

KEMROC KDS 30 diamond saw in a railway tunnel

CABLE DUCTS REMOVED QUICKLY

Making room for new tunnel lining

The Elleringhauser Tunnel in Germany's Hochsauerland region is being completely renovated. To install new tunnel lining, concrete cable ducts had to be removed from the bottom of the tunnel wall. Specialists from the EET consortium (Max Bögl/Marti DE/Marti CH) chose an 8-tonne compact excavator and a KEMROC KDS diamond saw to cut the concrete ducting into manageable pieces.

The Elleringhausen Tunnel in the Hochsauerland (North Rhine-Westphalia) has a long history. The almost 1,400 m long railway tunnel near Olsberg and Brilon is part of the Upper Ruhr Valley Railway, which runs between Aachen and Kassel. Between 1868 and 1872, the tunnel was built as a single tube with double track. The tunnel, – a classic masonry structure in a horseshoe shape – has to be renovated after almost 150 years of use. Three contracting companies Max Bögl Stiftung & Co. KG, Marti GmbH Deutschland and Marti Tunnel AG joined forces to form the ARGE Elleringhauser Tunnel (EET consortium).

Most of the renovation work will be carried out using the so-called tunnel-within-a-tunnel method, which avoids full closure over longer periods of time. Initially, the existing masonry will be profiled before a new prefabricated tunnel lining will be installed. To create the necessary space for the new tunnel lining, existing concrete cable ducts for signalling and lighting technology located on both sides of the tunnel floor must first be removed.

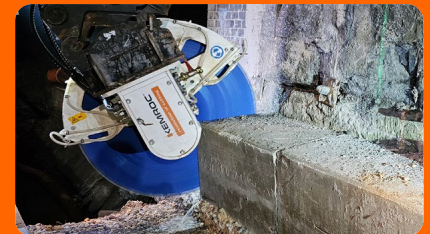
Dipl.-Ing Thomas Töpfer, mechanical engineer from ARGE partner Max Bögl, explained the logic behind their choice of equipment: "Using an excavator with concrete shearer or pulveriser was out of the question due to the lack of space in this tunnel with its narrow clearance profile. In addition, the renovation work takes place only at night, between 10:00 p.m. and 5:00 a.m., with the railway operating. Therefore, the standard method of core drilling and diamond cutter or wire saws would not be practical, because the equipment used would have to be set up and dismantled over and over again." For this reason, those involved in the consortium opted for a solution that is unusual in tunnel construction – namely the use of diamond saw technology in the form of a rented mini excavator with a diamond saw from the KDS range of attachments from the manufacturer KEMROC.



An 8-ton excavator with a KDS 30 diamond saw enters the Elleringhauser Tunnel on a platform truck. The task is to cut concrete cable ducts at the bottom of the tunnel walls.



The operator positions the excavator perpendicular to the axis of the tunnel and positions the KEMROC diamond saw on the cable duct at intervals of 150 cm.



Cutting through the cable duct – with little dust thanks to water spraying. Then the cut section of concrete is lifted loose and loaded for transport.

Fast cuts

KDS diamond saws from KEMROC are designed for cutting a wide variety of materials including natural stone, granite, reinforced concrete, concrete, asphalt, plastics, wood, foils and aluminium. Mounted on crawler or wheeled excavators and connected to their hydraulic circuit, the attachments deliver high performance in many industrial sectors with very low stress to the carrier, operator or the environment. High rotation speeds and a selection of diamond saw blades make these attachments very effective in a wide range of applications.

At the Elleringhauser Tunnel renovation project, the 8 t compact excavator with a KEMROC KDS 30 diamond saw (80 kW nominal power) combination proved to be very practical: On the one hand, the compact excavator was small enough to move safely in the tunnel cross-section. On the other hand, the diamond saw has a sufficiently large diameter saw blades to cut through the concrete ducting (height x depth = 60 x 40 cm) completely.

The cutting process in detail: mini excavator is taken into the tunnel on a platform truck. At 150 cm intervals, the diamond saw is set up in front of the cable ducting at the bottom of the tunnel wall. Then the operator cuts through the concrete duct from top to bottom, switches to a hydraulic hammer and lifts off the portion of concrete with three or four blows. He then switches to a grab and loads the concrete section for removal from the tunnel.

The cutting work lasted from January 8 to 27, 2024 – significantly quicker than initially planned. For Thomas Töpfer, the results confirmed that the choice of equipment was correct: “We are familiar with milling attachments and have experience using KEMROC’s range of equipment in previous projects, for example in tunnel and asphalt road construction. It’s good to know that the manufacturer’s range also includes attachments not originally intended for tunnelling applications, but they can be just the right solution in certain cases like this.” ■

Publisher

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The cut-out sections of concrete cable duct are transported out of the tunnel and ready for recycling.



Video from the construction site:
<https://projector.kemroc.net/web/?id=WvzSIza5Cm6QiqsxuY96>