

KEMROC EKT 100 rotary drum cutter

A TASK REQUIRING PRECISION

Supporting buildings and excavating trenches

To underpin a building in Paderborn, the construction company Karl Immig used a 25-tonne crawler excavator with a KEMROC EKT 100 rotary drum cutter. This was used to excavate rock from underneath a building with precision and with little vibration to create space for the necessary foundations. Thereafter the excavator-milling combination excavated trenches for services – and thanks to a 3D excavator grade control system, it was extremely fast and accurate.

The German construction company Karl Immig GmbH from Paderborn is active throughout the East Westphalia region. The company specialises in earthworks, road construction, civil engineering and trenching as well as commercial and industrial construction. The Managing Director Dipl.-Ing. Felix Schäfers strives to keep his pool of equipment up to date with the latest technology so they can complete contracts as economically as possible.

This was demonstrated on a project at the Paderborn Technology Park in the summer of 2023. In the buildings containing offices and laboratories, a mix of established and new technology companies have been accommodated, most of them being spin-offs from graduates of the neighbouring University of Paderborn. In the neighbourhood of one of these buildings, Immig was awarded the contract to carry out the complete ground works for a new office building, including connecting the site to existing utilities and services. However, the building site is directly adjacent to the existing building. In consultation with local structural engineers, it was therefore decided that the existing building had to be underpinned with concrete along the side facing the new job site to prevent possible settlement damage caused by the extraction of approx. 4,500 m³ of material that was required.

Concrete reinforcement

Ground conditions under the topsoil consisted of a marly formation of (previous) soil classes 6 – 7. This hard, layered rock was difficult to loosen using the excavator bucket, and excavating the material from under the façade with a hydraulic hammer was not even considered because of the unavoidable, harmful vibrations to the building and



A 25-tonne crawler excavator and an EKT 100 drum cutter attachment from KEMROC during the excavation of a building in the Paderborn Technology Park.



Without any vibrations to the building or its contents, rock below the façade is carefully and precisely milled out.

the sensitive technical equipment inside. Instead, the specialists at Immig decided to rent a KEMROC EKT 100 rotary drum cutter attachment (100 kW nominal output) for use on their 25-tonne crawler excavator. In terms of specifications and performance values, this was the most suitable model to excavate the right sized recesses under the building to take steel reinforcement filled with poured concrete.

The step-by-step method involved: The operator places the excavator in front of the exposed façade and mills a recess about 30 cm deep into the rock beneath the building. This is repeated at intervals of about 100 cm along the 15 m long façade. Steel reinforcement is placed in the excavated recesses which is then filled with poured concrete. After hardening, the strips between the reinforced sections are processed in the same way.

Afterwards, according to Felix Schäfers, the entire process proved to be more efficient and cost-effective than originally expected. “Compared to using an excavator with a ripper or hammer, we saved a lot of working time and almost completely avoided any vibration in the building area”, commented the Managing Director. “In addition, excavating the rock to such a level of accuracy made it easier to install the formwork and fill with concrete.”

Excavating with precision

The KEMROC drum cutter attachment was used for another part of the project, too. It worked with great effectiveness in the excavation of trenches for the new building. The excavator used on this construction site was equipped with a 3D excavator grade control system, as are all hydraulic excavators operated by the Immig construction company. It can be programmed with electronic planning data of the construction project, allowing the operator to create declines or embankments with an accuracy of a few centimetres with the excavator bucket. This works just as well with a KEMROC drum cutter attachment as it does with a bucket. Once the system is calibrated, the drum cutter attachment can be guided with centimetre precision.

This is exactly what the machine operator used when excavating trenches, which were around 80 m long, for drainage pipes. According to Felix Schäfers, working with this system had two major advantages: “Firstly, by using the excavator control system, we avoid a lot of work for surveying and staking out, we can start excavating exactly and accurately right from the start. Secondly, the drum cutter attachment is much more accurate than conventional rock buckets.” This reduces costs related to oversizing and backfilling. In addition, milling produces a fine, homogeneous broken material that can be used immediately for backfill on this or on another construction site. This eliminates the need to use a crusher or to transport material.”



At set intervals, recesses are excavated, fitted with reinforcing formwork and then filled with concrete.

The fact that the operator was not only able to program the drum cutter dimensions into the excavator control system, but he also understood how to use it, became apparent towards the end of the project by the consumption of cutter picks: The package of replacement picks provided by KEMROC for the rental attachment was returned to the manufacturer unopened. ■



Video from the construction site:
[https://projector.kemroc.net/
web/?id=DNTkvYK8uck6IDf3GhuR](https://projector.kemroc.net/web/?id=DNTkvYK8uck6IDf3GhuR)

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