



SLIP-TORQUE®
ROLLER TECHNOLOGY

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Gentle product handling to keep your production line rolling.

THE SLIP-TORQUE STORY

Pioneered in 1972 by Shuttleworth® founder, Jim Shuttleworth, Slip-Torque® roller technology was developed as a surface for a new kind of conveyor. Designed to feed canning and case packaging machines while allowing natural and rapid loading of individual cans as well as case ready patterns.

As Slip-Torque was shown to be as gentle as it was versatile, this exclusive surface technology became the foundation of Shuttleworth conveyor systems – creating low back-pressure to enable gentle accumulation and transportation of products. Today, the use of Slip-Torque has evolved through an abundance of product applications in various industries from automotive, food & beverage, healthcare, paper, solar energy, electronics and more.

SAFE AND GENTLE

Slip-Torque is not only gentle on products, but also integrated machines and operators working within the production line. The inherent low back-pressure and low friction protects integrated packaging machinery from over feeding. Our patented surface is safe to the touch. Rollers stop when a hand is placed on the surface while our frame designs allow for better ergonomics for operators.



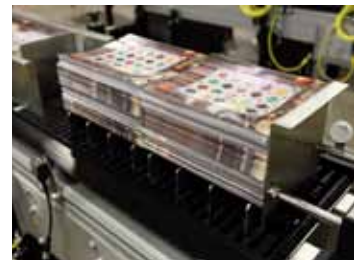
SLIP-TORQUE ALLOWS FOR SAFE INTERACTION WITH OPERATORS



PIE FREEZER DISCHARGE TO BUFFERING PRIOR TO WRAPPER



HEALTHCARE CLEAN PASS THROUGH



ROBOTIC PRESENTATION OF STACKED SIGNATURES



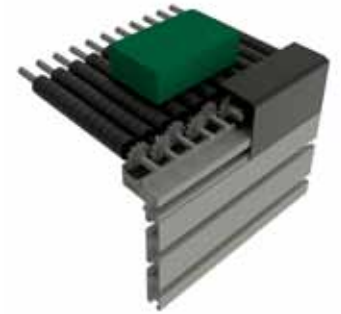
ALUMINUM FRAME DESIGN WITH SLIP-TORQUE ROLLER TECHNOLOGY

TECHNOLOGY

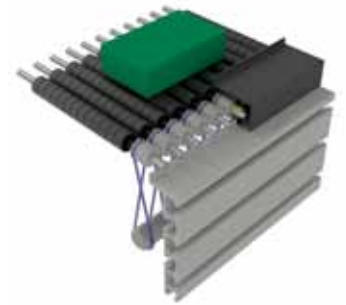
Slip-Torque roller technology uses individually powered roller shafts covered with segmented, loose fit rollers. Power is transmitted to the roller shafts through attached sprockets from a consistent roller chain framework.

The forward driving force is determined by the weight of the product being conveyed and the coefficient of friction between the shafts and the inside diameter of the rollers. As the weight of the conveyed product increases, an increase in the supplied driving force occurs. When products accumulate on the conveyor surface, the segmented rollers underneath stop while the roller shafts continue to "slip" within the inside diameter of the roller. As a result, low back-pressure accumulation is achieved while jamming, scuffing, abrasion and other product damage is avoided.

From low back pressure accumulation within a packaging system to precise product or part positioning for a robot ready solution, Slip-Torque roller technology is proven in over 18,000 installations worldwide.



CHAIN DRIVE SLIP-TORQUE ON ALUMINUM FRAME



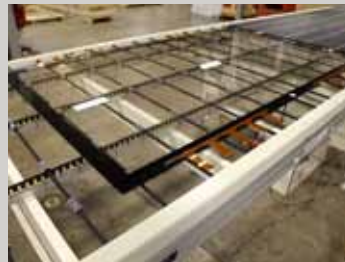
BELT DRIVE SLIP-TORQUE ON ALUMINUM FRAME

Slip-Torque for the Delicate

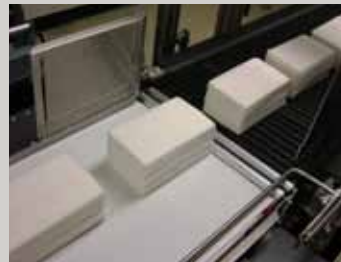
From tapered cups and paper stacks to glass and blister packs, Slip-Torque's gentle handling maintains product integrity.



