FENNER DUNLOP

CONVEYOR BELTING AMERICAS

P S R™





ONE BRAND

ONE COMPANY

ONE PRODUCT LINE

Conveying Performance to the Power of 3

Why Trust Fenner Dunlop Americas *with Your Plied Belt Purchase?*

Answer: Millions of feet per year, Millions of reasons to purchase Fenner Dunlop's **PSR™** premium plied conveyor belting!

Fenner Dunlop's core business is conveyor belting. Each belt is engineered to produce measurable, sustainable results that assist the end-user in reducing costs, avoiding costs and improving revenue. Fenner Dunlop emphasizes higher performance standards by an individually tailored, total solutions approach.

Markets:

- Aggregates
- Forest Products
- Cement
- Sand & Gravel
- Recycling
- Steel/Foundries
- Hard Rock Mining
- OEM/Engineering
- Marine

PSR™ combines the best of Plylok Supreme® and Royalon® conveyor belting to exceed your expectations in plied conveyor belting. But not only are we uniting the characteristics of both brands, we are bringing together over 200 years of manufacturing know-how from five manufacturing plants into one high performance belt that will deliver measurable, sustainable results that you can count on.

Fenner Dunlop Takes Steps to Insure Productivity

Three Real Advantages…Performance to the Power[3]

1. Modern internal weaving capabilities means better control over:

- ▲ QUALITY
- ▲ LEAD TIMES
- ▲ COSTS
- ▲ SAFETY
- ▲ PRODUCT DEVELOPMENT
- ▲ REACTING TO CUSTOMERS' NEEDS

2. Engineering solutions through Research & Development allows us to:

- Develop products that provide unsurpassed load support, rip, tear & impact resistance, troughability and fastener retention.
- RFL treat our fabrics in-house to guarantee superior rubber adhesions
- Offer a complete range of compounds to improve performance
- Design versatile carcass constructions for each application
- Improve our products to serve the end-user better

3. Enhanced Performance characteristics, such as optimized fabric integrity, yield:

- Safer working conditions
- Better splice adhesions
- Enhanced trackability due to a balanced carcass
- Versatility to make what the customer needs

Fenner Dunlop's team of application engineers, territory sales managers and business managers takes the time to identify your needs by asking questions. Recommendations are based on careful research and analysis. We are committed to supporting each customer throughout the life of their belt!

PSR™ is Fenner Dunlop Americas premier heavy-duty plied conveyor belt product line. **PSR™** is constructed with tough synthetic fabric plies vulcanized together with premium rubber skims, creating superior adhesions to form a high performance carcass. Armoring this carcass with the correct cover compound guarantees maximum maintenance-free belt life. Fenner Dunlop offers a full range of cover compounds to suit each application: General Service, Fire Retardant, Fire & Oil, Oil Resistant, Heat Resistant, Heat & Oil and Specialty Covers

Experience in Belt Manufacturing Makes All the Difference

The proper carcass material in many applications will determine total belt life. Whether conveying coal, aggregate, sand, grain, wood products or mineral ore, **PSR™** can be manufactured to suit a specific application by utilizing our standard carcass or our custom carcass constructions:

1. Standard Carcass - Polyester Warp with Nylon Filling

The polyester/nylon carcass design offers the advantages of low overall stretch and excellent impact resistance properties. The nylon weft yarns, with its lower modulus and higher stretch characteristics, will accept more impact from sharp objects and impingement from trapped materials without fracturing. This feature makes nylon a logical choice for the crosswise or weft member in the **PSR™** belt fabric.

2. Custom Carcass - Nylon Warp with Nylon Filling

Fenner Dunlop manufactures a custom nylon/nylon carcass construction when there is a need for low modulus/high stretch conveyor belts dictated by specific applications.

Belt Elongation

PSR™ belts will elongate from 1.5% to 2.0% of total belt length depending on whether the carcass is the 110, 125, 200, 250, or 300 LB/PLY fabrics. These percentages are at full rated tension for the belt, total elastic and permanent elongation, when tested in accordance with ISO 9856. This elongation is the total for the life of the belt under normal operating conditions.

