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FROM ORE TO STEEL

SMART SOLUTIONS FOR THE STEEL INDUSTRY

THE HOT ROLLING MILL

STEEL

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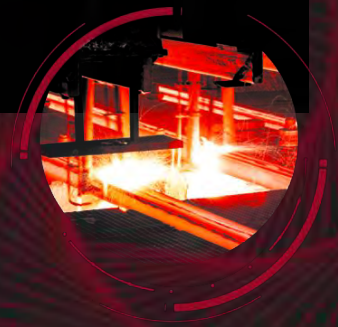
THE HOT ROLLING MILL

The hot rolling mill produces long or wide flat products. For this purpose, the steel is first heated in a walking beam, pusher-type or rotary hearth furnace to temperatures of up to 1,260 °C and freed from scale. The product is then transported by a roller conveyor through a rolling mill, where it is formed into steel sheets, rails or wire, for example. In flat steel processing, the sheet is then wound up in coilers and transported to a cold rolling mill for further processing.



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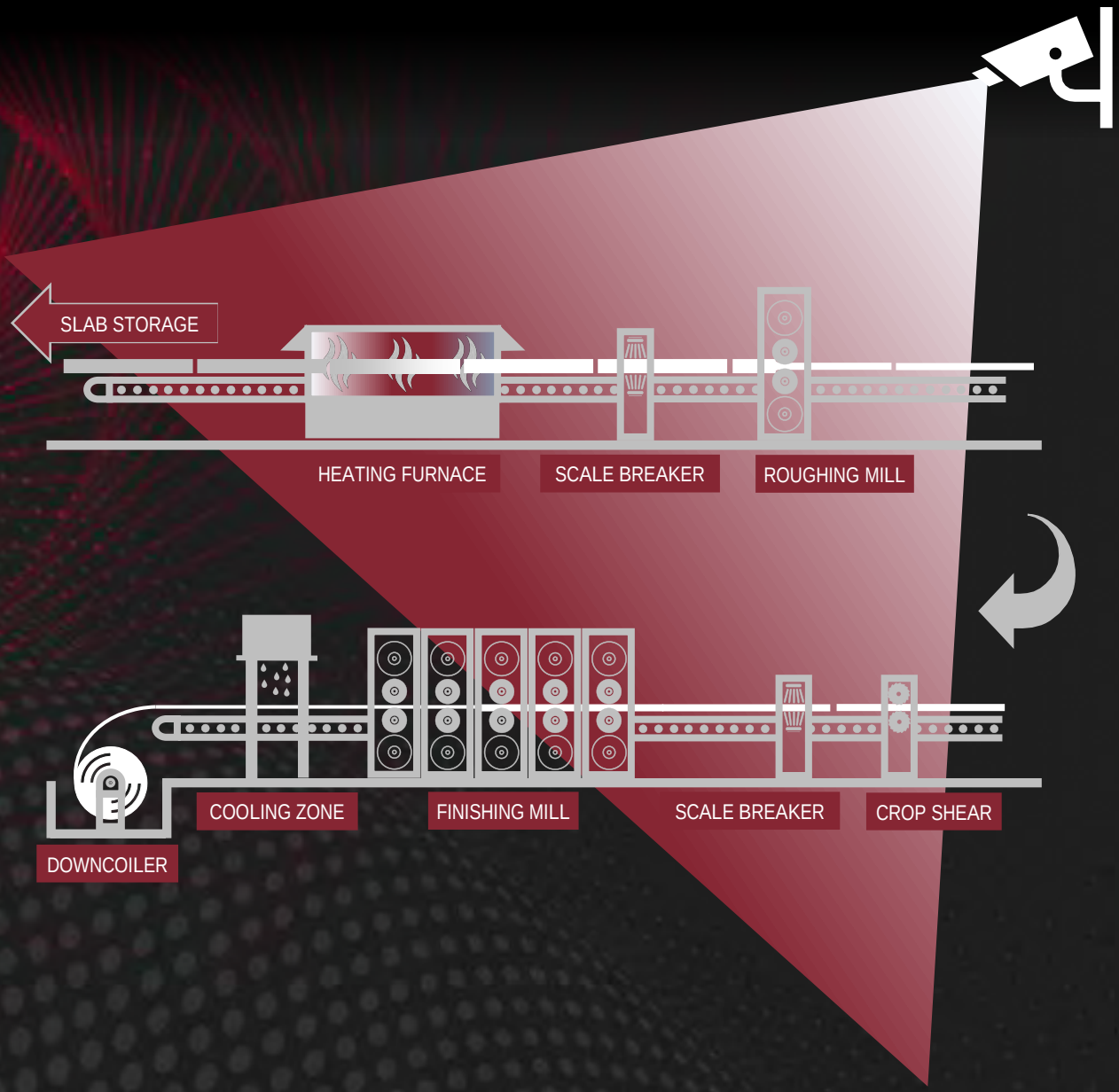
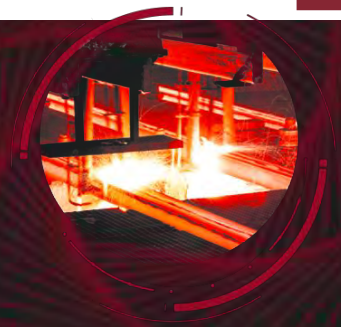


