



Care for the rope assembly

USER MANUAL

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Care for the rope assembly

A guide to diagnosing and eliminating problems

Here is an overview of the key operational and maintenance considerations for keeping the Floveyor's high velocity rope assembly in sound working order. While it provides instructions for trouble shooting the most common problems, it is not a substitute for expert technical advice.

Floveyors' high capacity and low power consumption make them an excellent choice for batch type operations. The key to long term low maintenance operation lies in caring for the rope assembly and replacing it as needed.

Any aero-mechanical conveyor is only as strong as its rope assembly. It is the conveyor's arterial system essential to maintaining an effortless flow of diverse and often challenging materials.

Understand average rope life

As the Floveyor's key consumable, the rope assembly on average will have to be replaced after between 3,000-5,000 operational hours.

A timely and correct maintenance regime can extend the operational life of the rope assembly to in excess of 5,000 and 8,000 hours. A poorly maintained Floveyor with an over tightened assembly may have a replacement time as low as 100 or 200 hours. Other contributing factors to early rope assembly replacement include, poor operational set up and neglecting to monitor and replace worn components.

Replacement timing is influenced by particular material characteristics and specific operational practices.

For example:

- > A poorly maintained Floveyor conveying extremely abrasive materials with an over or under tensioned rope assembly will require a replacement assembly much more frequently
- > A Floveyor given correct preventative maintenance and conveying very light and gentle materials such as flour or dry tea can operate for well over 6,000 hours before needing a replacement assembly

TOP TIPS

- * Minimise operational hours where possible
- * Avoid 'running on empty' unnecessarily, although there is no product in the system this can still fatigue the wire and decrease the rope life

Tensioning the rope correctly

NOTE: A video demonstrating how to tension the rope assembly correctly is available on our website at <http://www.floveyor.com>

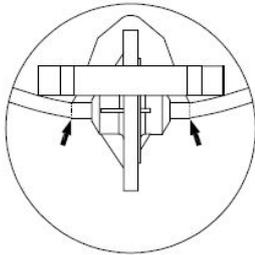
Checking the rope tension is integral to preventative maintenance. The tension may not need to be adjusted, but it should be checked.

Always adjust the rope tension when there is no material in the tubes. Rope 'stretch' is more significant on a longer and/or heavily loaded Floveyor. The best method to adjust tension is to have access to feed housing.

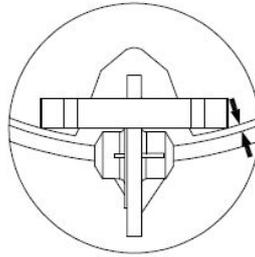
Excessive or unusual noise may signal a problem such as: a foreign object caught in the conveyor, a vibration caused by a loose fitting, damage to the tube sections or incorrect rope tension.



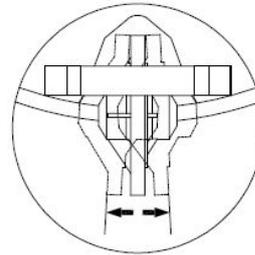
Check the tension from the Feed Housing, ensuring the rope assembly sits neatly on the sprocket.



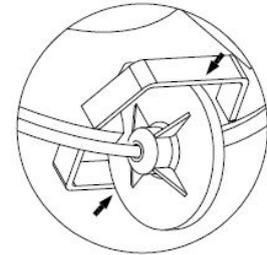
A



B



C



D

- A. The rope must not be over-tensioned; this will lead to rapid weathering
- B. The rope must not hang from the rim of the lower sprocket, they should be just lightly touching
- C. Ensure discs can slide freely backwards and forwards in the sprocket notches
- D. Ensure there is adequate clearance between the brackets and the discs

TOP TIPS

- * Try not to monitor and adjust the tension from the discharge housing. Note: On long conveyors this may give a false sense of tension, due to the weight of the rope assembly. Many times the rope assembly will appear to be in proper tension, when actually the rope is not actually seated on the inlet sprocket.
- * Do not rely on sound or lack of sound as a reliable indicator of the tension status of the rope assembly

Care for new rope assemblies

The greatest stretch occurs when the rope is new, so it is vital to monitor and adjust the rope for slackness and stretch during its first operating hours.

TOP TIPS

- * Monitor and adjust a new rope assembly at intervals of 1, 4 and 8 hours until tension settles
- * Schedule regular checks as a routine maintenance measure

Understanding disc wear

Floveyor's rope assembly discs are manufactured from either Polyurethane or Polypropylene. Non abrasive powders conveyed under normal operating conditions will not cause disc wear.

However using a high velocity aero-mechanical system to convey abrasive materials can cause excessive disc wear. For this reason Floveyors are not generally used for highly abrasive products.

