MOVING AHEAD

www.melcoconveyors.com
Melco Conveyor Equipment is South Africa’s premier supplier of conveyor idlers, structure, and motorized pulleys. Melco is an ISO 9001:2008 rated manufacturer together with SANS 1313 accreditation, with a well established reputation for delivering quality products and providing reliable after sales services.

Melco is a level 3 BBBEE contributor, with black ownership of 25% + 1 vote.

Operating from its factory in Germiston, Gauteng, Melco supplies Southern African as well as world markets.

Melco has been supplying conveyor equipment since 1970. In 2006 Melco became a wholly owned subsidiary of the Rulmeca group of companies, significantly strengthening its existing operations and enhancing its already formidable technical expertise. Rulmeca is the largest supplier of conveyor rollers globally, with manufacturing facilities in Italy, Germany, Canada, Venezuela, Thailand, as well as the UK, China and South Africa.

Conforming to SANS 1313, UNI-DIN, ISO, AFNOR, CEMA and BS standards, the extensive range of Melco products are used in a multitude of sectors, such as mining, cement, steel works, glass, chemicals and the fertiliser industry. Using state-of-the-art techniques in design and manufacturing equipment, Melco products achieve outstanding sustained performance levels in even the harshest of operating conditions.

Melco supplies a large range of superior products and assists clients to optimise conveyor systems and operations.

Melco has a Research and Development laboratory and Engineering department to continually improve product performance and adapt to customer requirements.
Melco manufactures conveyor equipment according to the highest international standards. Our products include steel, HDPE and rubber impact conveyor rollers, idler frames, conveyor structure and motorized pulleys.

- **STEEL ROLLERS**
- **IMPACT SYSTEMS**
- **SUPREME HDPE ROLLERS**
- **UNDERGROUND CONVEYOR STRUCTURE**
- **RUBBER IMPACT ROLLERS**
- **MOTORIZED PULLEYS**
- **IDLER FRAMES**
Melco manufactures conveyor rollers according to SANS 1313 and other international standards, as required. Rollers are optimally designed for cost effective conveyor roller solutions.

Rollers are engineered to give a balance between effective sealing and low roll drag and breakaway mass and are manufactured with accurate bearing alignment.

Total Indicated Runout (TIR) of rollers is according to SANS 1313 and other standards, as are materials used for roller construction.

Rollers are available in a variety of lengths, standard diameters, shell thicknesses and a range of shaft diameters and end fitting arrangements.

STEEL ROLLERS

Typically available in 102 mm, 127 mm, 152 mm and 178 mm diameters as well as other common diameters, on request.

RUBBER IMPACT ROLLERS

Typically available in 133 mm, 159 mm and 178 mm diameters, as well as other common diameters, on request.

DISC ROLLERS

Typically available in 133 mm, 159 mm and 178 mm diameters, as well as other common diameters, on request.

HDPE ROLLERS

Available in 127 mm, 133 mm, 152 mm, 159 mm and 178 mm diameters.
ROLLER DESIGN AND CONSTRUCTION

Melco steel idler rollers are manufactured according to SANS 1313 and other international standards as required. Rollers incorporate a sealed for life bearing and seal assembly that is designed for optimal sealing and lowest possible drag. Rollers are manufactured to SANS 1313 standards which determine size and performance standards. Alternative standards such as CEMA or DIN can also be referenced where required.

Roller design of shell diameter, shaft diameter and bearing specification is determined by the load experienced by the roller to ensure that the shaft deflection at the bearing is within the limits as specified by bearing manufacturers. Rollers can be manufactured in any variety of face lengths with a variety of end shaft designs as per client requirements. The “Turnback” bearing housing ensures that the TIR achieved on these rollers is extremely low.

CONTACTLESS SEALING SYSTEM

For lowest drag and breakaway mass
The seal is a multi-labyrinth system. The contactless design gives an extremely low running resistance. The contactless seal can be paired with an open or sealed bearing, depending on customer requirements.

Ideal for standard conveyors and long overlands where low running resistance is important

HERMETIC SEALING SYSTEM

Optimal drag with superior sealing.
The seal is a multi-labyrinth system with the addition of a lip-style contact seal to provide a positive seal to water and dirt ingress (the hermetic seal can be paired with an open or sealed bearing, depending on customer requirements).

