



Maintain and repair

USER MANUAL

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Maintain and Repair

Technical support to maintain and repair aero-mechanical conveyors

Here is an overview of essential maintenance designed to minimise wear and tear and keep a Floveyor in sound working order. Please note that these maintenance instructions and information regarding repairs, which can be completed on site, are not a substitute for expert technical advice.

Schedule preventative maintenance

Preventative maintenance is essential for long term operational success of any mechanical equipment.

Unplanned, reactive maintenance costs on average, three to nine times more than planned maintenance. These costs are incurred on every level; disrupted production, time lost responding to emergencies and diagnosing faults and higher costs for parts and shipping.

Control costs by planning maintenance so that equipment shut down coincides with production downtime. Organise all required parts, supplies and personnel prior to shut down to minimise the down time for any repairs. These measures decrease the total cost of the maintenance.

TOP TIPS

Keep your high performing Floveyor in top condition by:

- * Conducting preventative maintenance on time and on schedule
- * Providing comprehensive training for operational personal
- * Watching for the tell-tail signs of early wear
- * Understanding the rope assembly as a consumable
- * And last but not least... never drop strange objects into the Floveyor.

Minimise cleaning with total batch transfer

Floveyors deliver total batch transfer with negligible product residue within the system. For example conveying 15m³ of cake mix to a packaging line produces just a handful of residue within the Floveyor post transfer. This uniquely hygienic attribute means Floveyors can process a series of different materials without time consuming strip down and cleaning between batches.

Some materials with particularly 'sticky' characteristics may increase the Floveyor's susceptibility to accumulating internal residue. We recommend product testing these materials to identify the best method for residue removal.

Clean three ways

Floveyors accumulate minimal residue. This makes for straightforward cleaning using the options best suited to specific materials and applications.

Dry cleaning

We recommend installing simple dry cleaning accessories to significantly reduce any residue remaining after transfer. These include:

- > strategically placed air nozzles within the housings and tubes to purge any settled product back into the stream
- > scraper and brush discs added to the rope assemblies
- > easily removed access covers to inspect the system

Inert purging

This simple efficient form of cleaning is an excellent alternative to wet washing.

We recommend planning your production run to end with a small batch of neutral product to purge any residue film from earlier materials. For example conveying a batch of flour last will purge the residue from food products with a variety of additives. Alternatively inert materials such as granular salt or broken rice will also flush out residue film and are very effective for cleaning purposes.

Wet wash down

Floveyors handling materials such as: allergens, various spices, bacterially susceptible powders and hygroscopic materials may require wet wash-down.

This is an effortless process due to the Floveyor's ability to convey liquids at a high speed.

Here is the simple 5 step process:

1. Blank off the discharge chute with a Washing Plate Cover
2. Rinse the system with warm water and drain via the drainage plugs.
3. Add a washing solution and recirculate within the Floveyor to flush the internals
4. Drain the liquid via the drain plugs
5. Rinse and allow to dry or accelerate the process by blowing compressed dry air into the system or running the Floveyor empty.

We can supply a variety of cleaning solutions from full Clean in Place (CIP) solutions to simple bolt on washing plate covers.

Care for tubes

Long serving Floveyors will continue to perform efficiently provided the tubes are kept in good condition or replaced appropriately when wear characteristics begin to show.

Protect the tubes from dents

The Floveyor tube walls are generally 1.6mm thick and it is important to protect them from impact damage from forklifts, operator movements or accidental blows from tools.

Dented tubes can seriously effect the Floveyor's operation in a number of ways.

If a disc in the high velocity rope assembly comes in contact with a dented section, this will increase the stress and fatigue on the wire and reduce the life of the rope assembly.

The protrusions caused by dents in the tubes will also create fast wearing, weak points in the conveyor. This will lead to pin holes in the tube wall that will eventually leak dust.

In instances where the dents are allowed to wear, creating

holes and the Floveyor continues to operate, sharp metal lips will form on the tube. As a result of the high velocity movement of the rope assembly, the discs will make contact with these sharp sections damaging their outer radius, leading to product contamination and significant wire fatigue.

TOP TIPS

- * Locate the Floveyor to minimise the risk of collisions with forklifts or impact damage of any sort
- * Ensure adequate protection if the equipment is installed in a high movement area
- * Replace dented tubes before they cause issues for the rope assembly

This long indented section of the Tube will cause a lot of problems in the long-term if left unrepaired.