Interpreting disc wear patterns

Disc wear can result from a number of factors. Check the shape and location of the wear to help diagnose the cause.

- > Egg shaped discs can result when the rope assembly is too loose, and the discs are contacting the feed housing wall
- > Discs with worn front and back bosses can indicate incorrect tension or issues with worn sprockets
- > Uniform wear around the outside diameter of each disc is probably caused by abrasive products

Understanding wire fatigue

Wire fatigue is a major indication that after millions of circuits round the sprockets, the rope assembly is at the end of its working life.

It is common for the wire to break at the join first. However closer inspection usually reveals wire strand damage all along the rope assembly.

TOP TIP

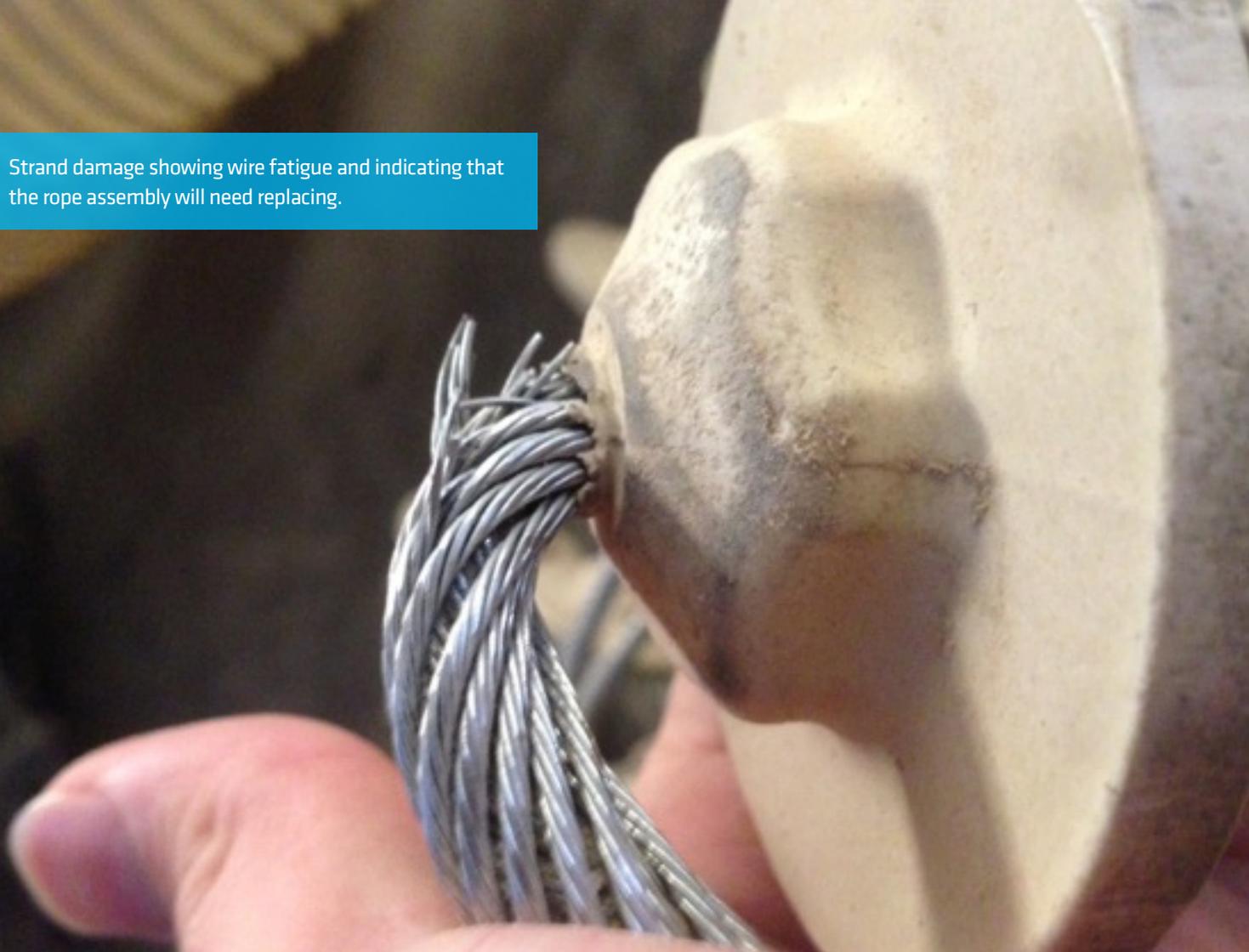
- * Replace an entire worn or frayed rope assembly at the first sign of fatigue to avoid product contamination and minimise equipment downtime

Note: Careful maintenance, correct operation and regular tensioning will prolong the life of the rope assembly.

