Material Handling

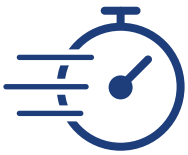
Clean Flight® Wing Pulley

Keep your employees safe while extending conveyor belt life and increasing yield

The Clean Flight® wing pulley screw helix geometry is inspired by the industry-leading Martin screw conveyor design. This unique flight pattern drastically reduces wing stress during operation to prevent wing folding that causes unplanned downtime. Additionally, the geometry maximizes material removal efficiency between flights in order to prevent conveyor belt damage. Thicker flights combined with a screw helix geometry reduce material carryback and extend belt life; offering improved uptime and preventing maintenance employees from having to manually remove material from the tail section. Factory assembly from a single source delivers a ready to install solution upon delivery, resulting in reduced freight costs, consistent quality control, and a fast installation.

Extend conveyor belt life

Reduce maintenance and operate safely



Easy to order and install

Extend conveyor belt life

Expel material from flights to protect the belt

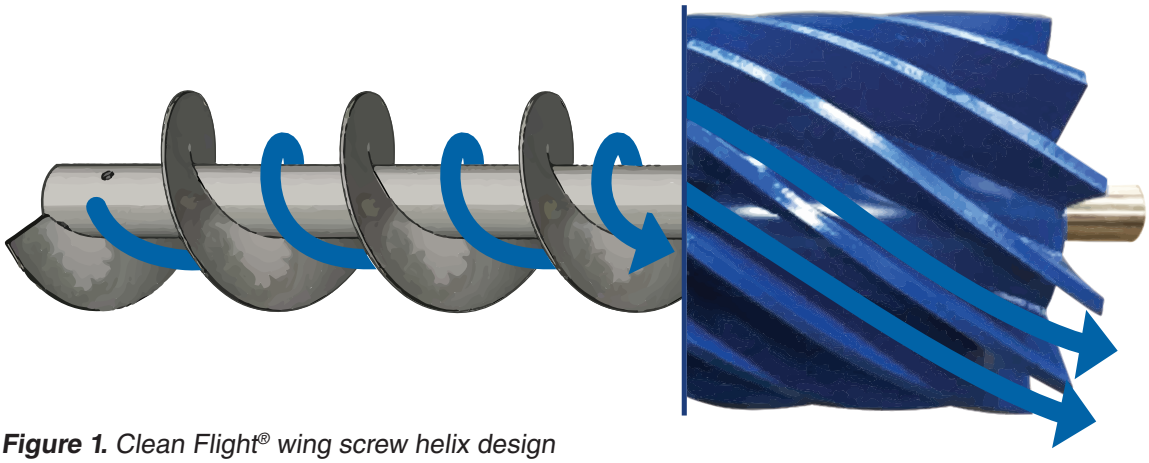


Figure 1. *Clean Flight® wing screw helix design*

Material build-up between wings of a tail pulley is a common occurrence, resulting in the inability to properly clean and causing damage to the belt. The reason for this challenge is the axial material expulsion path which does not allow material to flow through an efficient route during operation.

The screw conveyor design has been a popular conveying method for centuries due to its ability to effectively move material with minimal losses. Martin has been the screw conveyor industry leader since 1969 and has utilized this expertise to design a self-cleaning pulley that allows for the easiest material expulsion path during operation. Martin's Clean Flight® wing pulley (*Patent No. US 9,434,552 B2*) applies a helix geometry (Figure 1) to replicate the movement of material through a screw conveyor seamlessly to the point of ejection. This unique design ensures material does not cycle through the belt and prevents build up between wings during operation. Efficiently shedding material keeps the conveyor belt clean and offers longer life.