Unlike competitive belts in the market, an initial break-in period where fasteners must be installed to compensate for excessive elongation is not needed with **PSR™** conveyor belts. Fenner Dunlop Americas **PSR™** belts can be installed and vulcanized in one trip, reducing down time and costs by eliminating extra splices due to stretch.

Safety Factors

The minimum safety factor for all **PSR™** fabrics is 10 to 1 per ply. With polyester having a high modulus, excess elongation is not a consideration. Excessive elongation will cause a belt to shrink in width, resulting in a permanent cupping condition.

Choose **PSR™** *When You Need the Right Belt for the Job*

Fenner Dunlop Americas, with its many years as a textile manufacturer, has the ability to match the carcass design and the carcass materials to the application. This engineered approach results in performance you can measure.

- **Excellent load support**
- **Unsurpassed resistance to abrasion, cutting, gouging and tearing**
- **Low stretch**
- **Increased fastener retention**
- **Longer service life than most other plied belts**
- **Decreased downtime**
- **More material conveyed**
- **Savings to the bottom line!**

PSR™

PSR™ SPECIFICATION TABLE

PSR™ SPECIFICATIONS	FABRIC STYLE	PSR™ 80	PSR™ 110			
	BELT STYLE	**2-160**	**2-220**	**3-330**	**4-440**	**5-550**
	NUMBER OF PLIES	2	2	3	4	5
TENSION RATING [3] (PIW)		160	220	330	440	550
APPROX CARCASS GAUGE [4] - INCHES		.110	.128	.185	.228	.291
APPROX CARCASS WEIGHT [5] (LBS/IN/FT)		.042	.054	.081	.100	.130
IMPACT RATING [1] (FT-LBS)		335	475	665	875	1100
CONVEYOR	**MINIMUM PULLEY DIAMETER**					
	81% - 100% TENSION	14″	16″	20″	26″	30″
	61% - 80% TENSION	12″	14″	18″	20″	24″
	UP TO 60% TENSION	10″	12″	16″	16″	20″
	MINIMUM BELT WIDTH (INCHES) FOR EMPTY BELT TROUGHING [2]					
IDLER TYPE	20°	14″	16″	20″	24″	30″
	35°	18″	20″	24″	30″	30″
	45°	NR	24″	30″	36″	36″
	MAXIMUM BELT WIDTH (INCHES) FOR LOAD SUPPORT [2]					
20° IDLERS	0 - 40 # /CU.FT.	36″	48″	60″	72″	72″
	41 - 80 # /CU.FT.	30″	42″	54″	66″	72″
	81 - 120 # /CU.FT.	30″	36″	48″	60″	66″
	OVER 120 # /CU.FT.	NR	30″	42″	54″	60″
35° IDLERS	0 - 40 # /CU.FT.	36″	42″	54″	72″	72″
	41 - 80 # /CU.FT.	24″	36″	48″	60″	72″
	81 - 120 # /CU.FT.	24″	30″	42″	54″	60″
	OVER 120 # /CU.FT.	NR	24″	36″	48″	54″
45° IDLERS	0 - 40 # /CU.FT.	30″	42″	48″	60″	72″
	41 - 80 # /CU.FT.	24″	36″	42″	54″	66″
	81 - 120 # /CU.FT.	NR	NR	36″	48″	54″
	OVER 120 # /CU.FT.	NR	NR	30″	42″	48″
ELEVATOR						
TENSION RATING [3]						
ELEVATOR SERVICE (GRAIN, WOOD, CHIPS, ETC)		120	190	280	370	475
ELEVATOR SERVICE (INDUSTRIAL MINING, ETC)		100	170	250	330	425
	MINIMUM PULLEY DIAMETER					
	81% - 100% TENSION	16″	16″	20″	28″	36″
	61% - 80% TENSION	14″	14″	18″	22″	30″
	UP TO 60% TENSION	12″	12″	16″	20″	24″
	MAX BUCKET PROJECTION					
	CENTRIFUGAL	6″	6″	8″	10″	10″
	CONTINUOUS	NR	5″	7″	10″	12″

[1] Maximum impact is based on 10% lumps, with 90% fines (or sized material, up to 4″ lumps), plus the use of the appropriate rubber idlers and good design of the loading and transfer conditions. If these conditions are not met, fully, down-rate impact to one-half (or less) than that shown.

