

# PREMIER SUPPLIER

OF CONVEYOR EQUIPMENT









# MELCO CONVEYOR EQUIPMENT

Melco Conveyor Equipment is a leading manufacturer of high quality conveyor idler rollers and frames, with extensive range of bulk material conveyor idlers for worldwide use in mining, ports and industry.

Founded in South Africa in 1970, Melco became a wholly owned subsidiary of the Rulmeca Group of Companies in 2006, significantly strengthening its existing operations and enhancing its technical expertise.

Rulmeca is the largest global supplier of conveyor rollers, with manufacturing facilities in Italy, Germany, Canada, Thailand, England and China, in addition to Melco in Germiston, Gauteng, South Africa.

Melco is an ISO 9001:2015 rated manufacturer with SANS 1313 accreditation.

Technical standards conform to SANS 1313, UNI-DIN, ISO, ANFOR, CEMA and BS Standards.

Melco is a Level 4 BBBEE contributor with a 51% black ownership.

The Melco Research and Development laboratory is able to test roller construction and performance according to prescribed standards. The tests include load testing, breakaway mass and running friction tests, as well as bearing alignment.

The Melco Engineering Design Department design and verify idlers for operational specifications and provide customized solutions, where required. Suitable engineering drawings are produced for integration into conveyor designs.

Supply contracts are established with operations and Melco provides on site after-sales services to clients. This includes conveyor assessments and proposals for problem solving in addition to appropriate training for optimal conveyor operation.

## **CPM ENGINEERING**

Conveyor Pulley Manufacturers (CPM) makes quality pulleys according to SANS 1669 Parts 1&2 industry standards, and customer specific requirements, as required.

Founded in 1992, CPM supplies pulleys for conveyor projects worldwide. The company was acquired by Melco to enhance its single supply solution.

Motorized Pulley Drum Motors are supplied by Melco, from the Rulmeca factory in Germany, as an efficient, reliable, and low maintenance alternative to conventional drive systems.

In addition to Bulk Material handling idlers, Melco supplies Unit Handling systems for a wide range of sectors, including food, packaging and warehousing.