Expel material from flights to protect the belt
Documented Cost Saving

Eliminate wing folding to protect the belt
Documented Cost Saving

Extend conveyor belt life

Eliminate wing folding to protect the belt

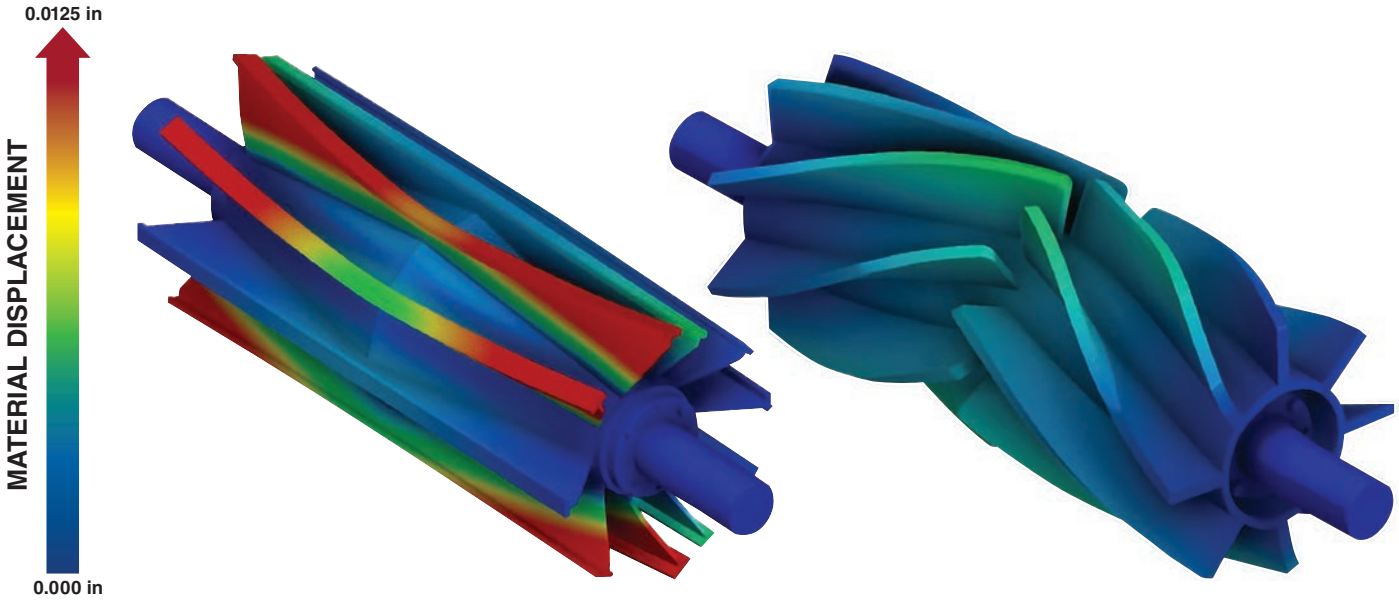


Figure 2. *Finite element analysis (FEA) comparing traditional wing versus Clean Flight® wing*

During operation, the highest stress area of a wing pulley is on the outside diameter of the wing. Normal operating conditions or increased belt tensions can result in wing folding which not only leads to pulley failure but also risks permanent damage to the conveyor belt. Martin's Clean Flight® wing pulley is constructed with thick, cold-formed flights in a screw helix pattern positioned perpendicular to the core. This unique flight design eliminates the high-stress areas that cause premature failure and damage to the belt.

The core is made from ½" wall pipe which can accommodate continuous welds, strengthening the flights to prevent wing folding during operation. The finite element analysis, seen in Figure 2, shows the material stress resulting from the belt tension experienced in a belt conveyor application with 30 HP running at 400 FPM.

The traditional wing pulley on the left shows extreme, high stress areas concentrated only at the wing. Whereas, the Clean Flight® wing pulley shows no high stress concentration and evenly distributes the load throughout the pulley. Proving that the Clean Flight® wing pulley achieves higher load ratings and double the expected life compared to a traditional wing pulley.

The screw helix pattern and flight construction is proven to offer the longest life of any self-cleaning pulley. Eliminating wing folding prevents catastrophic damage and extends conveyor belt life.

Reduce maintenance and operate safely

Expel material from flights for safer cleaning

During operation, material being conveyed gets lodged between wings causing damage to the belt. Additionally, conveyed material sticks to the belt and carries along the return side of the conveyor eventually dropping onto the ground in piles.

Martin Clean Flight® wing pulley's unique wing pattern reduces material carryback and displaces material from the flights. This design allows maintenance to spend less time cleaning and reduces the risk of harm to the employees shoveling out material or cleaning piles from under conveyor. Figure 3 displays a comparison of maintenance requirements between a traditional and a Clean Flight® wing pulley.

