APPLICATION BRIEF

GET SMART ABOUT GRINDING MILL RELINING

Valley Forge & Bolt, manufacturer of patented bolting products for critical applications, has a family of products that streamline the grinding mill reline process by telling a mine's maintenance staff exactly when they should begin retorquing after new fastener installation.

CHALLENGE

Grinding mills that smash rock and other mining material into smaller, more manageable bits are expected to run non-stop and trouble-free for months at a time. The continuous vibration and force found inside grinding mills are extremely hard on the liner bolts used to fasten mill liners to the mill's shell. When grinding mill liner bolts fall out of appropriate tension, they begin to constantly flex back and forth in the hole. This causes visible stress marks on the bolt caused beachmarks.

The appearance of beachmarks is a sign that the bolt is about to fail. Unfortunately, most of the time these marks aren't spotted until it's already too late. Premature bolt failure, like the kind that begins with beachmarks, brings mills to a halt. And every hour a mill isn't running, a mine is losing hundreds of thousands of dollars.

VALLEY FORGE SOLUTION

Valley Forge & Bolt offers a number of solutions to keep mines operating at peak efficiency.

Valley Forge & Bolt SPC4® load indicating fasteners and Sealing Mill Ridgeback® liner bolts attack the problem of improperly tensioned grinding mill liner bolts on multiple fronts, providing an operational advantage by limiting downtime, increasing efficiency, and saving money.

Valley Forge SPC4® load indicting fasteners measure tension as a percentage of load from within the bolt, information which can read by a variety of external meters. By strategically placing a small number of SPC4® bolts at high-impact areas within a ball mill at relining, they monitor actual clamp load from within the joint. By measuring this loss of tension, a mine's maintenance team can re-torque at an optimal time instead of relying on guesswork.

As little as a dozen of a mill's approximately 600 bolts need to be SPC4® bolts to achieve an accurate measurement. The remainder can be Sealing Mill Ridgeback® liner bolts, which prevent racing caused by leakage of slurry through bolt holes. They eliminate the possibility of point loading at the base of the liner pocket and instead distribute a controlled percentage of load along the entire circumference of the pocket base, preventing self-loosening.

RESULT

Jay Palmer, technical sales engineer for Valley Forge, says mines often have an eye-opening experience when using SPC4® for the first time to gauge retorque time. "As a matter of course, they may wait days or weeks to retorque, believing that is how long it takes for tension loss to occur. Instead, SPC4® often indicates that it usually happens within hours of putting the mill back into service after a reline."

By retorquing much sooner, these mines achieve optimum tension on the bolts in their grinding mills, help eliminate early beachmarks that can lead to future fastener failure and put themselves in much better position to run their grinding mills for the next work cycle with no unscheduled stoppages.

Palmer cautions that all situations are different, and only usage of SPC4® in each specific condition can indicate exact retorquing periods, "but once they are installed, a wealth of operational information is now there for the operator." And what is learned informs future mill maintenance schedules, creates operational efficiencies, or reduces mill maintenance costs.

HOW VALLEY FORGE LOAD INDICATING FASTENERS ARE BETTER THAN OTHERS

- Measures actual bolt stress from 0 to 100% during assembly and in-service throughout operations. Users can see what load is achieved, whereas other load indicating fasteners only verify achievement of a factory-set load.
- ASTM F2482-08 Standard for Load Indicating Fasteners (F16 Committee) approved as a "Mechanical Dial Type"
- Lloyds Register Type Approval.
- Not affected by Nut Stand Off. Change in nut position does not effect accuracy.
- Manufactured in the USA, under one roof, with full manufacturing control.

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Valley Forge & Bolt Mfg. Co. manufactures patented bolting products for critical applications. Products are widely trusted for their unrivaled quality, extraordinary performance, and enduring reliability.