Ideal for conveyors operating in dirty and wet conditions, over short distances, and loading zones

Flinger seals
Rubber flinger seals can be fitted in conjunction with internal sealing systems. These provide an additional barrier in particular cases where high pressure cleaning is unavoidable.

Deep groove ball bearings
Open bearings are fitted as standard. However, ZZ or 2RS bearings can be fitted, on request, in a variety of bearing brands.
Melco’s SUPREME HDPE (High Density Polyethylene) conveyor rollers are designed as an alternative to steel rollers, particularly suited to conveyors operating in dirty, wet and abrasive conditions.

- Standard available in 127 mm, 133 mm, 152 mm, 159 mm and 178 mm diameters
- Non-corrosive HDPE Sleeve
- Lighter than steel roller – improves safety and eases handling
- Stone guard static face – improves safety and sealing ability
- Machined face – excellent TIR gives quieter operation
- Lower electricity usage, particularly on start-up
- Lower noise emission
- Longer roller life, especially in dirty conditions
- Excellent abrasion resistance
- Limits build-up of material on rollers

Supreme V3
In cold and wet conditions the V3 version of the Supreme rollers is advised to prevent ice accumulation inside the seal cavities on intermittent operations. The static face is replaced with a cover cap and a flinger seal is included to ensure optimal sealing.

Size availability
- 127 mm - 25 mm series
- 133 mm - 25 mm series
- 152 mm - 25 mm & 30 mm series
- 159 mm - 25 mm & 30 mm series
- 178 mm - 40 mm series
ANTI-RUNBACK ROLLER

The Melco Anti-runback conveyor roller is a uni-directional roller, fitted with a patented internal device designed to prevent an inclined conveyor from running backwards in the event of a belt break. The contact surfaces of the brake are not load-bearing during normal operation, so there is no additional friction added to the conveyor installation.

- Prevents run-back in the event of belt damage
- Improves safety around inclined conveyors
- Minimises downtime, spillage damage and injury
- Fitted to inside of standard Melco rollers which can be installed on existing idler frames
- Near frictionless operation

The Melco anti-runback roller prevents belt runback but only if fitted to inclined conveyors, in the recommended pattern, in the correct quantity, as a system.

Contact Melco for installation, quantity and pattern required for each conveyor specification.

Can be fitted to both HDPE and steel rollers.

GARLAND ROLLERS

Garland roll assemblies can be manufactured in 2, 3 or 5 roll designs with steel, rubber impact, rubber disc or HDPE rollers in a variety of diameters and lengths. Garlands can be supplied with various end mountings connectors as required.

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ROLLING CATALOGUE

Melco manufactures an extensive range of rollers according to industry standards or customer requirements.

- Roller sizes differ typically in diameter, face length, wall thickness and shaft length.
- This roller catalogue represents common standard rollers in the SANS 1313 range.
- Roll diameter:
  - Common roll diameters for steel and HDPE rolls are 127 mm and 152 mm. Other diameters are also available including 178 mm.
  - Common roll diameters for impact rolls are 133 mm and 159 mm.

COMMON ROLLER SIZES

SANS 1313 notes these face lengths as typical for various common belt sizes.

<table>
<thead>
<tr>
<th>BW</th>
<th>3 Roll</th>
<th>5 Roll</th>
<th>Flat return</th>
<th>V-Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>240</td>
<td>688</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>290</td>
<td>840</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>340</td>
<td>994</td>
<td>475</td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td>390</td>
<td>240</td>
<td>1146</td>
<td>560</td>
</tr>
<tr>
<td>1200</td>
<td>450</td>
<td>270</td>
<td>1298</td>
<td>635</td>
</tr>
<tr>
<td>1350</td>
<td>500</td>
<td>300</td>
<td>1450</td>
<td>720</td>
</tr>
<tr>
<td>1500</td>
<td>560</td>
<td>340</td>
<td>1602</td>
<td>800</td>
</tr>
<tr>
<td>1650</td>
<td>610</td>
<td>370</td>
<td>1754</td>
<td>885</td>
</tr>
<tr>
<td>1800</td>
<td>660</td>
<td>400</td>
<td>1908</td>
<td>965</td>
</tr>
<tr>
<td>2100</td>
<td>765</td>
<td>475</td>
<td>2212</td>
<td>1146</td>
</tr>
</tbody>
</table>

AVAILABILITY TABLE

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Steel</th>
<th>HDPE</th>
<th>Impact/Spool</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>127</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>152</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>165</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>178</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>194</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>215</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
</tbody>
</table>

Shading indicates common sizes.