Repair tube sections carefully

The Floveyor rope assembly must travel through a smooth internal surface.

Sub-standard repairs in tube sections, including poorly welded tubes, and ill fitting replacement sections, can significantly reduce the life of the rope assembly. Discs will get damaged if they hit the sharp internal edges of a poor repair job, causing wear and tear on the entire rope system.




Weld penetration from these poor quality repairs will potentially damage the rope assembly.



Align repaired tube sections accurately

This example of repair work on the return leg of a F5 Floveyor illustrates the dangers of misaligned tube sections. This tube insert is clearly not aligned with the rest of the sections. Furthermore the poor quality of the welding increases the likelihood of a sharp internal bur/lip that would damage the outer radius of the discs, stressing the wire and increasing potential for polyurethane wear.

These misaligned tubes are also potentially of different sizes. An inspection and a sound check clearly indicate that circulating rope is hitting against the inner lip of the tube. This will cause a great deal of stress on the wire of the rope assembly. Damage and chips taken out of the outer radius of the polyurethane discs will be visible as a result of the fouling.

A vertical industrial tube assembly, likely part of a Floveyor system. The tube is made of metal and has several blue repair bands or sleeves wrapped around it. The welding at the joints between the tube sections is poor, showing gaps and uneven surfaces. The blue bands are also misaligned with the tube sections. The background shows a dark industrial setting with other pipes and structures.

Poor quality welding and misaligned tube sections can severely stress the rope assembly

Replace tubes

Floveyor tubes are a precision component in aero-mechanical conveying. Replacing these parts outside the original specification for the conveyor is likely to cause problems for a variety of reasons. It is important to source appropriate replacement tubes.

Here are the three most common problems associated with using unspecified replacement tubes:

Incorrect tube length

- > Floveyor tube lengths are accurate to +/- 1mm. Using a replacement tube outside this accuracy range will affect the rope assembly tension range. Excessive length differences will completely alter the standard rope assembly required to run the Floveyor

Incorrect wall thickness


- > Floveyor tubes are made with smooth 1.6mm internal walls. Replacement tubes with wall thicknesses outside this specification will increase resistance and minimise clearances for the rope assembly resulting in excessive stress on the entire system

Sharp transitions between sections

- > Floveyor tubes must have smooth transitions between sections. Repaired or replacement tubes often have sharp transitions that damage the rope assembly as it travels. Replacing tube sections with un-chamfered replacements will lead to significant operational issues

TOP TIP

- * Contact Floveyor, or an authorised service agent before replacing a damaged or worn section or entire tube



These grooves, cuts, chips out of the outer disc radius are due to poor transitions causing the circulating discs to hit the adjoining tube.

In summary

Protecting the Floveyor's tubes from impact damage and replacing them with factory approved ones will greatly lower the risk of damage to the rope assembly. This will save costly downtime to conduct further unscheduled maintenance and repairs. Poor quality welding and misalignment of repaired sections will also undermine the smooth operation of the Floveyor's rope assembly

Know the signs of a damaged tube

- > Feathered edges on discs
- > Gouges taken out from discs
- > Plastic debris in product
- > Excessive noise

Know the signs of a damaged tube

- > Have the tubes been replaced?
- > Are they supplied by Floveyor?
- > Do they have the correct 15° chamfer to an almost sharp edge on the non-flanged ends in particular?
- > Do the tubes have any dents or damage likely to interfere with the discs?
- > Are the tubes the correct Floveyor size and type with no internal fins?

Care for key components

Care for bearings and seals

Check the Floveyor bearings and seals regularly. Once seals fail and product finds its way into the bearings, these will also fail.

Check the bearing bosses regularly for heat build-up and noise during operation, as a failure of bearings will often show in these areas. Alternatively, while inspecting the rope assembly for correct tension and any signs of damage, rotate the sprockets by hand. If a sprocket is very difficult and clunky to rotate, this can indicate there has been a bearing failure, as bearings should rotate freely and be unimpeded.

Replacement time for these components varies for every installation and can be anywhere from annually to every 10 years. In critical situations some companies choose to replace the bearings and seals on a regular scheduled basis every 12 to 18 months.

Hazardous zoned Floveyors must incorporate temperature probes, which will warn if a bearing failure has occurred. Where bearing temperature probes have been supplied it is critical to periodically check that they are working as intended.