Identify incorrect tension

Tightening the rope assembly until it resembles a piano wire can be the fastest way to destroy a new assembly. Depending on the degree of over tension, sprockets, shafts, and bearings can also fail due to the extreme load put onto these components.

Strand damage showing wire fatigue and indicating that the rope assembly will need replacing.



Causes of over tension

- > Lack of training for maintenance personnel who may misguidedly believe that tensioning the rope until the Floveyor runs silently or there is no slack in the rope is the correct procedure.
- > Accumulation of difficult powders on the outer radius of the sprocket rim, under the wire of a polymer coated rope assembly. This causes the pitch circle diameter (PCD) of the sprocket to increase, leading to natural over tension.

Note: This is a rare occurrence involving a very small number of materials

Identifying over tension

There are clear, distinguishing signs of an over tensioned rope, including:

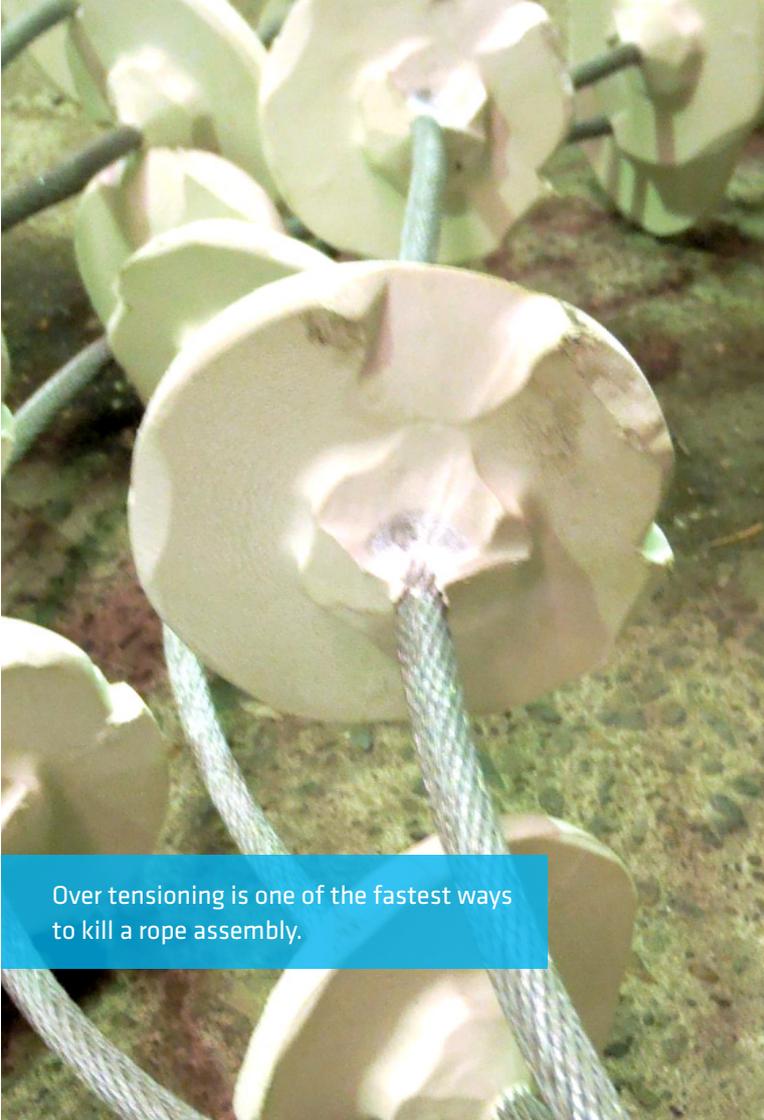
- > Being unable to move the discs back and forth in the notch by hand

- > Prominent grooves cut in the back of disc and into the disc boss (centre) as a result of the disc moving forward on the idler sprocket and trying to 'walk up' out of notch onto the sprocket rim

TOP TIPS

- * Follow the Floveyor team's advice on correct tensioning procedures.
- * In the rare instance where your product is one of the very small number likely to contribute to over tensioning of polymer coated rope assemblies, contact Floveyor for advice

Note: In most instances Floveyor has identified the half a dozen powders likely to contribute to natural over tensioning and we will usually discuss with you in advance. However, raw material conditions change based on supplier, geography, and environment. Consequently, Floveyor cannot always assure that the issue of natural over tensioning by caused by a small group of flow resistant powders may not arise.



Over tensioning is one of the fastest ways to kill a rope assembly.



Excessive tension flattens the wire over the notch edges, leading to wire fatigue and breakage.

Loose tension

Loose tension is often a result of 'set and forget' style maintenance. An unexperienced maintenance team will install a new rope assembly, tension the unit and then neglect it until the rope assembly fails and needs replacement.