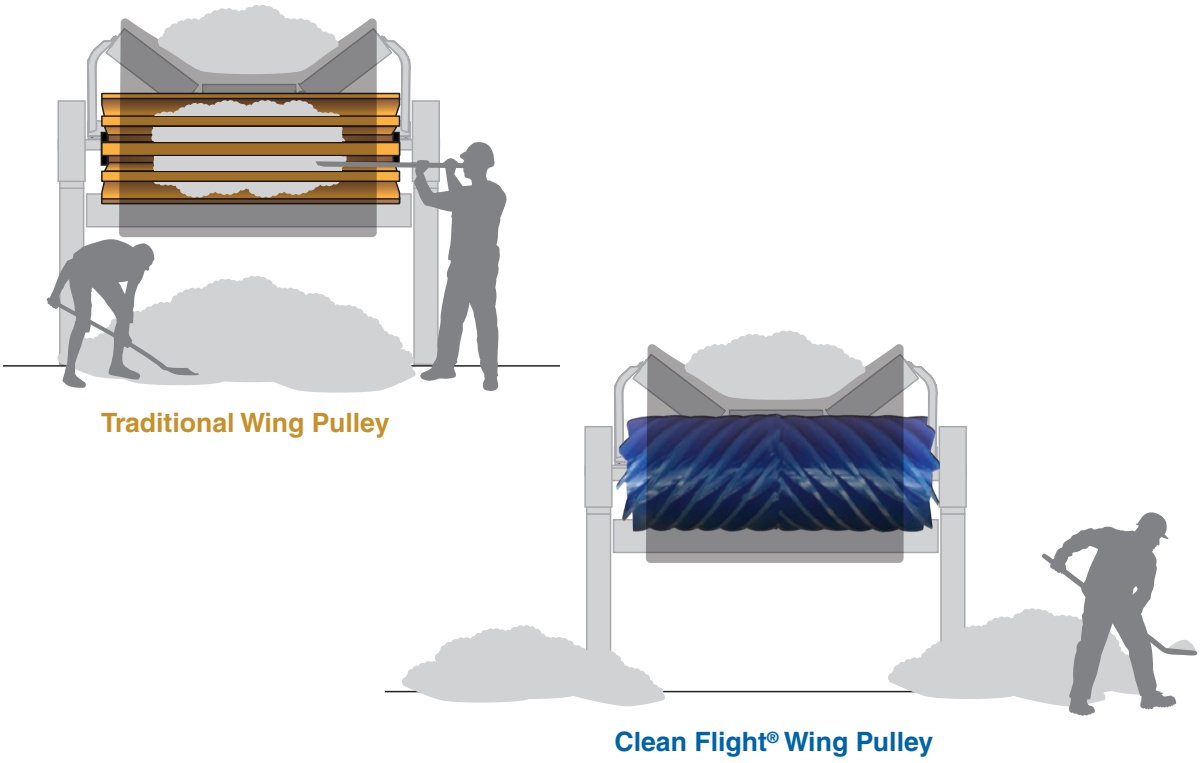


Figure 3. *Maintenance comparison between traditional and Clean Flight® wing pulley.*

Reduce maintenance and operate safely

Less noise & vibration with constant contact

Constant belt contact (Figure 5) during pulley operation reduces noise (Figure 4) and vibration. Less noise protects the hearing of employees and prevents any adverse impact on the surrounding community while operating within OSHA guidelines.

> *OSHA requires employers to implement a hearing conservation program when noise exposure is at or above 85 decibels averaged over 8 working hours, or an 8-hour time-weighted average (TWA). Hearing conservation programs strive to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and hearing protection devices necessary to safeguard themselves.*
>
> *www.osha.gov/noise*

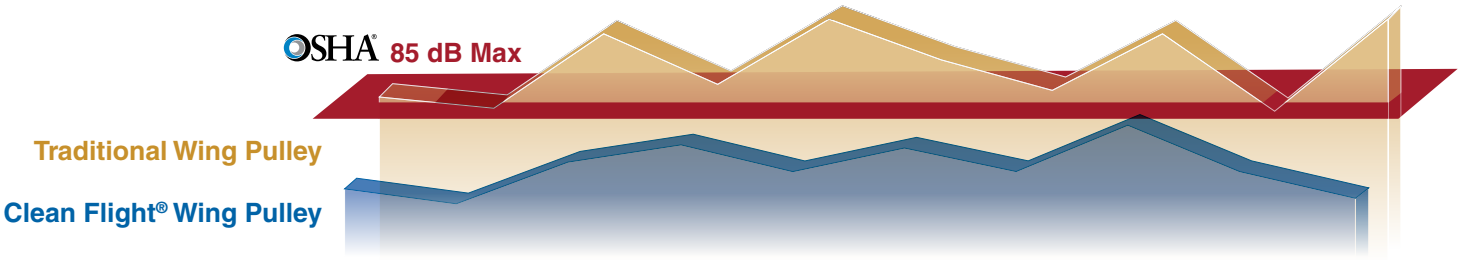


Figure 4. *Noise comparison at 200 FPM between a 16" x 36" traditional wing and Clean Flight® wing (carrying no material)*