OVERVIEW CAMERAS

In process monitoring, which is geared towards detailed inspection and evaluation within a production chain, visual observation of the entire plant shouldn't be neglected. For this purpose, overview cameras are installed at strategic positions that they provide an overall picture of the current production. The images thus generated are transmitted live to the control center, so that any imminent malfunctions are detected at an early stage.

In addition to avoiding cost-intensive production downtimes, the environment also benefits here: a defective filter system can be detected more quickly, for example, as a change in the color of the exhaust gas often indicates a malfunction. The control center can thus take immediate action and counteract dangers.

At the same time, the use of surveillance cameras increases work safety for the specialist personnel directly working at the plants: The early detection of a malfunction, which the employee on site may not even be aware of, reduces the risk of an accident to a minimum.



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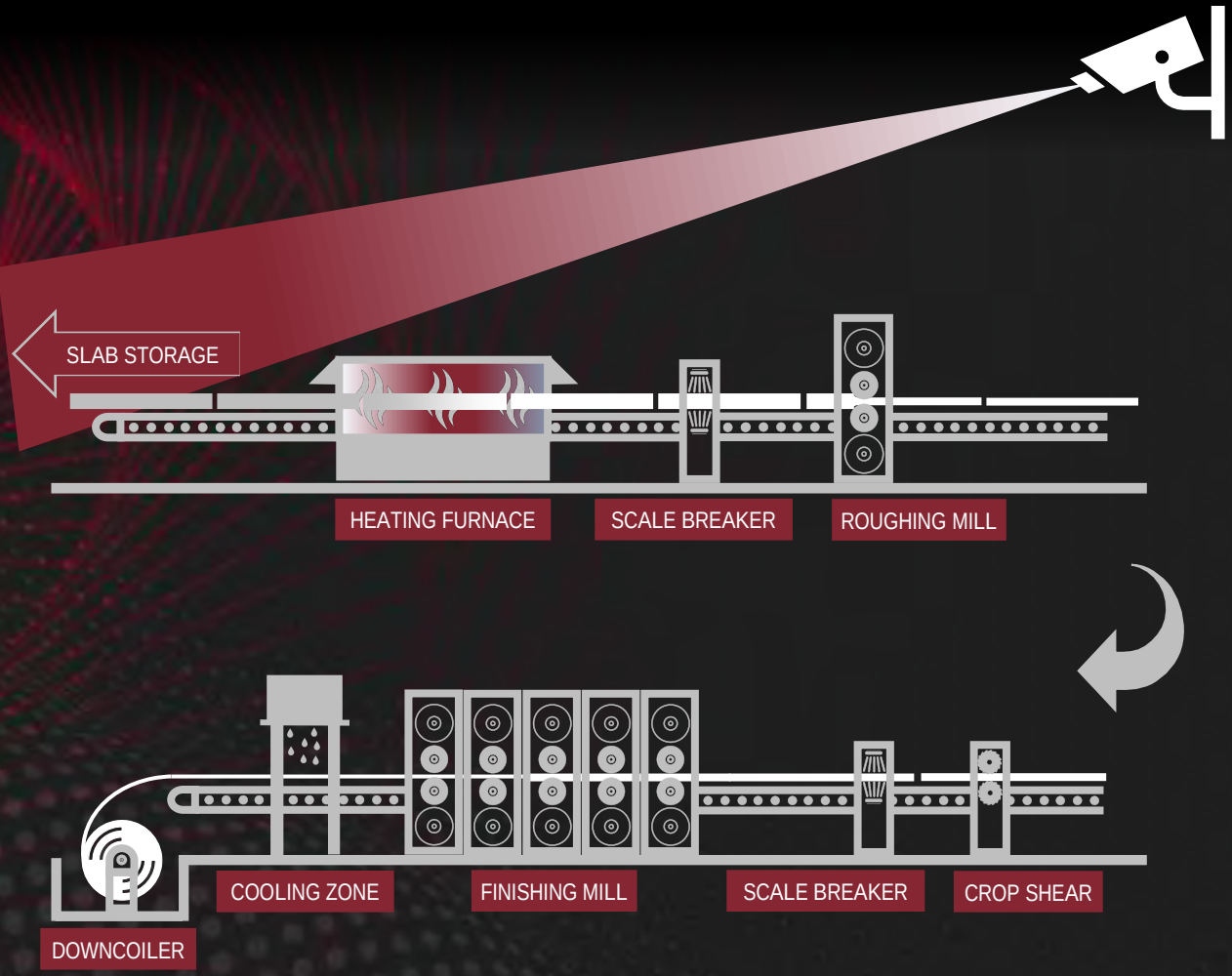
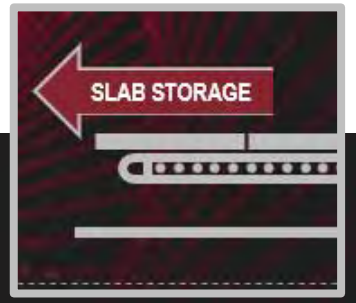
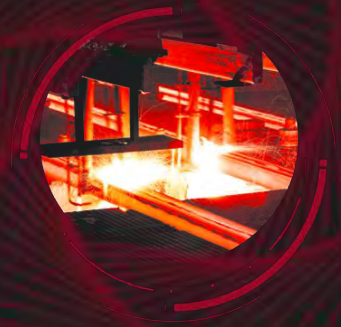


SLAB STORAGE / BAR CODE RECORDING

For a general overview and control, the slab stock is often monitored by means of visual cameras. Furthermore, a general surveillance of the warehouse also serves to increase work safety. Potential hazards that may be difficult for individual employees to detect on site are recognized quicker by the control center, which has a better overall view; accidents can be avoided.

In addition, in some cases the products are provided with barcodes instead of punch marks, which provide indication regarding further processing, length, alloy etc. of the slab. The barcodes are scanned and stored before being loaded into the walking beam or pusher-type furnace. Depending on the requirements, this also serves as a part of a complete documentation of the entire production process.