Contact Melco on +27 11 255 1600 or go to www.melco.co.za















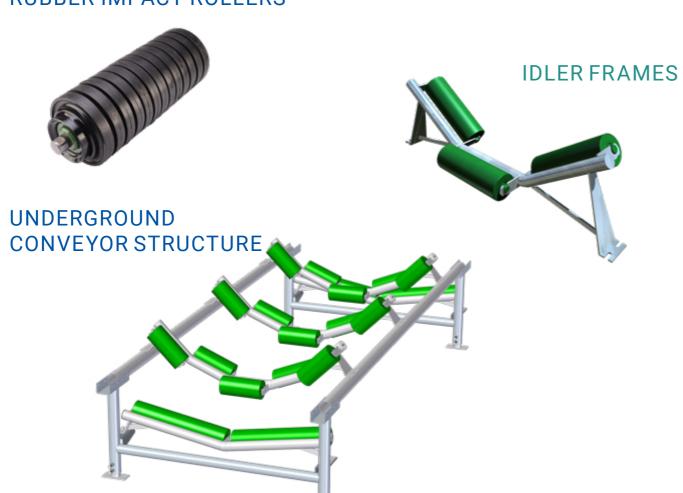


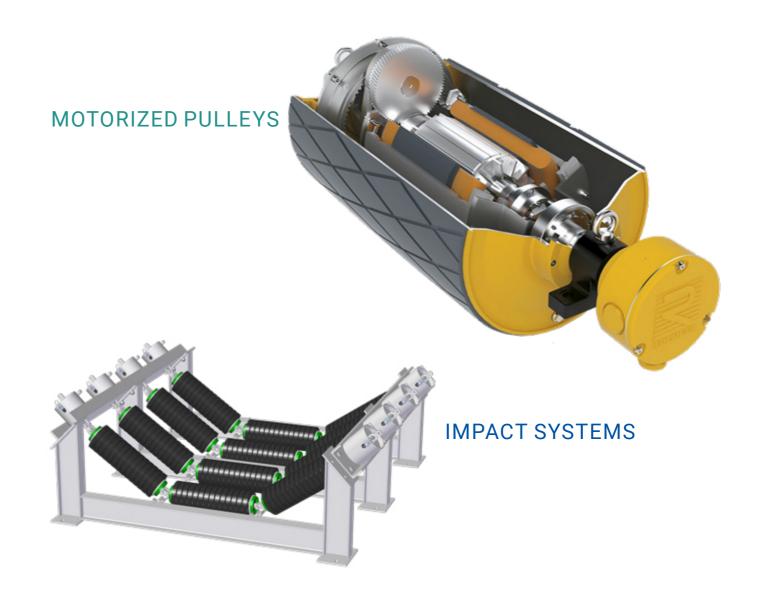
# PRODUCT OVERVIEW

Melco manufactures conveyor equipment according to the highest international standards. Our products include steel, HDPE and rubber impact conveyor rollers, drive and non-drive pulleys, idler frames, conveyor structure and Motorized Pulleys.

## STEEL ROLLERS









# MANUFACTURING CAPABILITIES

Melco operates dedicated factories with sophisticated equipment for the production of high quality idler rollers, idler frames and pulleys in large quantities. The Roller Shop is 3 400m², the Frame Shop is 2 400m², and the CPM facility is 3 302m²

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

Melco is accredited according to ISO 9001:2015.

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

#### **ROLLER SHOP**



**BEARING HOUSING PRESS** 

800 tonne multistage press to ensure high tolerances of critical dimensions on bearing housings.



**SHAFT MACHINING** 

Single process shafting machine for high precision shaft machining.



**ROLLER ASSEMBLY MACHINE** 

Single automatic 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.



PIPE PLASMA CUTTER

Precision cutting to exact specifications.



BENDING MACHINE

Precision bending of components to the required shapes.



## **PULLEY SHOP**



SHELL MACHINING



**ASSEMBLY** 



SHAFT MACHINING



PLATE ROLLING

# **CONVEYOR ROLLERS**

Melco manufactures conveyor idler rollers according to SANS 1313, CEMA, DIN and other international standards, as required. Rollers are optimally designed for cost effective conveyor roller solutions.

Melco manufactured rollers have an excellent bearing alignment and Total Indicated Runout (TIR) achieved by using quality materials for roller construction and quality machinery.

## STEEL ROLLERS

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

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

Additional roller configurations can be supplied through the Rulmeca Group, where required.



## RUBBER IMPACT ROLLERS

Typically available in 133mm, 159mm, 178mm, and 219mm diameters, as well as other common diameters, on request.



## RUBBER DISC ROLLERS

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



# Contract of the second of the

**HDPE ROLLERS** 

Available in 127mm, 133mm, 152mm, 159mm and 178mm diameters.

## **GARLAND IDLERS**

Garland roll assemblies are manufactured in 2, 3 or 5 roll designs with steel, HDPE, rubber impact, or disc rollers, in a variety of diameters and lengths supplied with a range of mounting connectors, as required.



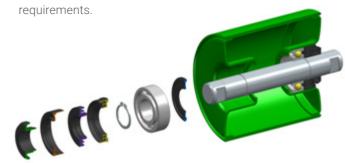
## ROLLER DESIGN AND CONSTRUCTION

Melco idler rollers are manufactured according to SANS1313, CEMA, DIN or other international standards, as required.

Melco rollers incorporate a bearing and seal assembly that is designed for optimal sealing and lowest possible drag.

Roller design of shell diameter, shaft diameter and bearing specification is determined by the operational conditions of the conveyor as loading onto the roller. Designs factor in shaft deflection limits at the bearing and bearing life as specified by bearing manufacturers.

Melco uses a "Turnback" bearing housing, ensuring accurate bearing alignment and superior Total Indicated Runout (TIR). Rollers can be manufactured in any variety of face lengths with a variety of end shaft designs, as per client requirements.

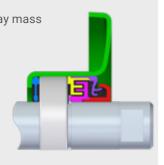


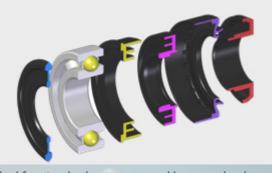
## **SEALING SYSTEMS**

### CONTACTLESS

For lowest drag and breakaway mass

The multi-labyrinth contactless sealing design gives an extremely low running resistance. The contactless seal can be paired with an open or sealed bearing, depending on customer requirements and operational conditions.



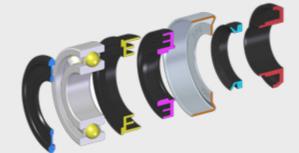


Ideal for standard conveyors and long overlands where low running resistance is important

## **HERMETIC**

Optimal drag with superior sealing.

