

Indian mineral sands producer improves grade and recovery of garnet

- Increased grade and recovery of garnet
- Minimized fines in the oversize material less than 10%
- Raised efficiency from 44% with conventional screens to 90% with Derrick® Repulp equipment

Background

A mineral sand producer in India was using conventional vibrating screen machines in a 0.30mm screening application to produce two garnet-rich intermediate products in two sizes. Subsequent stages required high screening efficiency in the wet circuit to recover final garnet and other high-value products. Avoiding misplacement of size fractions, especially garnet, was mandatory. The producer attempted to achieve these results using conventional vibrating screen machines, but a significant quantity of misplacement continued to occur. Consequently, the feed remained constant in the subsequent stage, and production of marketable garnet was low.



Derrick equipment is lighter and smaller than previously used conventional screening machines

	DERRICK 0.3MM CUT 0.35MM APERTURE	DERRICK 0.3MM CUT 0.39MM APERTURE	SITE DATA 0.3MM CUT 0.6MM APERTURE	SITE DATA 0.3MM CUT 0.6MM APERTURE
% +0.3mm in Feed	25.5	25.5	24.5	20.0
% -0.3mm in Feed	74.5	74.5	75.6	80.0
% +0.3mm in Oversize Product	90.9	97.9	29.7	23.1
% -0.3mm in Undersize Product	88.8	81.8	81.7	86.2
% Undersize Weight	82.1	90.8	46.2	33.2
% Oversize Weight	17.9	9.2	53.8	66.8
% Overall Efficiency	89.2	83.3	53.7	44.0

Figure 1. Test data from Derrick’s full-scale test lab in Buffalo, NY

Solution

To overcome the problem, in 2010 the producer extensively tested Repulp screens for the accurate sizing of garnet sand in Derrick's full-scale test lab in Buffalo. The main objective was to remove all material larger than 0.35mm from the product stream, as removal of the screen oversize material was essential to protect the downstream equipment from damage. The tests were highly successful as revealed by the technical data shown in Figure 1. Test results indicated that less than 10 percent fines (-0.3mm) can be achieved in the oversize material with Derrick Repulp screens. The overall separation efficiency attained in the lab test work was about 90 percent, while the efficiency had only been 44-54 percent with the conventional screens. In fact, the client reported that no measurable separation was occurring with the conventional screens. In other words, the discharged material was essentially identical to the feed. On the basis of the lab results, the client decided to replace the conventional screening equipment with three 4x10 Derrick Repulp screening machines.

The flow sheet shows the process utilizing the Derrick Repulp wet screening machines. Due to the very tight client product size requirements, panel apertures are changed occasionally, but no problems have been reported with the Derrick equipment.

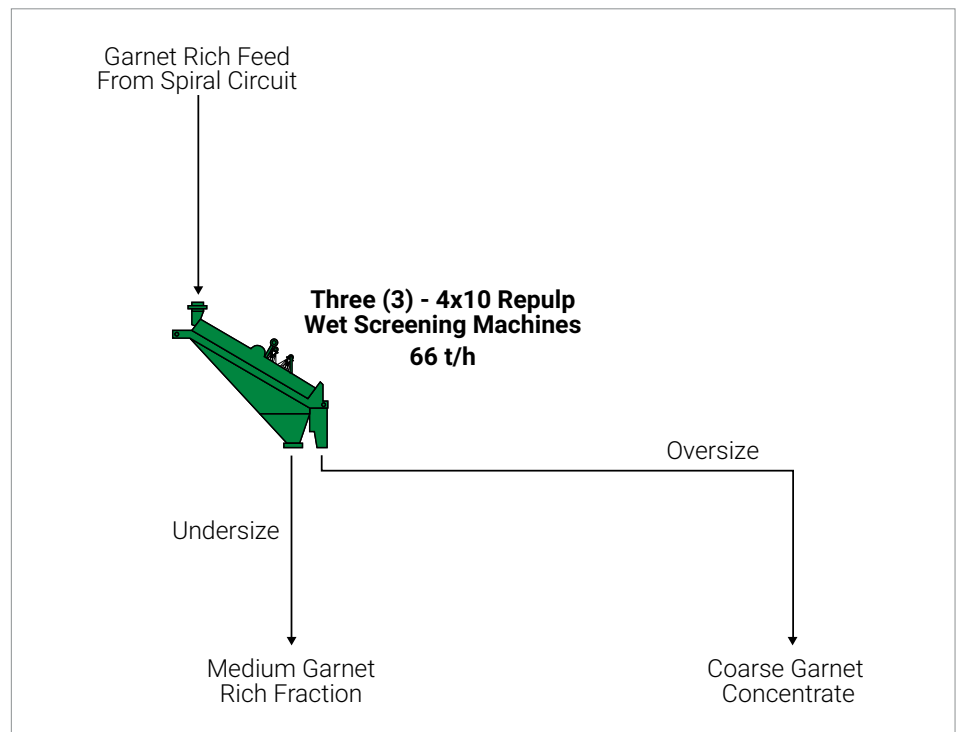


Figure 2: New flowsheet utilizing Derrick's Repulp Wet Screening Machines

Conclusion

Derrick's highly efficient fine screening technology has proved beneficial to the client, who is extremely satisfied with the performance of the Derrick screening equipment. They report that Derrick's equipment is lighter, smaller, and more compact than the conventional screening machines previously used. They also state that Derrick's equipment has increased their coarse garnet production significantly, and the product is cleaner. This benefit results in less work in the dry circuit, which provides more flexibility in the operation.

In addition, power consumption for two Derrick machines is less than the requirement for a single conventional screening machine! Consequently, a number of mineral sands producers in India are considering Derrick screen equipment for fine sizing applications.

For more information, please contact your local Derrick sales representative.

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