Rotary Debarker Performance Optimization

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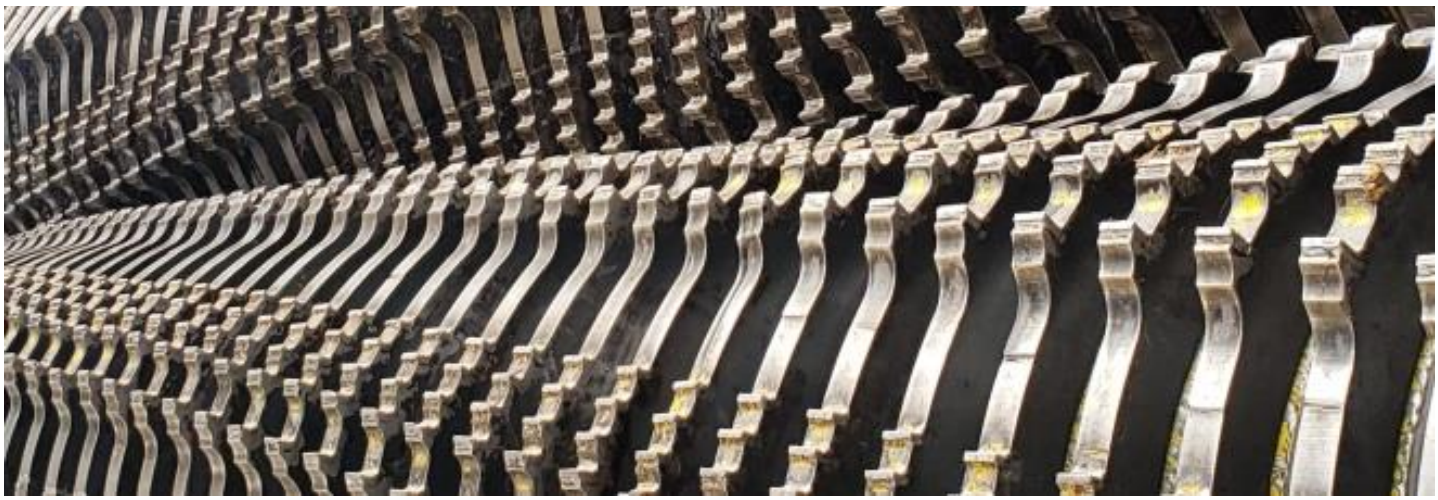

Rotary Debarker Performance Optimization

The Rotary Debarker technology advantage allows excellent bark removal with minimal white wood loss. The open bottom design and abrader to log contact within the debarker are the mechanical technology advancements that make this possible. However, as with all equipment, operational parameters and mechanical setup are crucial to optimize performance.

Figure 1 - Rotary Debarkers Rotors. The Abrader design and open bottom of the debarker are unique design parameters.

Operational Parameters

Retention Time

To maximize production, retention should be at the minimum time required to achieve final bark targets. Too high a retention time results in high white wood losses; too low results in high bark content (assuming all other parameters are constant).

In a side discharge debarker, the retention time is primarily set by batch duration. However, rotor speed is also a factor. Low rotors speeds are desirable to minimize loss of white wood but rotor speeds that are too low can increase the batch duration needed to achieve target bark content. Increases in needed retention time will negatively affect production capacity.

Figure 2 -Side Discharge Rotary Debarker

In an end discharge unit, the retention time depends on rotor speed, gate height and debarker slope. In units with active tilt, the debarker angle can be adjusted to affect retention time. Typically the tilt angle (slope) is fixed during design by considering the wood diet and environmental conditions. The operational target should be to deliver the capacity and the cleanliness levels desired with the lowest gate height and the lowest rotor speed. This will result in the lowest white wood losses and highest stem quality.

Figure 3 - End Discharge Rotary Debarkers.

Gate Height

Gate height should be used to select the appropriate loading and dwell time of the stems within the debarker. When the debarker discharge gate height is increased, the wood level inside the debarker increases. The increased load level does two things:

1. Increases retention time in the debarker, and
2. Increases debarking rate by increasing the loading level. The higher level increases log to abrader tool pressure which, in turn, reduces the time it takes for the bark to wood bond to breakdown.