The multi-labyrinth hermetic sealing design has an additional lip-style contact seal to provide a positive seal against water and dirt ingress. The hermetic seal can be paired with an open or sealed bearing, depending on customer requirements and operational conditions.







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.
Sealed bearings (ZZ or 2RS) can be fitted on request in a variety of bearing brands.
Spherical roller bearings can be specified where required

## FIRE RETARDANT ANTI STATIC SEALS

Melco has developed a standardised seal cartridge that complies with the highest possible fire retardant (FR) and antistatic (AS) ratings. FRAS seal cartridges can be fitted to both steel and HDPE rollers, depending on customer requirements.

Rollers fitted with FRAS seal cartridges are sought after by companies operating conveyors in fiery conditions or underground environments such as coal mines.

#### FIRE-RESISTANT

The standardised seal cartridge comprises individual polymer components using UL94-VØ rated materials.

#### ANTI-STATIC

Anti-static materials are materials that inhibit triboelectric charging which is the buildup of an electric charge by the rubbing or contact with other materials. Melco FRAS seals are manufactured using plastics with a specific surface resistivity of 1Ø9 to 1Ø12 Ohms-per-square and are considered to be anti-static.



The following seal sizes are available in FRAS execution:

SIZE	CONTACTLESS	HERMETIC
6205 - 25 series 52 bore	Υ	Υ
6305 - 25 series 62 bore	Υ	Υ
6306 - 30 series 72 bore	Υ	Υ
6308 - 40 series 90 bore	Υ	Υ





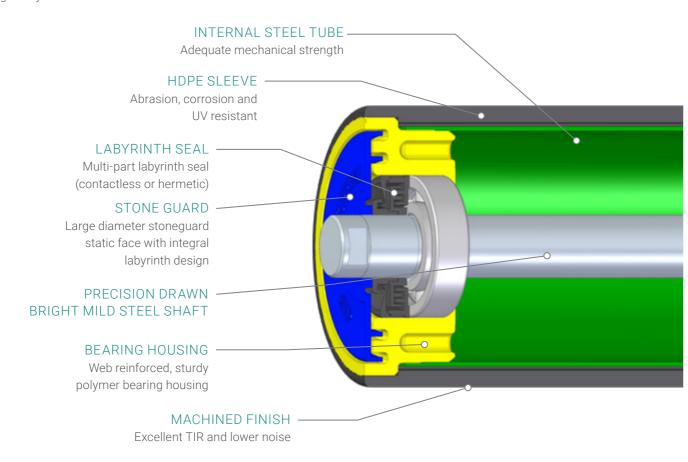


## SUPREME HDPE ROLLERS

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 127mm, 133mm, 152mm, 159mm and 178mm 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

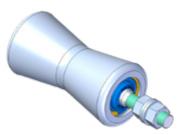


#### **SIZE AVAILABILITY**

- Ø127mm 25mm series
- Ø133mm 25mm series
- Ø152mm 25mm ,30mm & 40mm series
- Ø159mm 25mm & 30mm series
- Ø178mm 40mm series

## FINGER GUIDE ROLLERS

A range of finger guide rollers are available.



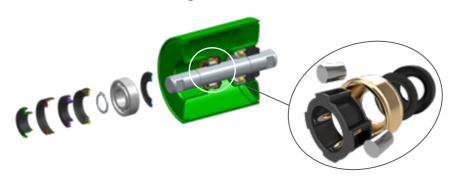
## ANTI-RUNBACK ROLLER

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 of inclined conveyors if fitted with the correct quantity and in the recommended pattern.

Melco will advise on the quantity of anti-runback rollers and the advised installation pattern, based on operational conditions.



#### **HOW IT WORKS**

The internal mechanism consists of 4 needle rollers running in an internal cam. When the roller is running in the direction of normal belt operation, the needles inside the cam are disengaged.

When a belt snaps, the rollers begin to turn in the reverse direction, forcing the needles into the wedge caused between the cam and the shaft, effectively locking the roll. The friction between the roller and the belt will then stop the belt.



When running in forward direction - mechanism disengaged



Reverse motion results in locking













## ROLLER CATALOGUE

An Idler Catalogue is available at www.melco.co.za for SANS1313 and CEMA Idlers.

Melco manufactures an extensive range of rollers according to industry standards or specific customer requirements. Roller sizes differ typically in diameter, face length, wall thickness and shaft length.

Rollers are available as steel, HDPE, rubber impact and rubber the conveyor. disc, as well as rubber and polyurethane lagged.

