

Belt Systems & Belt Products





Advanced Technology Solutions

Caterpillar offers a full range of rugged belt conveyor systems and products unsurpassed in performance and service life – custom-designed solutions to handle the most demanding bulk-material handling applications, both on the surface and underground.

Belt Terminal Groups

Caterpillar offers two types of belt terminal groups – pre-engineered and engineered.

Pre-engineered Belt Terminal Groups

Cat® pre-engineered belt terminal systems are designed to be mobile, modular and flexible. Pre-engineered belt terminal groups are easy to move in the mine and use in different areas, reduce lead times, and can be used in multiple applications.

Engineered Belt Terminal Groups

Cat engineered belt terminal systems are designed for more robust applications with very specific customer requirements in mind, and are designed as a joint effort between Caterpillar® engineers and our customer.



Engineered Parallel Drive

Drives

Cat® pre-engineered drives are designed for ease of setup, installation and transportation in and around the mine.

Engineered drives are designed based upon customer-driven parameters and requirements and ensure the right fit for customer applications.

Pre-engineered Drive Solutions

Combo Drive

- Discharge, take-up, snub and drive pulley
- Drive and take-up is all on one base (with heavy-duty welded take-up cylinder)
- Attached boom with ratchet jacks
- Standard take-up carriage travel
- Standard HP hydraulic power pack
- Perfect for short panel runs up to an average of 1,500 ft (450 m)

Alignment-free Drive

- Drive pulleys with MSHA diamond lagging
- Power modules mounted in transport sleds
- Ridged flange low-speed couplings with guarding
- Heavy-duty primary belt cleaner assembly
- Complete lantern assemblies

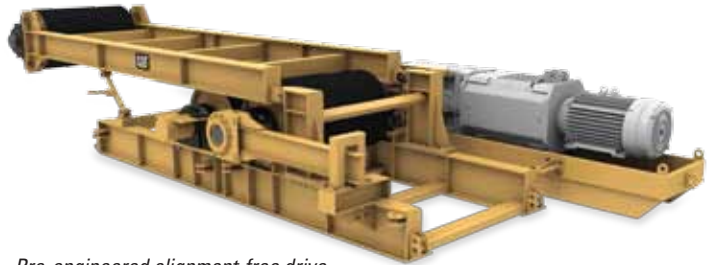
Engineered Drive Solutions

Engineered Drives - Parallel & Alignment-free

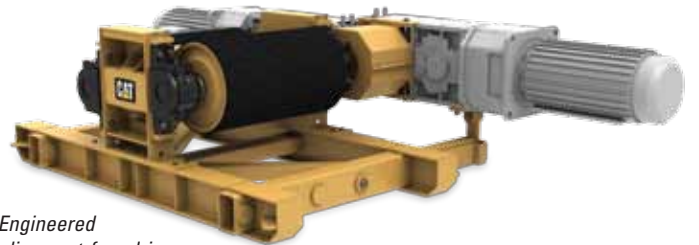
- Starting technologies include mechanical or electrical soft starts
- Parallel or alignment-free
- Benefits of alignment-free drives
 - Ease of setup and installation
 - Ease of transportation in and around mine
 - Narrower overall drive width
 - Universal mounting (left- or right-hand mounting)
 - Reduced operating maintenance
 - Fluid Couplings or Variable Frequency Drive (VFD) design option
- Engineered class pulleys



Pre-engineered combo drive



Pre-engineered alignment-free drive



Engineered alignment-free drive



Engineered parallel drive

Hydraulic Take-Ups & Storage Units

Take-ups and storage units apply slack removal and responsive belt tension for all bulk-material handling conveyor systems.