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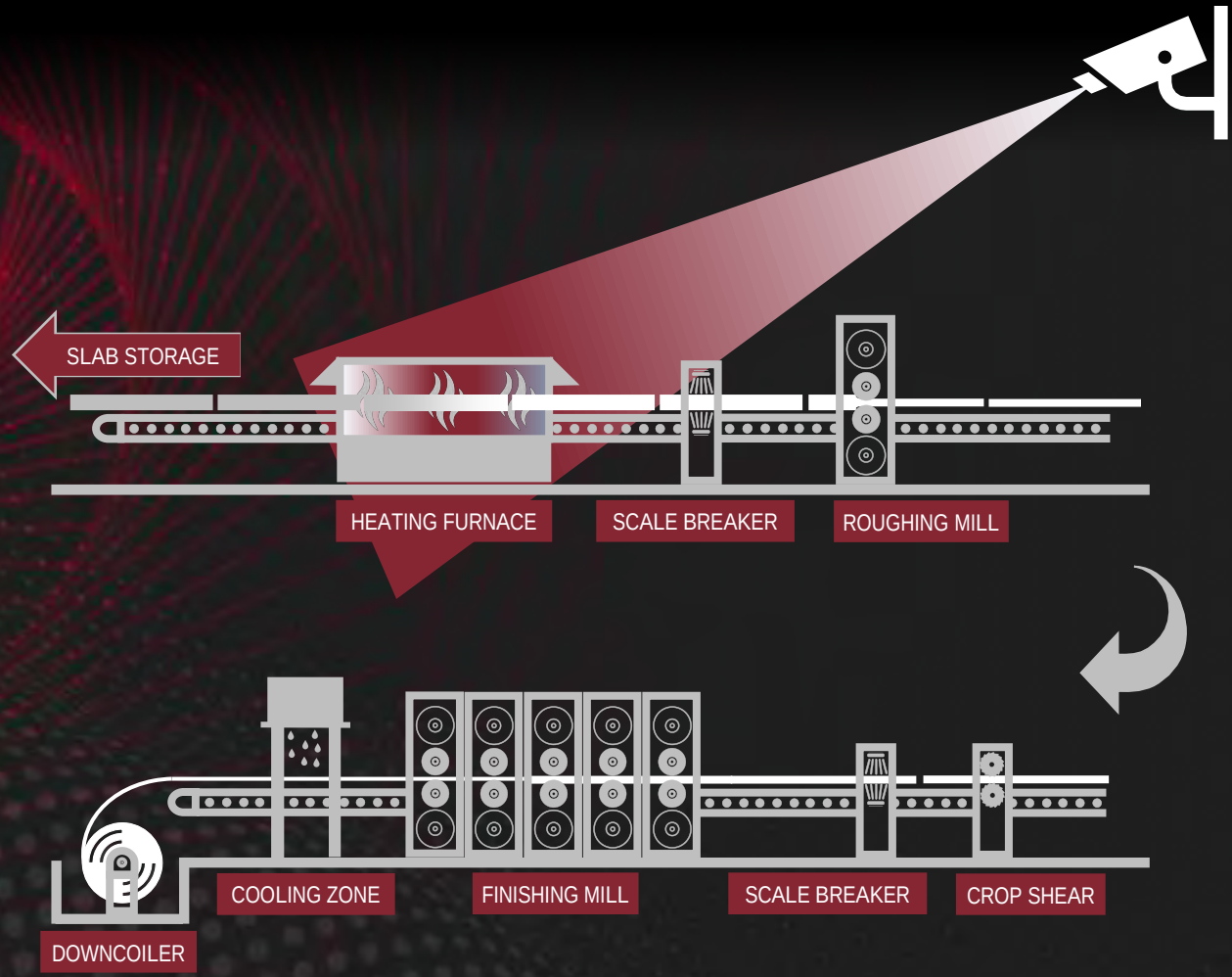
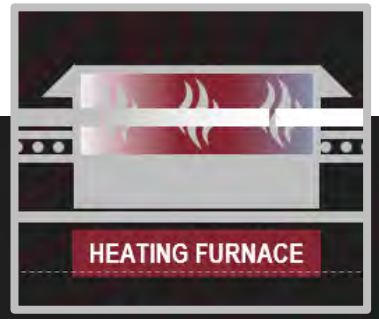
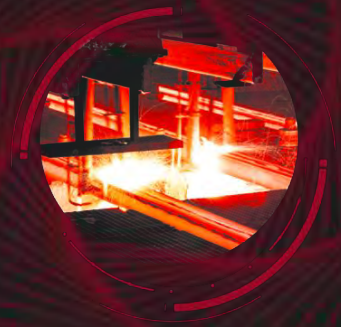