TOP TIPS

- * Do the routine checks to confirm that all the Floveyor's moving parts are operating smoothly and without resistance
- * Check the Floveyor thoroughly at the first sign of any issues with the rope assembly as a bearing failure can contribute to premature rope assembly failure due to the increased loads


Insist on quality repairs to the Floveyor housings

The Floveyor is generally fabricated out of mild or stainless steel and is capable of being patched or repaired in some instances.

However poor quality repairs and patch jobs can cause more harm than good. Although they may look fine superficially, if the internal surfaces are not ground flush without any internal ledges, cracks or crevices, serious internal problems can compromise the Floveyor's operation. These include, damage to the rope assembly and product contamination and blockages where material builds up in opening and ledges.

TOP TIPS

- * Replace any damaged components with Floveyor's authorized spare parts
- * Alternatively: Return worn or damaged components to Floveyor, or an authorised agent to inspect and carry out the required work

A close-up photograph of a mechanical component, likely the internal surface of a feed housing. The surface is dark, metallic, and shows significant wear and damage. A thick, vertical, light-colored material, possibly a rope or cable, is visible on the left side, appearing frayed and caught against the surface. The background is dark and out of focus.

This roughly repaired internal surface of the feed housing has several places where the rotating rope assembly discs can catch and become damaged.

Manage sprocket wear

The Floveyor sprocket has guides on each side of the surface on which the discs sit. This ensures that the rope assembly stays engaged with the sprocket.

Over the life of the conveyor, the sprocket edge where the rope rides will eventually wear. This wear rate will vary depending on the quality and regularity of maintenance and the abrasiveness of the product. It is important to inspect the sprockets periodically to guard against damage to the rope assembly.

As the diameter of the sprocket wears, the discs engage differently in the sprocket causing the bosses (front and rear sections of disc) to wear. This wear can lead to sharp edges on the sprocket notch, which will damage and cut the rotating wire.

Diagnosing sprocket wear

Normally the edge of the sprocket is flat, without a groove. However recognising sprocket wear can be difficult for inexperienced users. Sometimes a worn groove around the periphery of the rim is so smooth and uniform that it appears to have been machined in the rim by the manufacturer.

TOP TIPS

Ask these questions when inspecting the sprockets:

- * Are the sprockets worn at all?
- * Is the outside rim diameter still flat or has it been worn in a hollow under the wire?
- * Are the brackets that guide the discs worn or damaged?
- * Is the centre of the sprocket rim running central to the Floveyor tubes or is the sprocket more than a few millimeters above or below the tube centre line?


Look for these signs of damage:

- * Outside rim is worn down with groove cut
- * Notch edge is badly worn
- * Sharp edges on the sprocket notch sections
- * Brackets worn down or bent out of shape



This sprocket shows extreme wear and may be affecting the rope assembly.

A close-up photograph of a single tooth of a metal sprocket. The tooth is heavily worn, with the top edges rounded and the surface pitted. The sprocket is painted blue, but the paint is chipped and peeling, revealing the underlying metal. The background is dark and out of focus.



Sprocket wear has reduced the pitch of the rope assembly and changed the alignment of the rope.

A close-up photograph of a rope assembly (a series of interconnected metal links) passing over a worn sprocket. The sprocket's teeth are significantly worn down, causing the rope assembly to sit lower and at an angle than it would on a newer sprocket. The rope links are metallic and show some rust.

Check that the sprockets are running central

Many older Floveyors have the potential for the sprockets to be out of alignment.

This problem can be easily overlooked when mistakenly assuming that a tight sprocket and bearing boss will ensure the sprockets run central.

Sprockets can run out of alignment for many reasons, including damage, warping of the back plate, and stress from the drive arrangement if the unit is stalled, jammed or started under load.

TOP TIP

- * Check both housings to ensure the sprockets are running central on every axis. This is critical to ensure the rope is running central through the tubes and not fouling with the housing legs, stressing the wire and leading to premature failure

Normal clearance indicates that sprockets are running central.



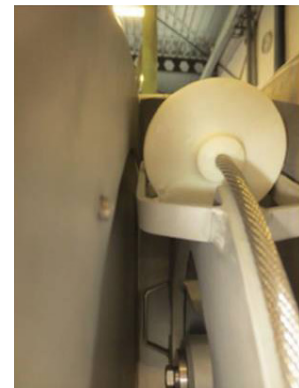
Top view discharge housing



Normal clearance at product side



Tiny clearance at return side



Normal clearance at housing cover product side



Minimal clearance leads to the disc fouling as it rotates.



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