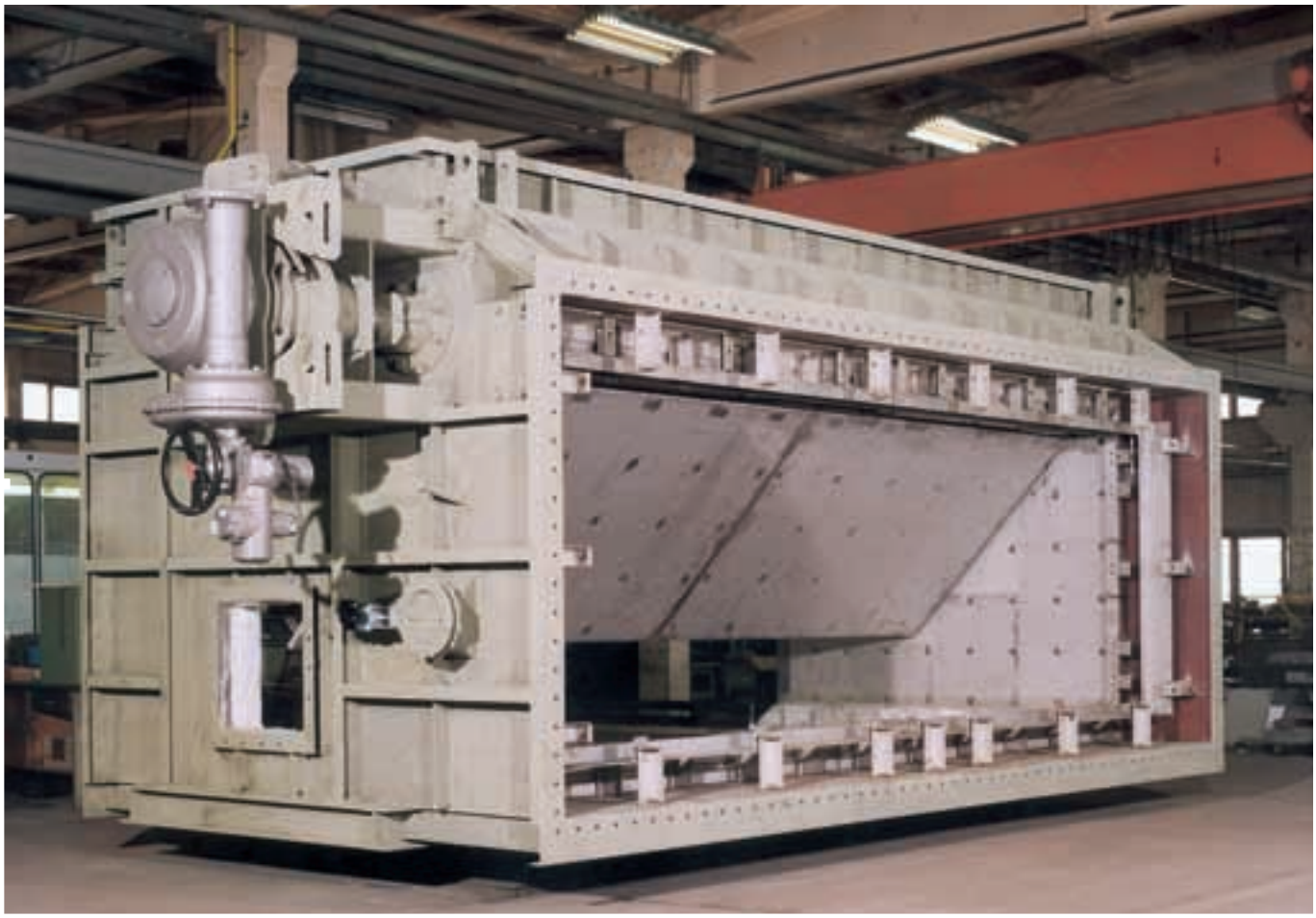
Diverter damper NW 2400 x 6400 mm during final assembly and testing in the works of RAUMAG-JANICH.

