

# A BESPOKE VENTILATION AND AIR CONDITIONING STRATEGY FOR THE GRAND HALL AT ZOLLVEREIN COAL MINE.

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The coking plant at the Zollverein World Heritage Site is 650 metres long. When the mine was still in operation, a total of 304 coke ovens converted more than 10,000 tonnes of coal per day into 8,000 tonnes of coke. They produced 3,000,000 m<sup>3</sup> of gas. While the coking plant produced coke, gas exhausters and compressors were used to clean every day up to 4,000,000 m<sup>3</sup> of coke oven gas from tar, ammonia, hydrogen sulphide and benzene. The gas was then used for under-firing the coke ovens or fed into the mains gas network.

Thanks to a private investor, the huge gas exhauster and compressor hall is now coming to life again as the 'Grand Hall at Zollverein', an extra class event venue. The hall can seat 2400 people and provides full service for all types of events. It has come a long way. Gutting and restoration required utmost care as the industrial monument was meant to retain its authentic character. Gas exhausters and compressors were not removed, but put behind glass windows, where they continue to bear witness to the former use and history of the building.

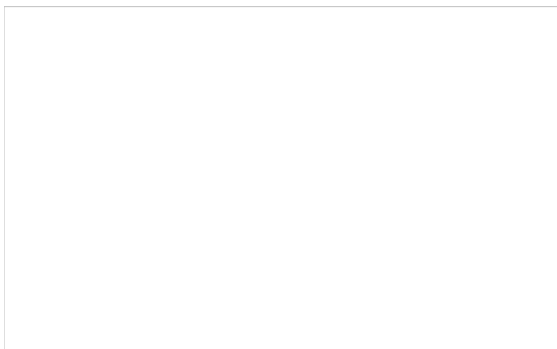
## **A listed monument as a monumental challenge.**

The exhauster and compressor hall is a listed building. As a consequence, the building envelope had to be left unchanged. Developing a sophisticated ventilation and air conditioning strategy that would meet the high demands on safety, comfort, heritage protection and acoustics was a major challenge. Insulated extract air ducts and calcium silicate smoke control dampers of Type EK-EU, which due to their special construction also have good acoustic properties, make sure that any noise remains inside the building.

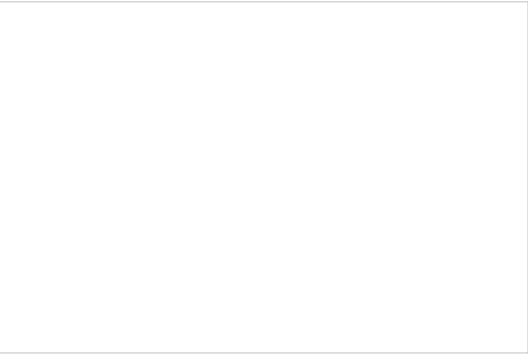
## **Ventilation and smoke extract – a science in itself.**

German law requires that internal spaces with an area exceeding 1000 m<sup>2</sup> have a smoke extract system. Since the building is listed, it was not possible to install smoke exhaust fans on the roof and hence fully visible. What to do? The solution was to install ten X-FANS BVAXN fans, extract air ducts and smoke control dampers in the roof lanterns. Extracting the required 80,000 m<sup>3</sup> of smoke means that the same quantity of fresh air has to be let in: through dedicated additional supply air inlets, the main stairwell and two large multileaf dampers that open if smoke is detected, 30,000 m<sup>3</sup> in total. Another 50,000 m<sup>3</sup> additional supply air are provided by the specially designed air handling unit. In the event of a fire, the air handling unit automatically goes into smoke extract mode and provides the required additional supply air.

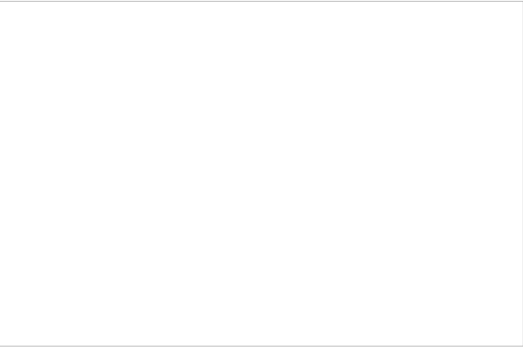
The weatherproof X-CUBE air handling unit with a highly efficient rotary heat exchanger is installed outdoors and can provide 56,000 m<sup>3</sup> of treated fresh air to the first floor event hall and to the ground floor. The air is supplied to the hall with Type TJN jet nozzles that throw the air far, yet as quietly as possible, into the room. Type AF walk-on floor diffusers are also used for supply air discharge.