SHAFT ENDS

- Closed end
- Open end
- Garland end
- Adaptors

Other size combinations are also possible. Contact Melco for your requirements.

*All dimensions are in mm
Melco manufactures a large variety of idler design configurations according to industry standards, such as SANS 1313, DIN or CEMA, or according to unique customer requirements.

Idlers are supplied for a standard range of belt widths from 450 mm to 2400 mm. These are manufactured idlers using primarily tube or angle iron main structural sections. Corrosion protection: items can be galvanised, standard painted, or treated with special coating systems, depending on customer requirements.

Idler frames are designed to accommodate for the operational loading characteristics of the conveyor where the cross member is designed to ensure that the loading and deflection limits are met.

**Common Designs**

- **Troughing idler**: 3 Roll, offset, top mounted, tubular
- **Impact idler**: 3 Roll, offset, underslung, tubular
- **Troughing idler**: 5 Roll, offset, top mounted, tubular
- **Troughing idler**: 3 Roll, inline, top mounted
- **Impact idler**: 3 Roll, offset, top mounted
- **Adjustable idler**: 3 Roll, inline, top mounted
- **Picking idler**: 3 Roll, inline, top mounted
- **V-Return idler**: 2 Roll, inline
- **Troughing training idler**: 3 Roll, inline

The Melco Belt Saver idler frame uses tubular sections with offset mounting brackets below the top of the tube. This provides protection to the belt from tears in the event of a roller coming out of the frame.

Troughing idlers are manufactured according to customer requirement as:
- Offset or inline
- Top mounted (belt line above mounting structure) or underslung (belt line below mounting structure)

Impact frames typically have a more sturdy design to accommodate for impact loads. Idlers are commonly manufactured in a 1, 2, 3 or 5 roll design.
STRUCTURE

Underground modular conveyor structure

A variety of configurations of underground conveyor modules can be manufactured. These modular systems are ideal for rapidly extending or retracting conveyors typical in gold, platinum and coal mines. The modules can be supplied as roof mounted or floor mounted.

Stringers: Tubular or channel sectioned. Module lengths vary typically from 3000 mm to 4500 mm.

Stools: Supplied with extendable legs for adjustment for uneven floor. Can be fitted with flat or v-return brackets.

Idlers: Can be supplied as fixed frame or garland type.

Impact systems

In order to limit belt damage at loading areas, impact beds are used to ensure that the blow from falling material is cushioned when making contact with the belt.

High impact bed – for high impact and larger lump sizes. Linked garland strings are mounted on shock absorbing rubbers.

Slider bed – for low impact and small lump size in a compact design.

Available in a full slider (Skega) or Seal Table design.

RETRACTABLE V-RETURN

The Melco Retractable V-Return idler provides a faster and safer way to replace rollers on V-Return frames on elevated conveyor gantries. The rollers are replaced by sliding part of the frame into the walkway where the rollers can be replaced without the need to lift the conveyor belt or change rollers from the underside of the conveyor. Rollers can be changed by a single person reducing downtime and preventing safety risks of working beneath an elevated conveyor.
Melco has a variety of standard frames for customer requirements, and is able to configure specialised frames in order to meet client requirements of unique applications. Below are noted various options for frame/idler design in order to solve operational challenges or to optimise design.

**Solutions for loading zones**

Changing of conveyor rollers in loading areas and skirted areas is difficult due to the inability to lift the belt sufficiently due to the presence of chutes and skirts. An idler frame is required to simply and safely solve this problem.

The Melco Retractable Idler allows for the replacement of rollers by the splitting of the idler frame into 2 sections which can then be retracted to allow for access to the rollers. The Melco Jack Down Idler allows for the replacement of the rollers by lowering the frame below the belt using 2 standard Bottle Jacks.