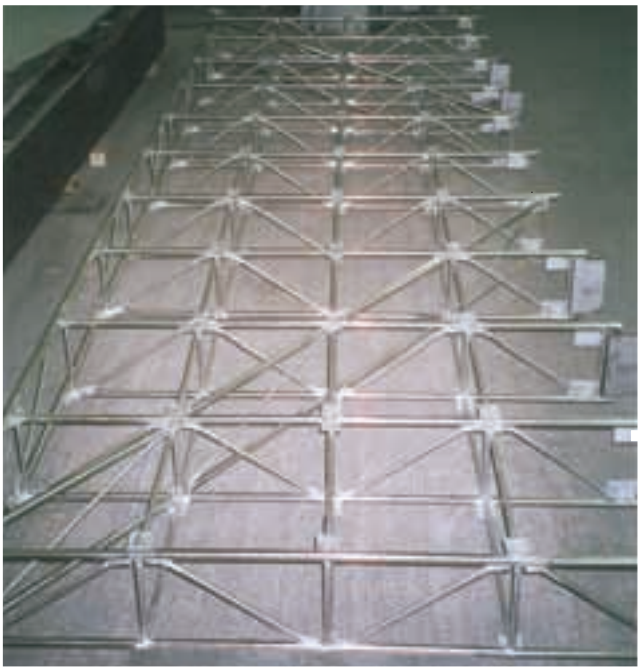
Following the successful introduction of this design concept by RAUMAG-JANICH in connection with a very large shut off damper for a DeNOX plant it was decided to design the blade of the GUD-diverter along the same principles. The result has been absolutely convincing.

Contrary to conventional blade designs, the lattice supported blade remains free of distortion when subjected to the usual, very rapid temperature rise. This is due to the uniform geometrical shape of the members of the lattice frame work, as well as the unrestricted gas flow through the structure, which ensures a perfectly even heating up of all its components.

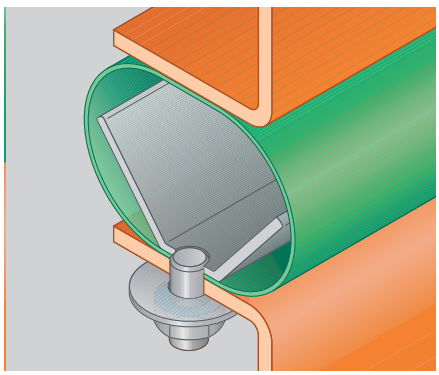
The blade shrouds are able to expand independently from the lattice frame members.Their cardanical method of attachement permits differential expansion without causing distortions. A further advantage of the design is the comparatively low weight of the blade.The power required to accelerate it is therefore, specifically in cases of short operating times,very much lower.