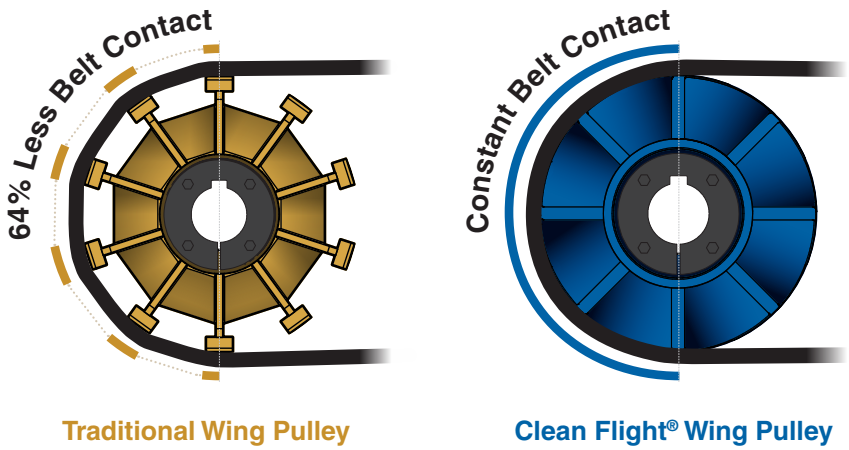


Figure 5. *Belt contact comparison between a 16" x 36" traditional and Clean Flight® wing pulleys*

Easy to order and install

Factory assembly from a single source

Professional factory assembly that is ready to install upon delivery lowers freight costs and allows for consistent quality control; ensuring a fast and safe installation.

- Bearing assemblies
- Take-up frame assemblies
- Keyless lockers for shaft connection
- Various bushing options available

