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## HEAVY DUTY IN DESERT DUST

In the quarries of the Arabian caliphate Raps Al Chaim, temperatures are extreme and it only rains on 14.3 days a year. Any safety switchgear used here must be robust by design.



Quarry & Mining LLC, based in the Arab Emirate Raps Al Chaim, pursues an unusual business concept. Moritz Keller, Acting Partner of the company, explains: "We are responsible for the project management and construction of systems for the extraction and handling of bulk solids, for example crusher units and conveyor systems, as well as barge and ship loaders. Our market encompasses the Arab states, and we deliver exclusively high-quality equipment with core

components from German manufacturers."

### **Stones not oil**

This strategy has been successful for the company, which was founded in 2001. Quarry & Mining employs around 150 people, uses state-of-the-art engineering tools and has built itself an outstanding reputation, especially in Arabia and the United Arab Emirates.

It is no coincidence that the company is based in the smallest of the seven Arab Emirates. In Raps Al Chaim there are no oil reserves, but some very large quarries chiefly exporting limestone – the basic material for ready-mix concrete – for example to Qatar, Bahrain and Kuwait.



*The ambient conditions pose a challenge to electrical and especially safety-critical components.*

The equipment produced by Quarry & Mining enables material to be extracted, handled and conveyed efficiently. In the process, each individual component is subjected to extreme wear and tear: limestone dust is a permanent feature of the quarries and processing plants. Summer temperatures can reach 50°C every day – in the shade. Despite being close to the coast, humidity is hardly relevant, though: on average in Raps al Chaim it only rains on 14.3 days a year, compared to 121 in Germany.

In spite of the adverse environment, Quarry & Mining uses very complex and high-quality equipment. One example: the kilometer-long conveyor belts which transport the crushed limestone from the quarries in the mountains down to the coast are controlled by drives with variable rpm. Since the belts are driven by the weight of the load, they can feed power

back into the supply network through regenerative braking.

### **3.5 km of conveyor belt technology safeguarded**

German partners and suppliers of components to Quarry & Mining include Amend (conveyor systems), Lemann (crusher units), Nalos (conveyor belts), Steinert (recycling plants), Siebel (drives) – and statue. One current project uses around a hundred heavy-duty switching devices from the statue Extreme range. Christian Draws, Technical Manager at Quarry & Mining, explains: "We installed two conveyor belt systems in an Arabian limestone quarry spanning a total length of 3.5 kilometers – including crushing and screening stations."

The tasks of the engineers also included safeguarding the belt against misalignment and installing an emergency-stop function to take effect along the entire length of the conveyor system.

### **Safety through heavy-duty switchgear**

It was for such applications – also and especially in extreme environments – that statue developed its ZS 91 series. It is available both as an emergency pull wire switch (ZS 91 S) and as a belt alignment switch (ZS 91 SR). Thanks to its broad temperature range of -40 up to +85°C it can be used both in the Arabian Desert and in very cold regions of the world.

The robust housings of the switchgear are able to withstand mechanical wear and tear, and are perfectly sealed both against moisture (IP 66/ IP 67) and – technically even more complex – against fine abrasive

dusts, such as those found in mineral processing.



*The statue Extreme ZS 91 series is available as an emergency pull wire switch (right) and as a belt alignment switch (left).*

Quarry & Mining incorporated around twenty ZS 91 SR belt alignment switches in its conveyor system. Using a roller lever as an actuator, any deviations from the normal tracking of the conveyor belt are reliably monitored. Materials or erroneous loads are thus prevented from falling, which in the worst case could stop the belt.

The safety of the plant is guaranteed by around eighty ZS 91 S emergency pull wire switches, installed all the way down the conveyor belt. They are very efficient, with just one switch required for every 200m (2x100m) of belt. Permanent availability is guaranteed by detection of any breaks in the pull wire system or wire itself. Wire tautens developed by statue enable the wire tautness to be adjusted easily and comfortably, and they also greatly simplify installation of the emergency switches.

The statue Extreme switches have been integrated within the overall plant in such a way as to be well protected. For example, metal covers at the feed points prevent any stones from falling onto the switches. The limestone dust cannot be avoided, however. It – like the very high temperatures – poses an enormous challenge to both the housings and their dealings. The switches rise to these challenges completely, however: whether in Arabian quarries or in countless other complex fields of application, such as conveyor belts for overburden material behind tunnel drilling machines.

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