Pre-engineered Take-Up Systems

- Heavy-duty two-piece frame
- Drum pulleys with MSHA lagging
- 20 or 30 ft (6 to 9) of moving carriage travel
- Solid diameter sheaves with brass bushings, pins and grease fittings
- Non-rotating wire rope and hardware
- Hold-up roller assembly
- Heavy-duty welded hydraulic cylinder

Engineered Take-Up Systems & Belt Storage Units

- Hydraulic or electric winch design and hydraulic cylinder designs
- Active travel length/belt storage per design requirements
- Each take-up has a tension-specific, engineered class pulley which is designed for the max force each cylinder or winch can provide and helps eliminate any weak links in the entire take-up system

Remote Discharges

Designed for in-line 30-, 60- or 90-degree transfer points and efficiently transfers material to the conveyor belt.

Pre-engineered Remote Discharge Systems

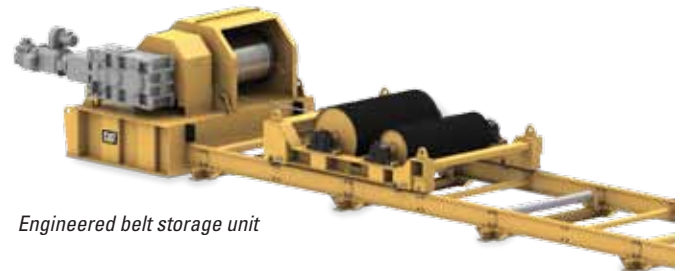
- Heavy-duty welded base frame
- Discharge pulley with MSHA lagging
- Designed with either fixed or adjustable boom

Engineered Remote Discharge Systems

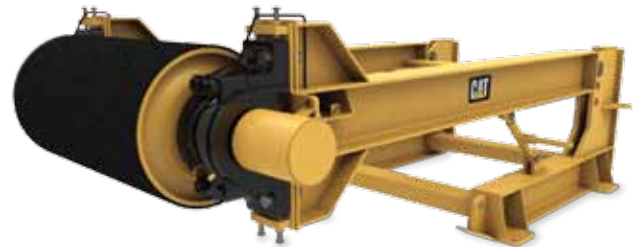
- Available in floor-mounted or roof-hung configurations
- Remote A-frame design
- Attached boom design with ratchet jacks
- Include engineered class pulley – snub pulley available, integrated tail pulley available on the A-frame design



Pre-engineered take-up



Engineered belt storage unit



Pre-engineered remote discharge



Engineered remote discharge

Tail Sections

Cat tail sections are designed to accept loading from a variety of haulage equipment and other belt conveyors.

Pre-engineered Tail Sections

- Lubrication manifold both sides
- Removable panel guarding
- Return v-plow or side plow
- Spiral-tail pulley
- Moon slider in impact area
- Heavy-duty sloped or flat frame

Engineered Tail Sections

- In-line and offset designs
- Intermediate and tail-loading sections offer either impact-resistant idlers or EXALON® impact slider beds
- Rigid heavy-duty engineered loading frame

Engineered Class Pulleys

Cat pulleys are designed to meet specific belt conveyor power and tension needs. Caterpillar offers two types of pulley designs – Turbo Disc and T-bottom.

Turbo-Disc & T-Bottom

- Profile end-discs machined from solid steel plates
 - Eliminates welds in high stress concentration areas
- Keyless locking elements
 - Eliminate unfavorable hub-to-disc-welds
 - Eliminates bellows stress in the end-disc
- Static balancing
- Proprietary welding techniques – complete penetration
 - One bevel groove versus three circumferential fillet welds

Advantages to Cat® Pulleys

- Full motor HP & full take-up force in pulley design
- Machining rims to yield maximum pulley concentricity
- Static balancing
- Single, full-penetration weld to connect end-disc – results in fewer stress concentration points for possible failure