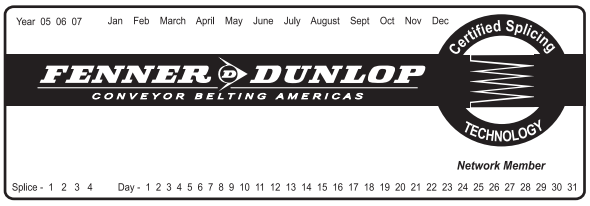
[2] Troughability and Load Support Tables can be influenced by certain cover gauge and compound combinations used.

[3] Tension Ratings reflect a minimum 10:1 per ply safety factor. With the appropriate selection & installation, a minimum of 4:1 safety factor can be applied with mechanical fasteners.

[4] Add gauge of both covers to carcass gauge to obtain the overall gauge.

[5] Add carcass weight to appropriate cover weight to obtain the total belt weight (In pounds per inch of width per linear foot of length).

PSR™ 125			PSR™ 150				PSR™ 200					PSR™ 250				PSR™ 300				PSR™ 500	
2-250	3-375	4-500	2-300	3-450	4-600	5-750	2-400	3-600	4-800	5-1000	6-1200	2-500	3-750	4-1000	5-1250	2-600	3-900	4-1200	5-1500	3-1500	4-2000
2	3	4	2	3	4	5	2	3	4	5	6	2	3	4	5	2	3	4	5	3	4
250	375	500	300	450	600	750	400	600	800	1000	1200	500	750	1000	1250	600	900	1200	1500	1500	2000
.138	.197	.246	.150	.183	.252	.321	.178	.225	.308	.391	.474	.192	.246	.336	.426	.176	.276	.376	.476	.414	.560
.059	.087	.109	.065	.080	.113	.147	.082	.108	.152	.196	.240	.087	.115	.162	.208	.077	.129	.181	.234	.186	.257
500	730	1035	665	875	1250	1320	805	1005	1290	1455	1690	915	1110	1300	1480	915	1130	1340	1555	1400	1750
16″	20″	28″	20″	26″	28″	32″	20″	24″	30″	36″	48″	20″	30″	36″	42″	20″	32″	40″	50″	42″	48″
14″	18″	24″	16″	20″	24″	26″	16″	20″	24″	32″	40″	18″	24″	30″	36″	18″	26″	32″	40″	36″	42″
12″	16″	20″	14″	16″	20″	22″	14″	18″	20″	26″	32″	16″	20″	24″	30″	16″	20″	26″	32″	30″	36″
14″	20″	30″	18″	24″	30″	36″	20″	28″	30″	36″	42″	24″	30″	36″	42″	28″	30″	36″	48″	42″	48″
18″	24″	30″	20″	30″	36″	36″	24″	30″	36″	42″	48″	30″	36″	42″	48″	30″	36″	42″	54″	48″	54″
24″	30″	36″	28″	36″	42″	42″	30″	36″	42″	48″	54″	36″	42″	48″	54″	36″	42″	48″	60″	54″	60″
54″	72″	84″	60″	72″	84″	84″	66″	84″	84″	84″	84″	72″	84″	84″	84″	72″	84″	84″	84″	84″	84″
48″	60″	72″	54″	60″	84″	84″	60″	72″	84″	84″	84″	66″	72″	84″	84″	72″	84″	84″	84″	84″	84″
42″	54″	66″	48″	54″	72″	84″	54″	66″	84″	84″	84″	60″	72″	84″	84″	60″	72″	84″	84″	84″	84″
36″	48″	60″	42″	48″	66″	72″	48″	60″	72″	84″	84″	54″	60″	72″	84″	54″	66″	72″	84″	84″	84″
48″	60″	72″	54″	66″	84″	84″	60″	72″	84″	84″	84″	66″	72″	84″	84″	72″	84″	84″	84″	84″	84″
42″	60″	66″	48″	60″	72″	72″	54″	60″	84″	84″	84″	60″	66″	84″	84″	60″	72″	84″	84″	84″	84″
36″	54″	60″	42″	54″	66″	66″	48″	54″	72″	72″	84″	54″	60″	72″	84″	54″	60″	72″	84″	84″	84″
30″	42″	54″	36″	42″	54″	60″	42″	48″	60″	66″	84″	48″	54″	66″	72″	48″	54″	66″	84″	72″	84″
48″	60″	72″	48″	60″	72″	84″	54″	66″	72″	84″	84″	60″	72″	84″	84″	66″	72″	84″	84″	84″	84″
36″	54″	60″	42″	54″	66″	72″	48″	60″	72″	84″	84″	54″	66″	84″	84″	54″	66″	72″	84″	84″	84″
30″	48″	54″	36″	48″	60″	60″	42″	54″	60″	72″	84″	48″	54″	60″	84″	48″	60″	66″	84″	72″	84″
NR	36″	48″	30″	36″	54″	54″	36″	42″	54″	66″	72″	42″	48″	54″	72″	42″	54″	60″	72″	72″	72″
210	320	425	260	390	520	645	345	520	690	870	1030	425	645	870	1060	520	765	1030	1275	1275	1700
195	290	390	230	350	465	580	310	465	620	775	930	385	580	775	960	465	695	930	1155	1155	1540
16″	20″	30″	18″	22″	32″	36″	20″	30″	36″	42″	54″	22″	30″	34″	46″	22″	34″	42″	54″	48″	54″
14″	18″	26″	16″	20″	26″	30″	18″	24″	30″	36″	48″	18″	24″	30″	38″	18″	28″	36″	42″	42″	48″
12″	16″	22″	14″	18″	22″	24″	16″	20″	24″	30″	42″	16″	20″	24″	32″	16″	22″	30″	36″	36″	42″
7″	9″	11″	7″	10″	11″	11″	10″	10″	11″	12″	12″	10″	11″	12″	12″	10″	11″	12″	12″	12″	14″
6″	8″	11″	6″	9″	12″	14″	9″	12″	14″	16″	20″	8″	14″	14″	18″	8″	14″	14″	18″	14″	16″