Weigh class rollers also available as machined and dynamically balanced.

Melco's engineering department conducts design verification on roller design, and advises whether shaft series and bearing specifications are suitable for the operating parameters of

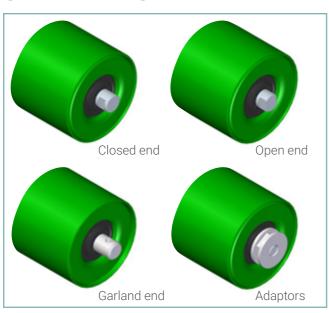
## **COMMON ROLLER SIZES**

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

CONTINUE DEIL SIZES.					
BW	3 Roll	5 Roll	Flat return	V-Return	
600	240		688	300	
750	290		840	400	
900	340		994	475	
1050	390	240	1146	560	
1200	450	270	1298	635	
1350	500	300	1450	720	
1500	560	340	1602	800	
1650	610	370	1754	885	
1800	660	400	1908	965	
2100	765	475	2212	1146	

Dimensions are in millimeters

## SHAFT ENDS



## **AVAILABILITY TABLE**

Diameter	Steel	HDPE	Impact/Spool
60	Υ		
89	Υ		
102	Υ		
114	Υ		
127	Υ	Υ	
133	Υ	Υ	Υ
152	Υ	Υ	
159	Υ	Υ	Υ
165	Υ		
178	Υ	Υ	Υ
194	Υ		
215			Υ

Shading indicates common sizes.

	Series ty	ypica	lly ava	ailable	е	
Roll	Diameter	25	30	35	40	50
Steel	127	Υ	Υ			
Steel	152	Υ	Υ	Υ	Υ	
Steel	178		Υ	Υ	Υ	Υ
HDPE	127	Υ				
HDPE	152	Υ	Υ		Υ	
HDPE	178				Υ	
Impact	133	Υ	Υ			
Impact	159	Υ	Υ	Υ	Υ	
Impact	178		Υ	Υ	Υ	
Impact	219					Υ

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

\*All dimensions are in mm

Standard	steel ro	ller wal	l thicknes	sses
Diameter	3,8	4	4,5	6
127	Υ		Υ	Υ
152		Υ	Υ	Υ
178				Υ

# IDLER FRAMES AND STRUCTURE

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 450mm to 2400mm. These are manufactured idlers using primarily tube or angle iron structural sections.

Corrosion protection: Frame 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.

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 being dislodged from the frame.

Troughing idlers are manufactured according to customer requirement as either:

Offset or inline

Troughing idler: 3 Roll,

offset, underslung, tubular

• 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.



Picking idler: 3 Roll,

inline, top mounted















A catalogue for SANS1313 and CEMA idlers is available at www.melco.co.za









## **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 3000mm to 4500mm.

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

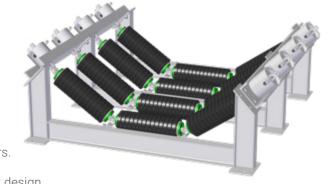


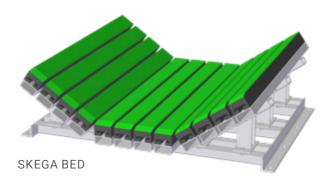
## LOADING ZONE SOLUTIONS

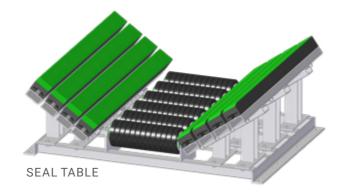
In order to limit belt damage at loading areas, impact beds are used to ensure that the impact from falling material is cushioned when making contact with the belt.

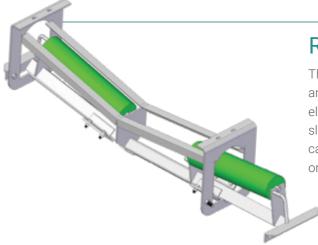
High Impact bed: For high impact and larger object sizes. Linked garland strings are mounted on shock absorbing rubbers.

Slider bed: For low impact and small object sizes, in a compact design.







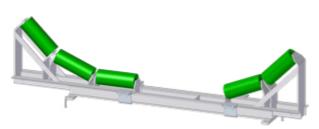


## RETRACTABLE V-RETURN

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.