HEATING FURNACE

In a walking beam or pusher-type furnace the slabs are moved continuously: from the charging device the steel is fed to the furnace by a charging system. In a walking beam furnace this is done by individual, parallel arranged beams lifting the slab by an upward movement and transport it horizontally a certain distance, in order to then put the slab back on the furnace bottom. This is repeated in a kind of “furnace route” up to the removal device.

To avoid the slabs getting wedged during their transport in the oven, furnace probes monitor the inside. This way, the operator can precisely control where the steel is placed again or when a new slab can be fed into the furnace.





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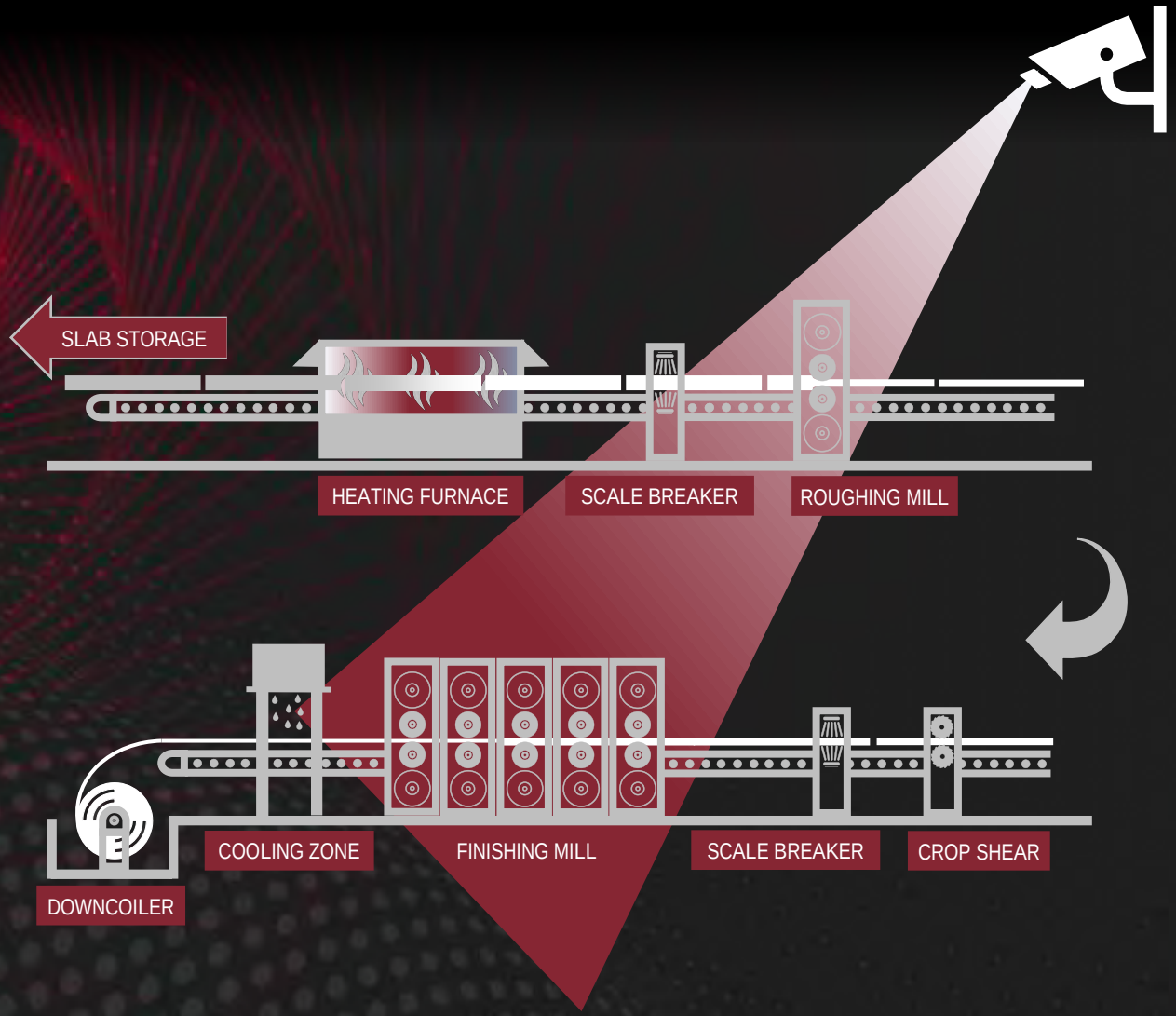
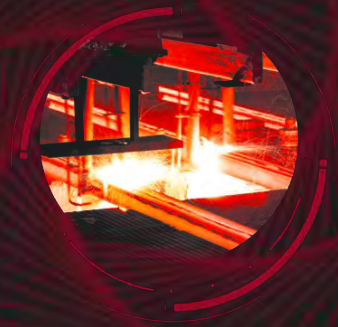