Figure 4 - Gate Height on End Discharge Debarker is Critical for Debarker Efficiency.

When gate heights are increased resulting in additional loading inside the debarker, a side-effect is often a reduction in rotation and/or movement of the logs inside the debarker. When that occurs, the rotor speed should be increased, gradually, to where the log movement returns to a 'loose fluid' characteristic. This is, of course, a judgment call by the operator but the 'loose fluid' description can be easily identified when it is achieved.

Rotor Speeds

Rotor speeds should be used to increase or decrease circulation of logs within the debarker. Increasing rotor speed, of course, results in improved log movement as well as an increase in abrader to log contact frequency. Increased rotor speed is beneficial to a limit. If the logs begin to leave the floor of the debarker (an effect often referred to as 'pop corning') then rotor speeds should be reduced as debarking performance will be diminished.

Consistency of Feed

With an end-discharge debarker, the retention time can result in a considerable lag between making an operational change and seeing the result. Depending upon the size of the system, the delay can range from 5 to 20 minutes. With long retention times, rapid changes in feed can happen faster than an operator or automatic system can react based on debarker output. Therefore, maintaining a consistent log flow rate is one of the most critical items to ensuring optimum performance. Where the system is well designed and the delivery of wood fibre to the infeed decks is steady and predictable, this is not difficult to achieve.

Large swings in feed rate can result in under or over debarking with no reasonable method of control. The same can be said for a highly variable log diet. Rapid changes in species, log

diameter, crookedness or temperature can make it difficult to control the operational parameters to optimize debarking.

Figure 5 - Infeed Deck to Side Discharge Unit Fully Loaded.

Design of the system is also a critical component in feed rate consistency. Where the infeed or outfeed system has design challenges often it is impossible for the operator to compensate sufficiently to ensure that the debarking quality does not suffer.

Good control of infeed rates and species will give the greatest opportunity to fine tune the debarker

MECHANICAL

Rotary debarkers are known for their low maintenance requirements. Ensuring that the abrader tips are in good condition is critical in ensuring you achieve the full benefits of your debarker capability.

To prevent damage to the abrader segments and blocks, abrader tips require attention BEFORE you notice a reduction in ability to maintain historical log charge rotation or movement inside the bin.

Most rotary debarkers are available with a variety of different abrader tip styles, depending upon bark characteristic, to suit the requirements of your species and log condition which cannot be suitably addressed by changes in loading and rotor speeds changes.

Figure 6 - Block-type Abrader Tips

Some debarkers are fitted with either on the fly adjustable or manually installed **stationery abrader plates** to improve debarking in difficult conditions or species. These tools can be placed to interfere with the log flow but will, as the stationery tooling becomes more prominent into the debarking chamber require an increase in rotor speed to maintain the appropriate log movement.

Recycle conveyors are one of the best ways to reduce white wood losses while maintaining log thru put and cleanliness levels in a continuous feed and discharge rotary debarker, especially where mixed species are part of the diet. Infeed rates, gate height and rotor speed, of course, need to be set to factor in the impact of increased log flow from a source other than the primary infeed conveyor. Once these set points are established the debarker's performance is still optimized in the same manner.

SUMMARY

Consistency of infeed material flow rates is the best way to achieve optimum performance from your rotary debarker.

The system should be in good mechanical condition, the gate height and the rotor speed should be as low as possible while still achieving the production thru put and cleanliness levels required of the facility. If an increase in log cleanliness is desired, the gate height should be increased slightly. Where this increase in gate height results in a noticeable loss of log movement, the rotor speed should be increased - slowly - until appropriate log movement is returned.

Figure 7 - Debarked Logs on an Outfeed Deck.

If over debarking is noted, in the discharged gate height and rotor speed should be reduced simultaneously in small increments until the desired improvement is noted.

When we speak of adjustments of gate and rotor speed a slight adjustment would be considered a gate movement of 2 or 3 inches and a rotor speed change of 2 or 3 rpm. Be sure and wait a suitable time to see what the impacts of your changes are before taking further steps.