Certified Splicing Program

VALUE ADDED SERVICES CONTINUE to make the difference in winning and maintaining customer business in a competitive market. Fenner Dunlop has established a **Certified Splicing Program** geared to educate its distributor network. The Fenner Dunlop Splice Management team customizes each training session to ensure that participants increase their skill level and knowledge base in the areas needed to improve their level of service to their customers.

Highly skilled Certified Splice Technicians are on call to assist and to supply the end-users with the latest technology, materials and full endorsement from Fenner Dunlop when proper procedures, techniques and materials are used.

Certified Splicing Network Advantages

There are numerous advantages to being a member of Fenner Dunlop's Certified Splice Network.

- Guaranteed **Performance to the Power of 3**.
- Participation in Fenner Dunlop National Contracts.
- Partnership with the conveyor belting industry leader in technology and support.
- Member of Fenner Dunlop Distributor Gold Crown splicing support network.
- Increased skills, education and training in the most advanced rubber technology and splicing science for Belt Technicians.
- Fenner Dunlop Training includes but is not limited to the following:
  - Basic Splice Technology.
  - Splice material uses & limits.
  - Why special compounding for splicing?
  - Dynamic & static properties of splice materials.
  - Fundamentals of splice design & failure analysis.
  - The vulcanization process.
  - Splicing of multi-plied and straight–warp conveyor belt constructions.