FINISHING MILL

After heating the steel, it is transported through several rolls and thus reduced to a desired thickness. Between the individual rolling processes, the surface of the hot strip can be monitored by visual cameras to obtain information on the surface quality.

Probably the most important camera position is at the point where the hot strip has passed the last roll, before it is wound up into a coil. If defects are detected during the visual material testing, it's possible that the strip is returned to the steel production or – in case of minor defects – its quality is devaluated and it is classified as construction steel, for example.



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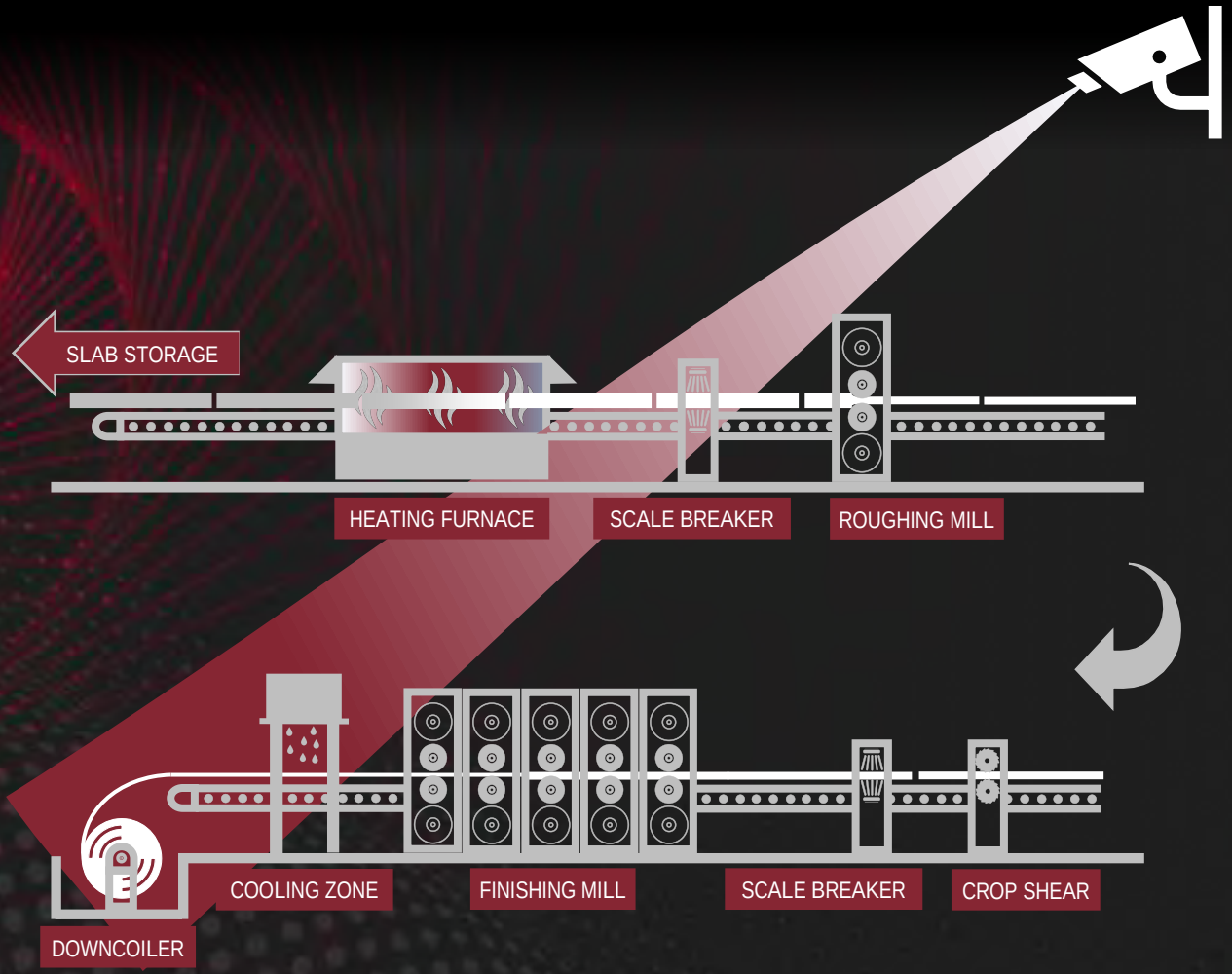
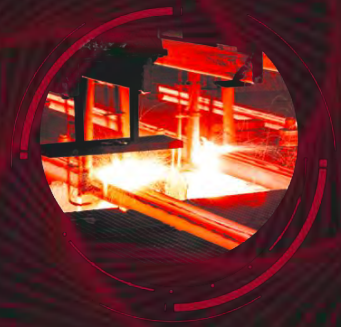