MASS LOW BACK PRESSURE ACCUMULATION TO SINGLE ROW ON STAINLESS STEEL FRAME



ELECTRONIC GLASS PANEL HANDLING



WET WIPE STACKS INDEXING FOR WRAPPER INFEED



MULTI-LANE ACCUMULATION BLISTER PACKS



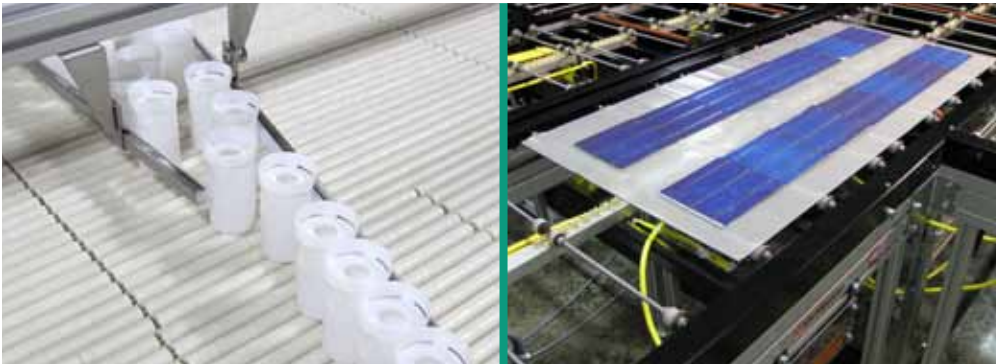
THE SLIP-TORQUE PRINCIPLE WITH STAR ROLLERS PREVENT SHINGLING OF PAPER STACKS



CASE ROTATOR CREATED USING A SLIP-TORQUE SPLIT-SURFACE DESIGN

SURFACE VERSATILITY

Shuttleworth offers over 200 engineered rollers in a variety of diameters and materials to meet your product handling needs. Specialized rollers for high and low friction, conductive, anti-static, food grade, chemical resistant, high temperature and more are available to enable precise, reliable handling, resulting in maximized uptime.



SLIP-TORQUE ALLOWS THE PRECISE AND GENTLE HANDLING OF MOST PRODUCTS RANGING FROM SMALL UNSTABLE TAPERED PRODUCT (LEFT), TO LARGE PANELS FOR SOLAR AND GLASS APPLICATIONS (RIGHT).



FROM A SINGLE MACHINE INFEED (LEFT) TO A FULLY INTEGRATED SYSTEM LINE (RIGHT), SLIP-TORQUE CAN BE USED TO OPTIMIZE A SPECIFIC APPLICATION OR AN ENTIRE PRODUCTION LINE.

Common Roller Sizes



FINE - 17 MM DIAMETER



STANDARD - 21 MM DIAMETER



COARSE - 32 MM DIAMETER



SUPER COARSE 60 MM DIAMETER

Specifications

Slip-Torque solutions are custom-engineered to desired specifications to meet exacting governmental and industrial requirements. Shuttleworth offers Slip-Torque in extruded aluminum and stainless-steel frame configurations for traditional industrial applications through USDA meat and poultry, EU 1935/2004, and Grade A pharmaceutical environments to Class 10 or better cleanroom applications.

Please contact Shuttleworth to help define a suitable solution for your application.

| Drive | Belt | Chain |
|---------------------------------------|------------------------------|-------------------------|
| Max. Speed | 36.6 m/min. (120fpm) | 91.4 m/min. (300fpm) |
| Max. Weight¹ | 79 kg/m (53 lbs/ft) | 119 kg/m (80 lbs/ft) |
| Min. Temperature² | 0° C (32°F) | -40° C (-40°F) |
| Max. Temperature² | 46° C (115°F) | 148° C (300°F) |
| Standard Lengths (Meters) | .5, 1.0, 1.5, 2.0, 2.5, 3.0m | |
| Max. Surface Width³ | up to 1500mm | |

¹Max. Weight varies by shaft pitch and construction components.

²Min. and Max. temperature reflects ambient temperature

³Maximum surface width may vary between frame styles

DESIGN FLEXIBILITY

Custom Devices and Seamless Integration

Slip-Torque roller technology naturally allows for customization and integration. Within a single frame, systems can be designed with options including multi-lane, open center, reversing and bi-directional capabilities.

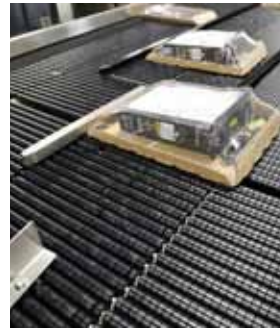
Slip-Torque conveyors can also be integrated with our full complement of custom devices. The inherent design allows for some devices to be built within the conveyor surface, seamlessly integrated without the need for additional drives or conveyors. Devices and surface configuration are determined by the functional requirement of the application.



MULTI-LANE GUIDES



ROTATORS



PUSHERS & DIVERTERS



BI-DIRECTIONAL SURFACE



ROBOT & MACHINE PRESENTATION



PRODUCT STOPS



TIGHT-RADIUS TURNS



CUSTOM SURFACE

Our unique solutions are designed to offer flexibility and gentle product handling to deliver increased efficiency, greater product throughput and reduced product waste – improving your total cost of ownership.

To see our product handling solutions in action, visit Shuttleworth.com



From automotive and electronics, to paper conversion and pharmaceuticals, to food and consumer good markets and beyond, manufacturers across the globe rely on Shuttleworth's proven product handling solutions to increase line efficiency, maximize profitability, and minimize risk. As part of the ProMach Product Handling business line, Shuttleworth helps our packaging customers protect and grow the reputation and trust of their consumers.

ProMach is performance, and the proof is in every package.

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