**5-Roll Idler configuration**

The 5-roll carry configuration uses rollers that are shorter in length and therefore the required shaft diameter/bearing is less in order to achieve the same design life. The rollers are lighter and cheaper which makes maintenance easier and cheaper and safer for the maintenance personnel. The initial cost of a 5 and 3 roll idler configurations are similar, however when considering the ongoing maintenance costs, the 5 roll system is cheaper to maintain as the centre roll is usually changed more frequently and this is cheaper on the 5 roll system.

It is common to consider a 5-roll configuration for belt widths > 1200 mm Belt Width.

**Unequal roller idlers for overland conveyors**

On a typical idler design, the centre roller carries in excess of 60% of the idler load. By using a shorter roller on the centre roll the shaft series and bearing size can often be reduced as the roller load is lower and the deflection length less. This results in a decreased idler cost. This is most applicable on long overland conveyors where cost efficiency is important. This can be used in combination with a larger diameter roller on the centre roller compared to the wing rollers.

**Tubular Cross Members**

The cross member on idler frames is a critical part of design and a large contributor to the cost of a frame. The load applied to the frame results in stress and deflection which must both be limited according to conveyor design and material standards. Changing the cross member sections from angle iron to tubular usually results in a mass and cost saving while at the same time providing the required rigidity and strength.

**Banked overland conveyor idlers**

Long overland conveyors frequently need to negotiate horizontal curves. In order to ensure that the conveyor is able to follow these curves, banked idlers are often employed on both trough and return side.
RULMECA MOTORIZED PULLEYS

Safe, powerful, compact, quiet and energy efficient

**STATIONARY EXTERNAL SHAFT**
This is safely fastened to the conveyor frame with mounting brackets – no pillow blocks to maintain

**ELECTRIC AC MOTOR**
An efficient VFD compatible squirrel cage design

**OIL PLUG MAGNET**
Metallic grit is captured and the oil break in period is eliminated

**ROTATING DRUM**
This is the external moving part

**OIL DRIP LIP**
This circulates the oil and ensures continuous motor cooling

**GEARBOX**
Motor torque is transferred directly to the rotating drum

**FACTORY OIL-FILLED**
The synthetic oil that is vital for motor cooling and lubrication of the gears and bearings has a 30 000 operating hour life span

**DOUBLE OIL SEALS**
With an IP67 sealing rating, dust or water contamination has been tested to a depth of 1 meter for 30 minutes

**TERMINAL BOX**
Power and control wire is conveniently located in here

**CURRENT PRODUCT RANGE**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>138 mm to 1000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>0.1 kW to 250 kW</td>
</tr>
<tr>
<td>Belt speed</td>
<td>0.04 m/s to 5.5 m/s</td>
</tr>
<tr>
<td>Voltage</td>
<td>115v</td>
</tr>
<tr>
<td>Phase</td>
<td>Single and three phase</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 &amp; 60 Hz – VFD compatible</td>
</tr>
</tbody>
</table>