COILER

After the last rolling pass, the hot strip is routed through a cooling bed and the wound into a coil. The coils are then bound and marked according to their intended use.

This process can also be optimally monitored and documented by accompanying visual cameras.



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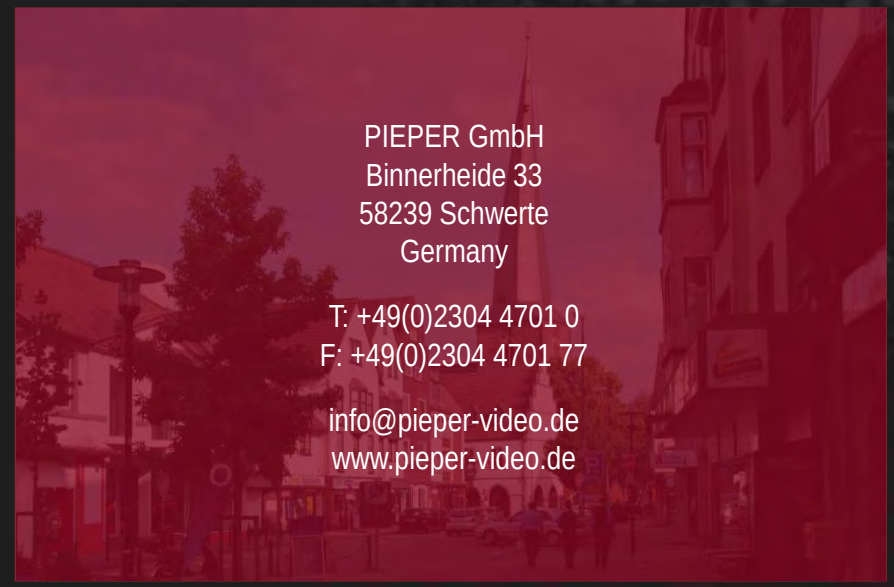

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