- Fenner Dunlop Flexlok™ Technology for Straight–warp I & II constructions.
- Current Plied belt step splicing processes.
- Fundamentals of Steel Cable splice design & failure analysis.
- Current Steel Cable belt splicing techniques and procedures.
- Less customer downtime due to decreased splice failures and proper installations.
- Premium for highly skilled and educated service Technicians.

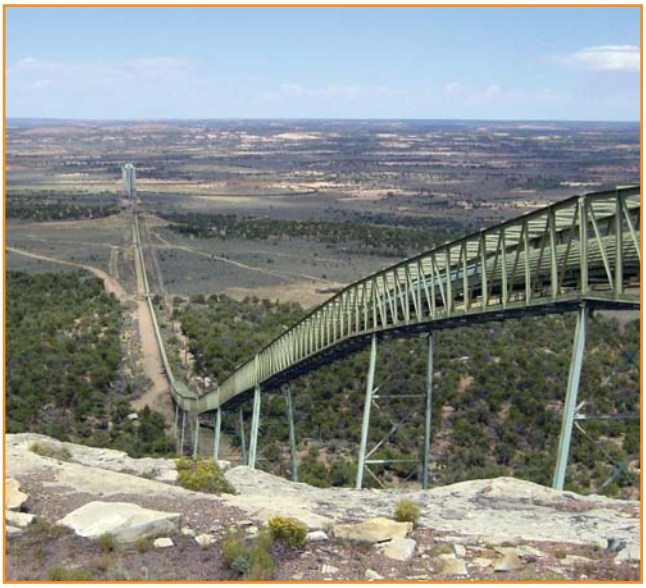
Services That Reduce Downtime and Lost Production

With the emergence of new technologies Fenner Dunlop Americas continually searches for innovative ways to provide total solutions-based service programs for the end-user. Fenner Dunlop now offers diagnostic and belt scanning services that will detect and alert customers of potential belt damage and failure in steel cord belting.

By providing services that can potentially detect a problem in a conveyor system prior to it becoming severe, Fenner Dunlop can alert on-site personnel and have the problem repaired or removed during the next scheduled maintenance window depending on severity. This type of proactive maintenance will see the conveyor system lasting well into the future and minimize unscheduled down time. Our remote and semi-remote systems allow monitoring to occur without stopping the belt.

DIAGNOSTIC SERVICES

- Belt mapping analysis
- Splicing quality assurance
- Splice failure analysis
- Splice monitoring system
- Non-destructive testing
- Belt wear analysis
- Conveyor structural analysis
- Textile Belt Analysis
- X-ray Services



Recommended Minimum Transition Distance

(At terminal pulleys for troughed belts)

A troughed conveyor belt changes from a troughed shape to a flat one in its passage from troughing idlers to a head pulley. Conversely, in its passage from a tail pulley to troughing idlers, it changes back into a troughed shape. At the area of change, the transition must occur over sufficient conveyor length in order to avoid excessive tension in the belt edges at a terminal pulley where the belt operating tension is high. At a low tension terminal, excessive edge tension will rarely be encountered, but here sufficient transition distance must be provided to keep the belt tension at the bottom of the trough great enough to avoid buckling and subsequent problems with belt splices.