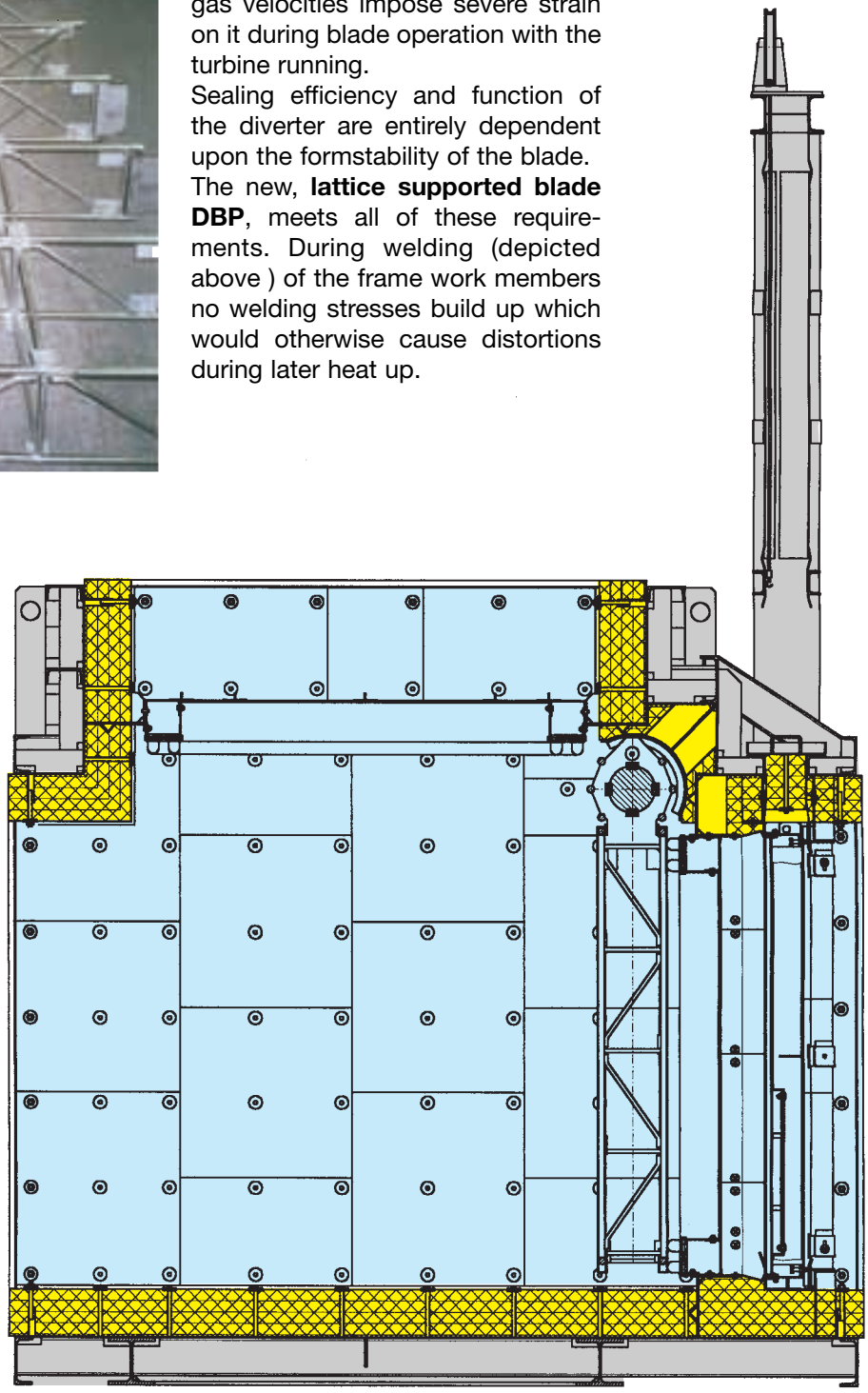
The design calculations of the lattice supported blade have been based on the "finite element" method. In view of its clear geometrical proportions and flow conditions within the blade structure, the properties and behaviour of the blade in service are entirely predictable.





The pivoting blade is the core part of a diverter damper behind a Gas-turbine plant. Specifically during turbine start up it is exposed to high thermal loads.High turbulences and gas velocities impose severe strain on it during blade operation with the turbine running.
Sealing efficiency and function of the diverter are entirely dependent upon the formstability of the blade.
The new, **lattice supported blade DBP**, meets all of these requirements. During welding (depicted above) of the frame work members no welding stresses build up which would otherwise cause distortions during later heat up.





The drawing depicts a cross section through the diverter.At its outlet it is equipped with a blanking plate, which is positioned outside the duct during normal operation. The pivoting blade carries a double seal on each side with which it makes contact with the respective landing bars in the end positions. With seal air, 100% tightness is achieved.
Because of its high flexibility (30 mm) and stability at high gas velocities the recently introduced sealing system DBPa NICROFLEX-HIPERFORM is preferably used. (depicted above, see also RAUMAG-JANICH Technology No. 4)

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