Pre-engineered tail section



Engineered intermediate loading section



Engineered class pulleys



Underground & Surface Belt Structure & Rolls

Roll Design Elements

- Bearing Geometry
 - Modified Geometry bearings allow for greater misalignment
 - End cap bearing housing is designed for strength and close fit to the deflector cap
- Triple Testing
 - Automated assembly process includes the measurement of total indicated run out (TIR), torque or roll drag, and axial end play
- Electronic Quality Tracking
 - Every shaft end is coded with day of year, production year, individual serial number
 - Automatic data recording of triple testing measurements for each roller manufactured
- Replacement Roll Compatibility- Retroloc
 - Adaptor nuts that are mounted onto Caterpillar standard ISO closed slotted ends and pinned in place for complete retrofitting and replacement capability
- Idler PAL™
 - Bearing cavity design allows for extra lubricant capacity (unmatched in the industry) and assures that grease stays in the bearing
 - Grease moves due to taper of rolling elements in the bearing
 - Grease expands due to increased bearing temperatures in operation
 - The compensator disc moves outward, compressing the wave spring
 - When rotation stops and grease contracts, the wave spring exerts slight pressure on the compensator disc, ensuring there are no voids in the grease



"Greased for Life": the Idler PAL™ self-lubricating system



For example, this roll was assembled on the 85th day of 2005 and it was the 35th roll assembled that day.

EXALON® Rolls (2nd Generation)

- Cat EXALON® rolls can extend belt life while reducing operating costs
- High abrasion-resistant formulation
- Decrease belt damage – do not expose steel cutting edges to damage belting
- Light weight – 20-30% lighter
- Sound dampening – up to 20% reduction in noise levels
- Non-adhesive properties mean they are resistant to material buildup, good for wet conditions



Underground Belt Structure Configurations

- Roof-hung – no special tools required for setup and has Cat handle and pin connections or Caterpillar patented EZEE-LOC™ for fast installation
- Floor-mounted – handle and pin connections or EZEE-LOC™ with return rolls mounted in drop brackets attached to channel rails
- Wire-rope – carrying idlers with mounting feet cradle the wire rope until securely fasted with supplied hardware

CEMA C, D, & E Structure

- C&D – roll diameters of 4, 5 and 6 in (89, 108, 133, 159 mm) (Load Capacity, 30,000 – 60,000 hrs.)
- E – diameters of 6 and 7 in (Load Capacity, 60,000 hrs.)
- Underground Designs
 - Offset carrying idlers
 - Single-tube cross-member or box frame
 - Belt width capacity ranges from 18 to 96 in (159, 180 mm)
- Surface Designs
 - Inline carrying idlers
 - Regulated by CEMA (Conveyor Equipment Manufacturers Association)
 - Belt width capacity ranges from 18 to 96 in

Flex PAL™

Cat Flex PAL™ belt structures are available in CEMA C & D class ratings for belt widths ranging from 30 to 60 in (750 to 1 500 mm) with 4, 5 and 6 in (450 to 2 400 mm) diameter rolls.

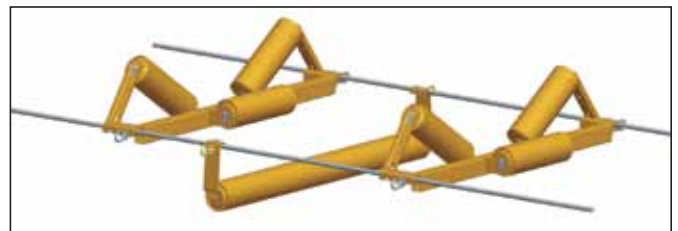
- Retrofit design allows for seamless integration into major competitive existing underground structure setups
- Unique idler design – each idler structure consists of two steel rolls and one center EXALON® roll
- What makes center roll design special – EXALON®
 - The center roll of an idler structure gets the most wear/needs replaced more often than the outer two rolls
 - The EXALON® roll can extend the shell life of a steel roll by two to three times
 - EXALON® also offers other benefits, such as decreased belt damage, lighter weight, sound dampening and resistance to material buildup



Roof-hung structure



Floor-mounted structure



Wire-rope Structure



Flex PAL™ offset idler

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For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at mining.cat.com and www.cat.com

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