A neglected rope assembly will loosen until eventually the disc begins to drag on the bottom of the feed housing. This drag causes the disc to twist and develop a radius on its front edge. Disc dragging and twisting causes wire fatigue, which is rapidly followed by early rope assembly failure.

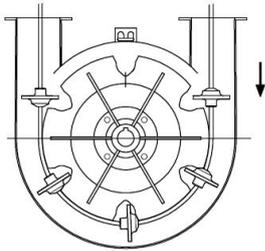
Identifying loose tension

- > The disc is pushed out of the infeed sprocket notch as the loose wire can no longer keep it positioned correctly
- > Rounding of the outer radius of the disc indicates slight loose tension
- > Damage to the boss which although common is not always present

TOP TIPS

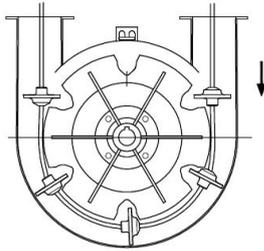
- * Monitor the sound of the conveyor. A Floveyor with a loose rope assembly will get noisier when running and sound as if the rope assembly is slapping around in the tubes
- * Do periodic preventive maintenance inspections as the rope assembly will continue to 'stretch' during its operation

1



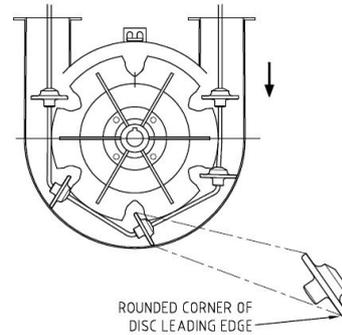
Normal Tension

2



Rope too loose off sprocket rim

3



Rope too loose, disc dragging on boot wire becomes overtight premature breakage

Manage jams and jumps

Jamming the Floveyor and breaking the join

Despite Floveyor's enclosed design and operators' best efforts, it is surprisingly common for foreign objects to enter the conveyor especially where operators are less skilled. Contaminating foreign objects can take many forms, from knives, spanners, screwdrivers, plastic bags, string and ropes, broken pallets and many more.

Assess the impact of jamming

Typically, a Floveyor will stall when a foreign object dropped into the product stream jams the sprocket. In worst case scenarios, this sudden strain can snap the rope assembly and damage sprocket brackets and other components. It is very important to take the following steps after a jamming incident.

- > Assess any damage to the rope assembly
- > Check for bent discs, joining discs pulled apart and snapped wire
- > Discuss the viability of repairing the assembly with an authorised service agent before carrying out any 'in house' repairs as poor repair work can often lead to rapid failure

In circumstances where the contaminating object is disposed of during a post jam cleanout, inspecting the damaged components will often show the cause of the failure. If the rope assembly has failed at the joining discs there will often be 'puckering' of the joiner, where the sheer force of the jam has ripped out its wire.

Before being supplied, Floveyor's rope assemblies are quality tested for load strength in excess of one metric tonne. Consequently, the force required to snap a join is fairly significant and this will not happen during normal operation.

Inside surface of the REF (Rope End Fitting) indicating significant stress on the join, often seen when a Floveyor is jammed or started under load.

Jumping / walking the Floveyor rope

It is possible in exceptional circumstances, to walk the rope assembly out of the sprocket brackets and onto the rim on the idler end.

This typically happens when machines are moved to new applications on site or sold to a new user for handling products with difficult characteristics not addressed in the Floveyor's original specification.

Sometimes there will be no damage when the rope assembly has been walked out of the sprocket, although the added stress to the wire will decrease its life expectancy. In other instances, the act of 'walking out' the Floveyor will cause damage to the discs, which may be able to be repaired fairly easily onsite.

TOP TIPS

- * Use a vice or vice grips to try and straighten any damaged Polyurethane discs so the face of the disc surface is relatively flat
- * Seek technical advice as soon as possible to address the causes of the issue prior to continued handling of the problematic material

- * Use a small screwfeeder to regulate the feed of product into the Floveyor. This provides a controlled environment, which aids as a buffer for the system eliminating walking out issues in most instances

Chemical Attack

Chemical agents, washing solutions, and acids are often the cause of premature failure of non-stainless rope assemblies. Even Floveyor's polymer coated ropes contain a galvanized wire (Zinc) interior, which can be susceptible to aggressive chemicals.

Rusting around the wire or joiner can occasionally be seen as evidence of chemical attack on a rope assembly in apparent good condition.

TOP TIP

- * Review the chemical suitability of handled product and the resistance of the rope assembly to guard against chemical attack



Walking out a rope assembly can bend and damage certain discs, in most instances these can be repaired onsite.





Get in touch with us

Contact us to streamline your bulk material handling operations.

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