Flexible manufacturing process

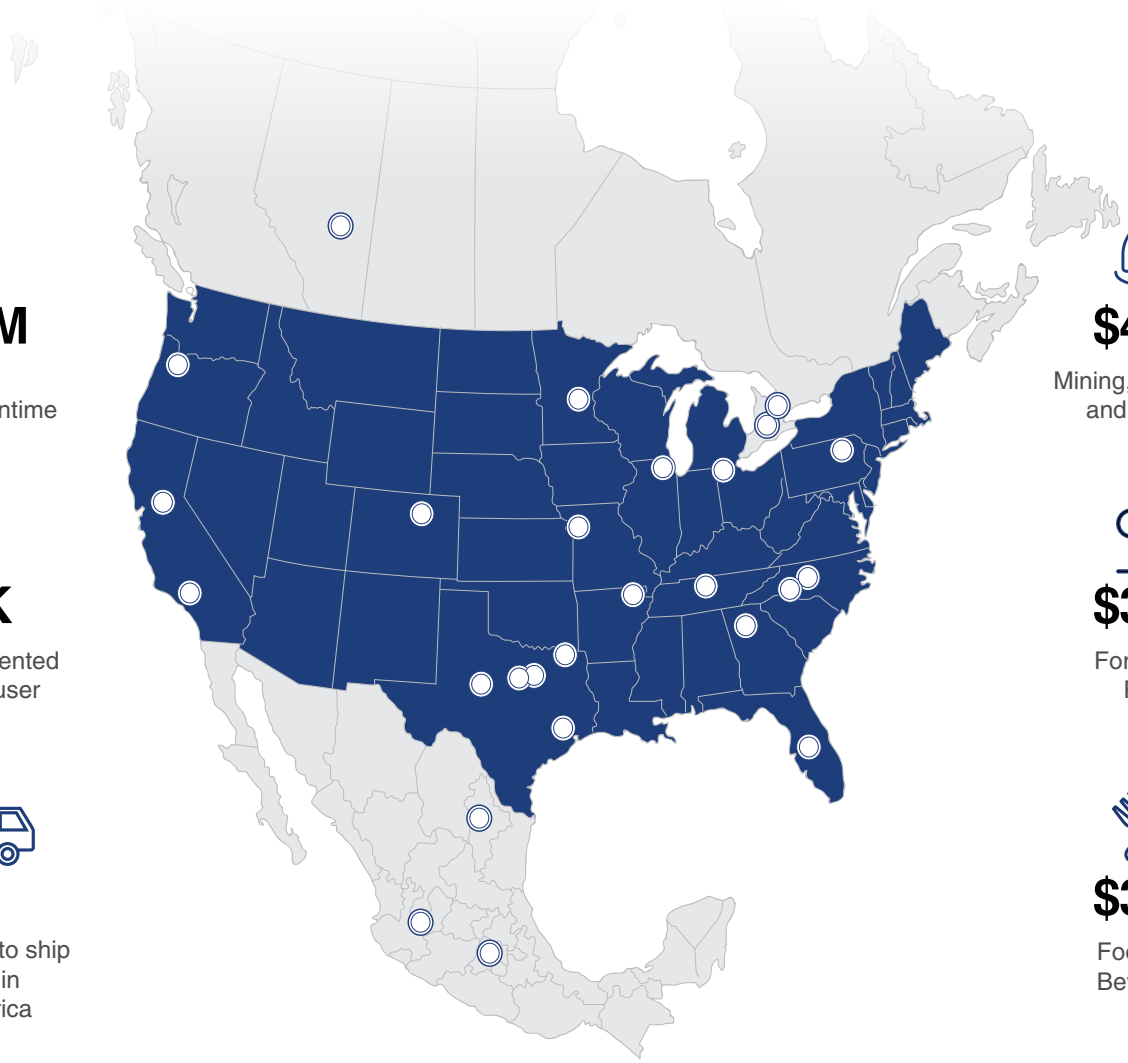
Documented Cost Saving

Easy to order and install

Flexible manufacturing processes

Martin's extensive manufacturing and finished goods inventory footprint throughout North America ensures product is always close to users with the goal of reducing their working capital and lowering freight costs.

In order to maximize user uptime, Martin has a dedicated inside and outside sales team of application and product experts across North America available 24 hours a day, 7 days a week, 365 days a year.



$178M
Annual
Reduced Downtime

$80K
Annual documented savings per user

1.41
Average Days to ship anywhere in North America

$41M
Mining, Aggregate and Cement

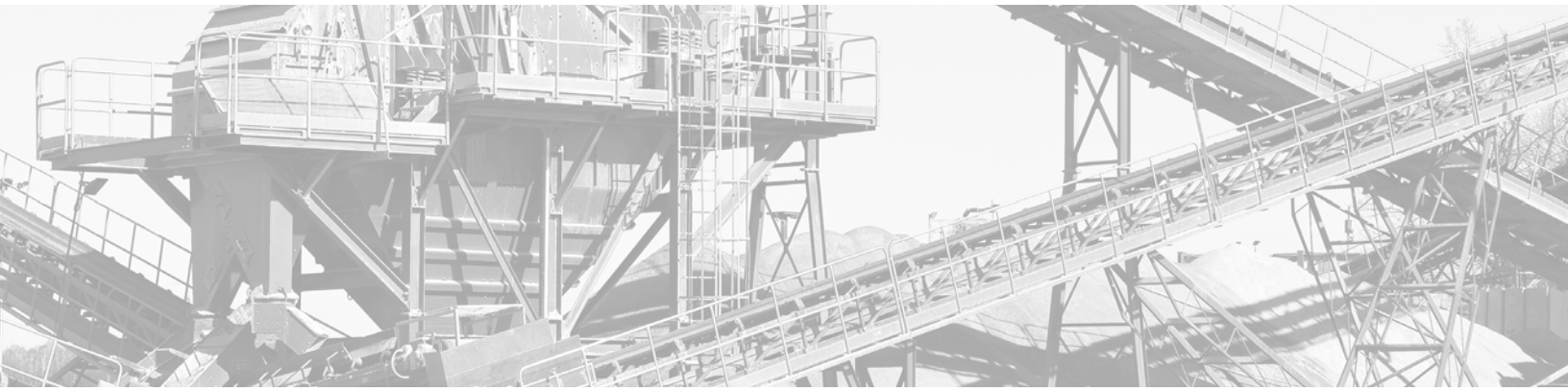
$37M
Forest and Paper

$31M
Food and Beverage

Easy to order and install

Easy identification

Nameplates on every pulley ensures you install the right pulley for your application. The easy nomenclature of the Clean Flight® wing allows users to select the right pulley with common CEMA diameters and face widths for a drop-in replacement to existing tail pulley applications.



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