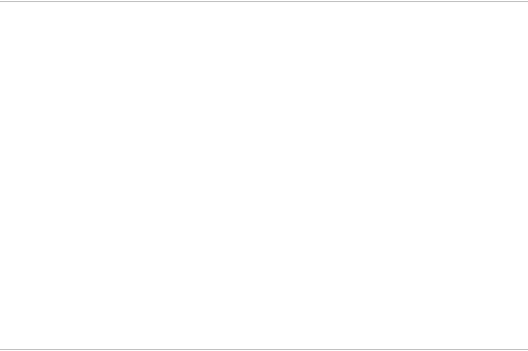
*Grand Hall at the Zollverein Coal Mine: The former gas exhauster and compressor hall has turned into an extra class event venue.*



*A dedicated weatherproof X-CUBE air handling unit provides the hall and the ground floor with up to 56,000 m3 of treated fresh air.*



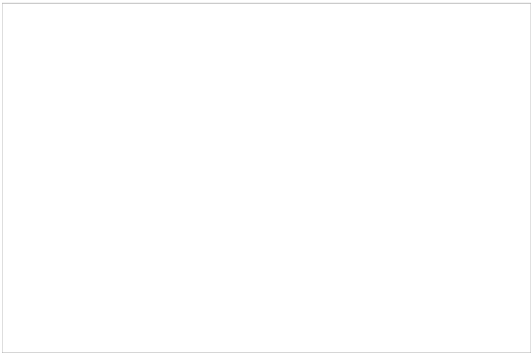
*Previously used machines give visitors a feel of authenticity and add to the special charm of the heritage hall.*



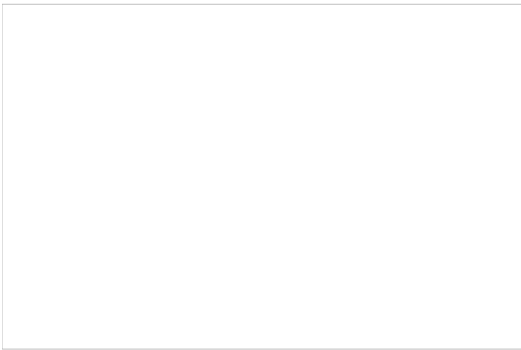
*Adjustable jet nozzles are ideal for supplying air to this very large hall.*



*Ten BVAXO smoke exhaust fans remove the smoke in the event of a fire.*



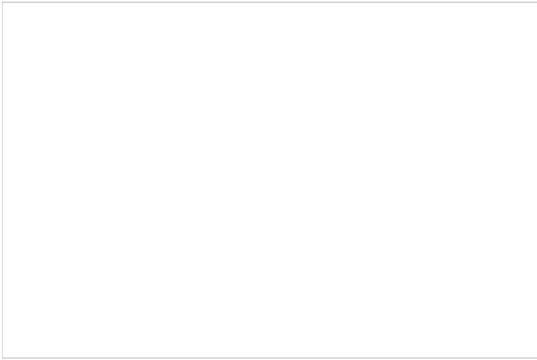
*In the event of a fire, air is supplied by means of noise-insulated multileaf dampers, special supply air inlets and the main stairwell. An air handling unit also supplies a considerable part of the additional supply air.*



*Ducts and swirl diffusers are installed exposed to add to the industrial style of the ground floor lounge and bar area.*



*A small X-CUBE air handling unit in the basement removes the extract air from the catering area if required.*



*The pre-configured X-CUBE compact is ideal for the restricted space in the basement and totally sufficient for ventilation of this space. It includes X-CUBE control to enable demand-based operation.*

#### [Press release](#)

TROX is leading in the development, manufacture and sale of components, units and systems for the ventilation and air conditioning of rooms. With 27 subsidiary companies in 27 countries on 5 continents, 14 production facilities, and importers and representatives, TROX is present in over 70 countries. Founded in 1951, global market leader TROX, whose international head office is in Germany, generated in 2016 with a total of 3,770 employees around the globe revenues of approximately € 500 million.

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