## **DESIGN SOLUTIONS**

Melco engineers and manufactures a variety of idler solutions and configurations in order to meet specific design requirements. Melco offers the following solutions:



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 smaller, thereby achieving the same design life. The rollers are therefore lighter and cost less, making maintenance easier, reducing costs, and improving safety for maintenance personnel. The initial cost of 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 costs less on the 5 roll system. It is common to consider a 5-roll configuration for belt widths > 1200mm belt width.



#### UNEOUAL 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 decreased idler costs, especially applicable on long overland conveyors where cost efficiency is vital. 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 the 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.



# **PULLEYS**



CPM manufactures a large range of standard and nonstandard pulleys in a dedicated factory according to SANS 1669 and all international standards. Pulleys are designed using customer or industry standards using the provided operational loading information for the conveyor design. The critical design aspects, such as drum diameter, shaft diameter and bearings specification are determined. Detailed loading and stress designs are performed to determine shell thickness, shaft design and end hub type.

The repair of pulleys as well as re-lagging back to design specifications is also offered.



#### TURBINE

A pulley design that uses the 06 type locking element which connects the shaft to the drum without the use of a hub, eliminating the weld in the high stress zone of the pulley. This makes the removal and replacement of the shaft possible, an option not available in solid boss or hub type pulleys.

The design is in line with light to medium size pulleys up to a 200 diameter shaft, depending on user specifications. The end disc is shaped to allow for pressures and defection through the drum and shaft, reducing the stresses in the weld zone of the disc to drum weld.



### T-BOTTOM

A heavy-duty range design common with all shafts over 200 diameter which utilise the 15 type locking element. The end discs are solid and profiled to obtain an even stress distribution imposed on the pulley while in operation.

This type of pulley features the end disc welded off the disc to the rim. The weld area has been relocated to the drum/rim, resulting in lower alternating fatigue stresses on the weld. The 15 type locking elements used are capable of handling larger tensions, especially drive torque on drive pulleys.



#### **LAGGING**

Numerous lagging types are available, as required by the application. Lagging is supplied according to SANS 1669 Part 2 and all international standards.







## GREASE FILLED/ STATIC SHAFT PULLEY



Grease & oil-filled conveyor pulleys are designed and manufactured to exacting specifications and customer preferences. These pulleys are used in specialised situations and conditions. Sizes vary from a 50mm shaft/bearing up to the largest made with a 400mm shaft (between bearings)/360mm diameter bearing. These units are proven and are exported all over the world.

#### **BELT FILTER PULLEY**

Belt filter pulleys were historically large and heavy. The L-Bottom end disc, locking element and stub shaft, make for a large pulley that is light weight.

## **SELF-CLEANING PULLEYS**

A full range of "self-cleaning and self-tracking conveyor pulleys are manufactured, which take the form of Slatted, Cone Slatted, Wing, Spiral and Belt beating pulleys. This are specialised pulleys and should be selected carefully.





## GUIDE / HOLD DOWN PULLEY



## MANUFACTURING CAPACITY

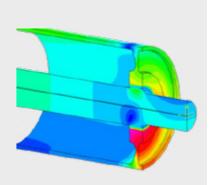
Shell sizes

Up to 3000mm long face width Up to 1800mm diameter Max shell thickness 60mm

Shaft Sizes
Max Length 5000mm
Max diameter 500mm



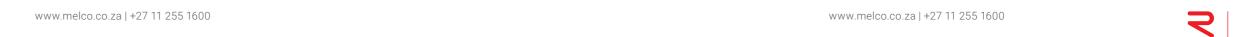
Designs of pulleys can be verified using Finite Element Analysis (FEA).







