



When every other method fails, thermal imaging can still spot the problem.

Cable repair company Becker & Hüser GmbH uses a FLIR E40bx camera to quickly spot faults in cables.

Heavy industries like mining, shipbuilding or crane works, rely on heavy, rugged, industrial cables to ensure continuous power or communication performance. Whenever such a cable brakes down, there usually is a big problem in terms of productivity, downtime and money lost. That's where Becker & Hüser GmbH comes in. This German cable repair specialist helps its customers to be back in business in the shortest amount of time. To offer their customers the quickest cable repair service possible, Becker & Hüser GmbH makes use of thermal imaging cameras from FLIR Systems to exactly locate where the problem is.

Based in Sonsbeck, in the German state of North Rhine-Westphalia, Becker & Hüser GmbH (www.kabelreparatur.eu) has been known for more than 30 years for its high-quality cable repair services at competitive prices. Becker & Hüser has an experienced team of cable specialists for repairs either at the site of the customer or at the company plant. The service team is available 24/7 and will repair all types of copper cables, with or without fire optics, in a wide range of industries, including brown coal open cast mining, ship building, the crane industry, railway systems and ports, gravel dredging facilities and conveyor systems.

Time gains

Mr. Andreas Becker, managing director at Becker & Hüser GmbH, explains the rationale behind its company's activities: "The cables that our industrial customers are relying on are often used in harsh conditions. Think of the mining industry for example. Cables also move around a lot, so it is no wonder that they are damaged and break down from time to time. We are there to help companies with fast repair services, so they can reduce their downtime as much as possible."

Companies do not always have cables



A surge voltage generator is used for locating and pin-pointing high and low resistance faults in power cables



Surges cause noise at the fault position which can be detected either on sight, by feeling the cable with a rubber glove or even by hearing



on stock. So when a cable gets damaged, they will need to choose between repair and purchasing a new cable. The former option usually provides the highest time gains. "Waiting for a new cable sometimes requires months. We can repair a cable in matter of weeks or days, sometimes even hours," says Andreas Becker. "This can really make a difference, for example in the case of cable damage on a ship that needs to leave the harbor." In addition, Becker & Hüser GmbH manages to return the cable to the customer as good as new, with the same properties, in terms of diameter, flexibility and tensile strength.

Traditional detection methods

Cable repair includes a lot of inevitable manual labor. Connecting the enormous tangle of fibers which eventually constitute the whole cable is a meticulous and time-consuming job for specialists. But also for fault detection, there is no magic trick to quickly locate a fault inside a cable. Becker & Hüser GmbH uses a surge voltage generator for locating and pin-pointing high and low resistance faults in power cables. The stored energy of the high voltage capacitors is fed at intervals in to the faulty cable. This causes noise at the fault position which can be detected either on sight (a high voltage surge can generate sparks), by feeling the cable with a rubber glove or even by hearing.

Thermal imaging for fault detection

Andreas Becker first learned about the possibilities of thermal imaging at a German tradeshow. "We saw how quick and accurate thermal cameras can see voltage differences as heat differences. After that show, we got in touch with FLIR Systems, who proposed the FLIR E40bx camera as a very cost-effective solution for fault detection." Becker & Hüser GmbH is now using the E40bx with a 50° lens and MSX® functionality.



Andreas Becker: "When all our traditional methods of fault detection fail, we know that we can still use our thermal imaging camera to exactly find out where the problem is."



Becker & Hüser employees following a thermal imaging training



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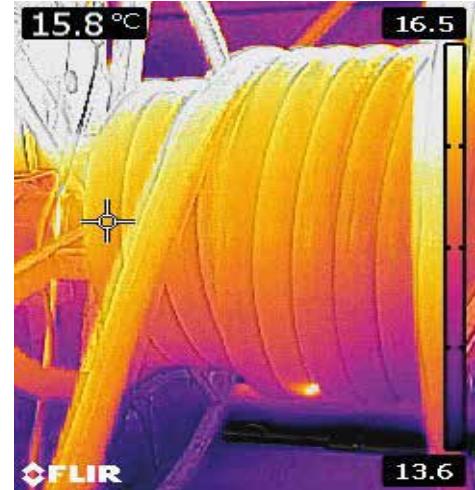
"When all our traditional methods of fault detection fail, we know that we can still use our thermal imaging camera to exactly find out where the problem is," explains Andreas Becker. "For example when the fault is located at the end of the cable, right at the connection, then it will be difficult to locate the fault with our traditional methods. Our thermal imaging camera however can see the heat difference without any problem. What's more, detection with a thermal imaging camera will lead to an accurate result much faster."

Cables are wound onto large reels. To inspect an entire cable, Becker & Hüser employees unwind the cable from one reel to another. While the cable is unwinding, they can inspect the entire length for faults by means of the thermal imaging camera.

Seeing is believing. This saying is not only valid for Becker & Hüser GmbH, but also for its customers: "It is an enormous advantage when you can show your customers exactly where the problem is. The FLIR thermal imaging camera allows you to do that. It is a matter of instilling confidence and showing your customer that you are on top of the problem."

FLIR E40bx point-and-shoot camera

The FLIR E40bx is a compact point-and-shoot thermal imaging camera that combines the best performance and value in compact thermal imaging cameras. The camera is easy to use out of the box and offers a temperature range of -20 to 120°C (-4 to 248°F) with an accuracy of $\pm 2\%$ and a thermal sensitivity of $< 0.045^\circ\text{C}$. The 160 x 120 pixel resolution provides high thermal image quality and a 3 megapixel digital camera provides fixed picture-in-picture allowing the overlay of thermal and visible images for easy location identification and clearer documentation. A laser pointer aids aiming while a bright LED lamp provides light in dark corners. The FLIR E40bx can



Hot spots in the thermal images clearly show where the fault is located.

For more information about thermal imaging cameras or about this application, please contact:

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