

MODULAR PLASTIC CONVEYOR BELT ENGINEERING MANUAL

Comprehensive engineering reference for modular plastic conveyor belts — selection, design, installation, and troubleshooting.

1. Belt Selection Criteria

Primary Selection Factors

Product being conveyed	Weight, shape, temperature, surface characteristics
Environment	Temperature range, chemical exposure, washdown requirements
Conveyor type	Straight, incline, decline, curve, spiral
Speed	Linear belt speed (ft/min or m/min)
Load per unit area	Weight distributed on belt surface
Belt width required	Product width + 50mm minimum clearance each side
Sprocket engagement	Match sprocket to belt pitch and pattern

2. Belt Materials

MATERIAL	MAX TEMP	CHEMICAL RESISTANCE	BEST FOR
POM (Acetal)	90°C / 194°F	Good (not acids)	General purpose, food
PP (Polypropylene)	80°C / 176°F	Excellent	Chemical, high humidity
PE (Polyethylene)	65°C / 149°F	Very Good	Low temp, cryogenic
PEEK	250°C / 482°F	Excellent	High temp, specialty
Nylon (PA)	120°C / 248°F	Good	Heavy load, high temp
PBT	120°C / 248°F	Good	High temp, wear resistant

3. Belt Styles

STYLE	SURFACE	APPLICATION
Flat Top	Smooth flat surface	General purpose, packaging
Perforated Flat Top	Drainage holes	Cooling, washing, dewatering
Raised Rib	Longitudinal ribs	Wet environments, drainage
Friction Top	Rubber insert	Incline, product grip
Open Grid	Large open area	Cooling, air circulation, large product
Flat Top with flights	Vertical flights	Incline conveying, product separation

4. Sprocket Selection

FACTOR	GUIDELINE
Min teeth	8 teeth minimum for standard belts
Preferred teeth	12+ teeth for smooth engagement
High speed	15+ teeth recommended
Material	HDPE or UHMW for polymer belts, steel for heavy duty
Shaft	Keyed or hex, matched to sprocket bore

5. Installation

1. Install sprockets on drive shaft — align teeth across width
2. Install idler sprockets on tail shaft
3. Thread belt onto sprockets — engage all rows of teeth
4. Connect belt ends using connecting rod or snap-fit
5. Set initial tension — belt should be snug, not taut
6. Check tracking — adjust sprocket alignment if belt walks
7. Run unloaded for 15 minutes — verify smooth operation
8. Install wear strips — positioned to support belt between sprockets

6. Troubleshooting

PROBLEM	LIKELY CAUSE	SOLUTION
Belt tracking to one side	Sprocket misalignment	Re-align sprockets, check shaft parallelism
Belt jumping teeth	Excessive tension, worn sprockets	Reduce tension, replace sprockets
Premature wear	Wrong material, abrasive product, high temp	Select correct material, install scraper
Belt breakage	Overload, impact damage	Reduce load, install impact zone support
Product slippage	Wrong surface type	Switch to friction top or raised rib
Hinge pin wear	Inadequate lubrication, abrasive environment	Lubricate, use stainless pins
Belt stiffening	Cold temperature, material degradation	Switch to PP or PE for low temp
Cleanability issues	Wrong belt style, closed hinge	Switch to open hinge or perforated style

MODULAR BELT ENGINEERING SUPPORT

Uniking Canada provides complete modular belt system design.

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