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# Features and Benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety</strong></td>
<td>With an enclosed gearbox and motor, this is the safest drive available. The only moving external part is the pulley shell.</td>
</tr>
<tr>
<td><strong>Energy Efficiency</strong></td>
<td>The rugged design and exceptional build quality allow for power efficiencies of up to 97%</td>
</tr>
<tr>
<td><strong>Low noise</strong></td>
<td>The hermetically sealed enclosed design with its balanced pulley and high quality components allows for very quiet operations.</td>
</tr>
<tr>
<td><strong>Low cost</strong></td>
<td>Fewer parts means less conveyor design, lower purchase prices and reduced maintenance costs. The motorised pulley is also lighter and weight balanced, allowing for lower conveyor structure costs.</td>
</tr>
<tr>
<td><strong>Low maintenance costs</strong></td>
<td>The Rulmeca Motorised Pulley requires only the recommended oil &amp; oil seal changes; service intervals may be extended by using only uncontaminated synthetic oil.</td>
</tr>
<tr>
<td><strong>Simple installation</strong></td>
<td>Quick and easy to install</td>
</tr>
<tr>
<td><strong>Compact and light</strong></td>
<td>Less design and support structure is required.</td>
</tr>
<tr>
<td><strong>Space Saving</strong></td>
<td>As a self contained unit, it is far more compact than an exposed drive, with no need for costly extras such as chains, V-belts, couplings, bearings, support structures and special guardings.</td>
</tr>
<tr>
<td><strong>Cleanliness</strong></td>
<td>Because it is hermetically sealed, there is no risk of contamination of any conveyed materials or surrounds.</td>
</tr>
<tr>
<td><strong>Aesthetic appearance</strong></td>
<td>Its compact size and smooth lines allow for the motorised pulley to be unobtrusively placed within the conveyor structure.</td>
</tr>
<tr>
<td><strong>Thermal protection</strong></td>
<td>All three phases are protected by a heat sensitive thermal protection switch built into the motor windings to protect it from overheating.</td>
</tr>
<tr>
<td><strong>Soft start and frequency conversion</strong></td>
<td>All Rulmeca motorised pulleys with 3 phase motors are easily controlled using either a soft starter or a variable frequency converter working in the 16 Hz and 66 Hz range.</td>
</tr>
<tr>
<td><strong>Totally enclosed</strong></td>
<td>The motor, gearbox and bearings are all totally enclosed within the steel shell and sealed to IP67 standards, greatly reducing access to harmful substances.</td>
</tr>
</tbody>
</table>

**Quality and testing**

Motorized pulleys are designed and manufactured according to the highest German standards to ensure optimal performance and reliability.

Rulmeca Germany has a testing facility where each design of a Motorized Pulley is tested under full load.

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**Unit handling motorized pulleys**

The Rulmeca Motorized Pulley is ideally suited to unit handling applications in packaging and palletizing, industrial automation, food and beverage processing and warehousing, distribution centres, airport logistics, postal and parcel handling.

Highly compact, completely sealed and maintenance free.

For more information, please go to www.rulmeca.com

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[Image of motorized pulleys and conveyor components]
Melco has a dedicated factory with sophisticated equipment for the production of high quality rollers and frames, in large quantities. Melco is quality listed according to ISO 9001:2008 and SANS 1313.

Advanced machinery enhances quality through improved precision, repeatability and quality control, including online measurements.

Below are some examples of various machines used in conjunction with conventional machines.

**ROLL SHOP**

**Bearing housing press**
800 tonne multistage press to ensure high tolerances of critical dimensions on bearing housings

**Automatic shafting machine**
Single process shafting machine for high precision shaft matching.

**Automatic roller assembly machine**
Single machine to assemble rollers, including bearings and seals. Each roll is tested for TIR, axial float and running resistance.

**REPETITIVE FABRICATION FRAME SHOP**

**Robotic welders**
For large quantities of frames, ensuring quality and repeatable production.

**High definition plasma cutter**
Manufacturing of components to high tolerances.

**Pipe plasma cutter**
Precision cutting to exact specifications.

**Bending machine**
Precision bending of components to the required shapes.
Melco Conveyors has an engineering department that uses CAD modelling to design and verify conveyor components suitability. Using software such as Inventor Solid Edge and AutoCAD, suitable drawings are produced for production and models constructed for integration into conveyor designs.

The Melco Research and Development laboratory is able to test roller construction and operation according to standards. The tests include load testing, breakaway mass and running friction tests.

Melco provides quality products with excellent after-sales service. This includes:

- Conveyor surveys to assess conveyor performance
- Problem solving to assist clients with achieving optimal performance from their conveyors

The Melco School of Belt Conveying is a training program for client personnel, familiarising them with correct operations of conveyor systems, held either at Melco’s custom facility or at the client’s operation.

Melco is aware of the social challenges facing many of its employees, as well as communities in the area where Melco operates. The company has a variety of social development initiatives in order to contribute to uplifting these situations.

These include:

- 8-12 for life : Sponsorship of educating local learners during High School
- Adult Education and Training (AET) : Offered to Melco employees to assist with improved literacy and numeracy
- Crèche and HIV Care Centre in Dukuthole
RULMECA LOCATIONS

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