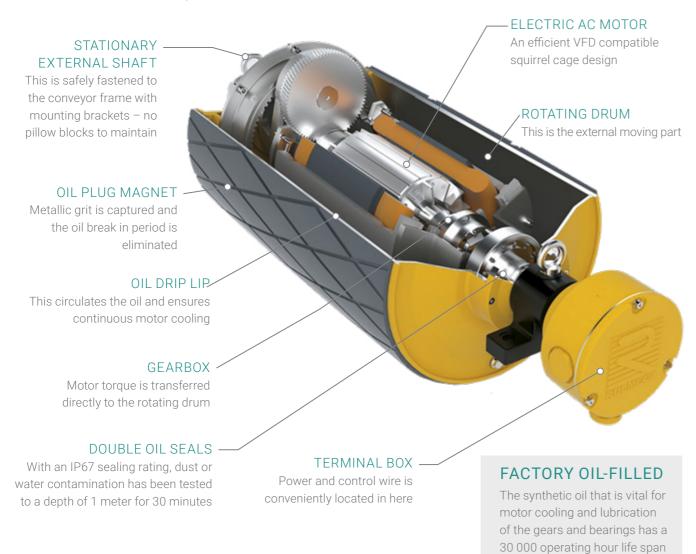




# RULMECA MOTORIZED PULLEYS

The Rulmeca Motorized Pulley was first produced in 1953 specifically for use on conveyors belt applications. A Motorized Pulley is a drum motor or canned drive where the motor and gearbox reducer are contained within the drive pulley. Compact, hermetically sealed, and highly efficient, the Rulmeca Motorized Pulley is a conveyor drive unit that is unaffected by dust, water, oil, grease or other harmful substances. Quick and easy to install, and requiring virtually no maintenance, the Motorized Pulley and can be fitted with a back-stop for inclined conveyors.

60 years of experience enables the Rulmeca Motorized Pulley to be one of the most reliable, effective and safe conveyor drive systems available worldwide, in applications covering all fields of mining and bulk handling material processing. Rulmeca Motorized Pulleys are supplied with IP66/67 rated protection and comply with the safety standards ANSI 535.4 and ISO 3864-2. They are manufactured according to the Council Directives of the European Communities, particularly according to Directive 2006/95/EC, relating to electrical equipment, and according to Directive 2004/108/EC, relating to electrical magnetic compatibility.



#### **CURRENT PRODUCT RANGE**

 Diameter
 138mm to 1000mm
 Voltage
 115v | 220v | 380 | 400v | 460 | 525v | 1000v

Power 0.1 kW to 250 kW Phase Single and three phase

Belt speed 0.04 m/s to 5.5 m/s Frequency 50 & 60 Hz - VFD compatible

## FEATURES AND BENEFITS

Safety	The enclosed gearbox and motor provides the safest drive available with the pulley shell as the only moving external part.
Energy efficiency	The rugged design and exceptional build quality allow for power efficiencies of up to 97%
Low noise	The balanced pulley and high quality components make for very quiet operations.
Low cost	Fewer parts means less conveyor design and lower purchase price. The motorised pulley is also lighter and weight balanced, allowing for less conveyor structure costs.
Low maintenance costs	Maintenance on the Rulmeca Motorised Pulley requires only recommended oil & oil-seal changes. Service intervals may be extended by using only uncontaminated synthetic oil.
Simple installation	Quick and easy to install with no need for additional alignment.
Space saving	The self contained unit is far more compact than an exposed drive, with no need for external gearbox reducers, V-belts, couplings, bearings, support structures or special guards.
Cleanliness	The hermetically sealed design eliminates the risk of contamination of any conveyed materials or surrounds.
Aesthetic appearance	The compact size and smooth lines allow for the motorised pulley to be unobtrusively placed within the conveyor structure.
Thermal protection	Electrical phases are protected by heat-sensitive thermal protection switches built into the motor windings to protect from overheating.
Soft start and frequency conversion	Rulmeca motorised pulleys with 3 phase motors can be controlled using either a soft starter or a variable frequency convertor working in the 16 Hz and 66 Hz range.

#### **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.

Motorized Pulleys can be serviced and assembled locally.

# DUST EXPLOSION PROOF ON SELECTED MOTORIZED PULLEYS

ATEX 95 - Zone 22 - for applications handling of dusty

grain etc. According to European Directive 94/9/EC.

Rulmeca has developed the first motorized pulley designed and certified with flame proof enclosure "d". This type of motorized pulley was especially designed for underground coal mine conveyors and for any other environment with hazardous dust and gas exposure which need ATEX approval. This conveyor drive has been developed, proven, and certified according to the ATEX European Directive 94/9/ EC, Annex III, by the authorized laboratory "IBExU Institute für Sicherheitstechnik GmbH". Compliance with the Essential Health and Safety Requirements has been assured by the adoption of EN 60079-0:2012 + EN 600 60079-1:2007.









# **LOCATIONS**





AUSTRALIA | BRAZIL | CANADA | CHILE | CHINA | DENMARK / SWEDEN | FINLAND | FRANCE | GERMANY | INDIA | INDONESIA | ITALY | PERU | POLAND | SOUTH AFRICA | SPAIN / PORTUGAL | THAILAND | TURKEY | UNITED KINGDOM | USA







## **CONTACT DETAILS**

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