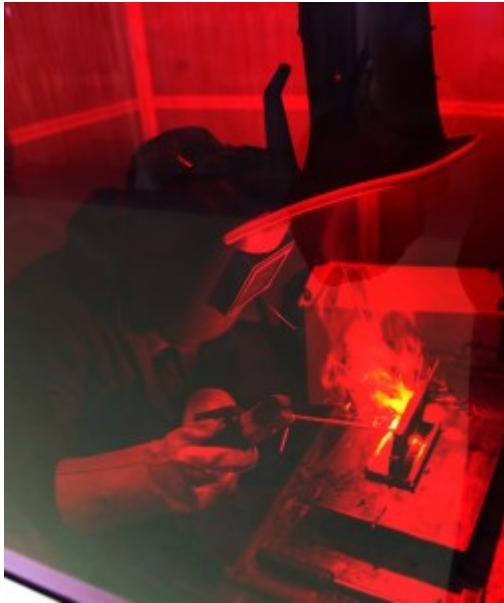


EFFICIENT AIR POLLUTION CONTROL: WELDING WORKS IN THE NEW TEUTLOFF TRAINING WORKSHOP IN CALBE

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Whether for numerous work stations in welding companies or in huge training workshops for welders: precise planning of the extraction and filtering technologies helps to design a hall in accordance with the needs of welders and to achieve high cost and energy efficiency. In 2014 the TEUTLOFF-Schulung und Schweißtechnische Bildung gGmbH has opened a hall reconstructed for the purpose of welders' training.



It is above all thanks to the air pollution control technology that the welders' training workshop in the industrial park Calbe near Schönebeck in Sachsen-Anhalt is still one of the most modern DVS training centres in the whole region. Even the welding cabins comply with a standard that is much higher than in usual cases. The equipment for the welders' training was obsolete. The layout of the training centre did not comply with the requirements of modern welding procedures any more. TEUTLOFF has therefore decided to reconstruct the existing hall and has updated former equipment. The company has invested a total of 600,000.00 Euro in this location. Also thanks to high standards of the extraction and filtering technology the training centre was granted the certificate of DVS training company.

The air pollution control system focuses on the central extraction and filtering device. In order to ensure bigger capacities in the hall, the device has been placed outside. Due to its weatherproof construction it is capable of resisting the most extreme weather conditions. Moreover, noise emissions which are very low anyway - the integrated fan is equipped with special acoustic insulation - are kept completely outside the hall. A welding trainer can operate the device directly from the hall thanks to the second control terminal that has been integrated inside the hall.

Special membrane filter separates ultrafine dust particles from the air

With up to 54,000 m³ air volume per hour the extraction and filtering system possesses enormous extraction capacity. It extracts the welding fumes with a pipeline system from a total of 36 work stations - previously only 20 training members could simultaneously perform welding works in the hall. It does not matter, whether the welders are working at one or many work stations: using a frequency converter and pneumatic gate valves that separate all work stations from each other, the device is capable of adjusting the extraction power based on the demand. The vacuum in the pipeline remains constant during the whole process, so that there are no restrictions for welders working at separate work stations. The next advantage of the demand-based adjustment: it allows cost savings due to lower energy consumption costs.

The core of the filter located inside the device is the innovative ePTFE membrane filter. This filter purifies the air in more than 99% from ultrafine particles of less than 0.4 µm - the welding fumes consist of such particles in 98.9%. Even the particles of only 0.1 µm can be separated in about 92%. Thanks to this

technology TEUTLOFF exceeds the legal minimum requirements - according to DIN EN 60335 a filter with dust class M is enough - and thus it fulfils in advance any possible cases of tightening the limits.

Flexible control ensures high acceptance level of the users

There are 25 exhaust arms attached to the device. During the low vacuum source capture these arms capture the welding fumes at the source at 25 work stations. The exhaust arms can be manually rotated by 360 degrees and swivelled. The form of the hood requires 40% less tracking than the usual hoods. The exhaust arms remain unsupported in the required position. Moreover, the exhaust arms ensure a better view of the work piece due to the integrated LED lights that illuminate the work station.



The equipment of welding tables also promises the best training conditions. They are equipped with sheet steel support surface with fireclay bricks for flat welding works and a iron bar grating for deep welding works. Fixed welding equipment is integrated with all the tables. In order to protect the environment around the welding station also from noise emissions, each welding station is integrated with a welding cabin with a special insulating partitioning wall system. Dimmed and sliding vertical blinds protect the entrance area of the welding cabin. Another advantage: all welding cabins are equipped with a dimmed observation window. Thanks to this, welding trainers are not in danger of hurting their eyes while looking at the electric arc.



Besides the welding cabins the modernised training centre also possesses six sanding cabins made of insulating partitioning wall system with sliding, transparent vertical blinds. In each cabin there is one sanding table suitable for industrial use. The side walls are covered with noise reducing material. Bigger particles fall into a dust collection drawer. The remaining sanding dust is captured like the welding fumes at the welding work stations through the central extraction and filtering system – it works the same at the five cutting tables for hand cutting training. A removable scrap box and clamping device for placing the welding torch

are also integrated with each table. The tables can be operated with pedal mechanism and they are also connected with the central extraction system.

Energy saving thanks to heat recovery

The training centre is setting standards not only regarding the questions of occupational safety, but also energy efficiency. Thanks to the air pollution control technology Teutloff is able to save 40% of energy costs in order to heat the hall in winter time. The two-way-system allows an efficient heat recovery. The device can be operated both in air circulation and air extraction mode. Depending on the season of year it brings significant advantages: in the summer the filtered air is removed from the building. Therefore it is not necessary to install any additional air conditioning system. In the winter the system makes it possible to reuse filtered air. The air that is already warmed up remains in the air circulation mode in the hall. Because

the system has been granted the IFA-certification, it is even allowed to process chrome-nickel-steel in the air circulation mode. And this results in lower heating costs during the winter.