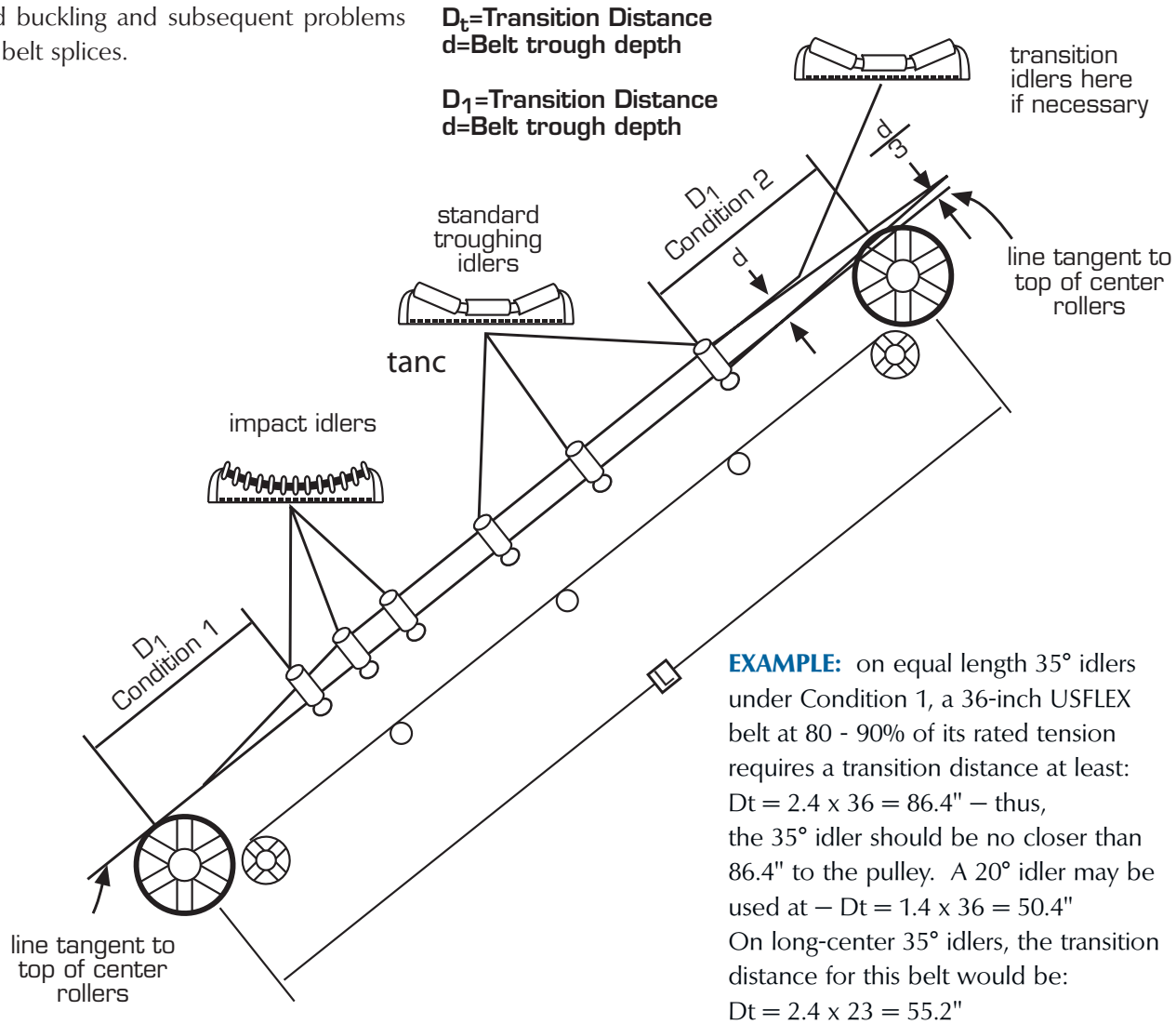
When required, belt support within the transition distance may be provided by using 20°, 271/2°, idlers between the pulley and the first (or last) 45° idler; or by using transition idlers with adjustable concentrator rolls.

Calculating Transition Distance

Multiplying the belt width (inches) by the table transition distance factor will give the minimum recommended transition distance (inches).

Long-center-roll idlers with unequal length rolls use factors in table, but use constant B = 23 instead of actual belt width.

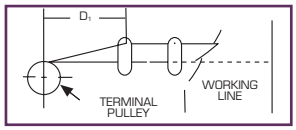
- Dt = Ft x b
- Dt = Minimum Transition Distance, Inches
- Ft = Transition Distance Factor
- b = Belt Width, inches



EXAMPLE: on equal length 35° idlers under Condition 1, a 36-inch USFLEX belt at 80 - 90% of its rated tension requires a transition distance at least:
Dt = 2.4 x 36 = 86.4" – thus,
the 35° idler should be no closer than 86.4" to the pulley. A 20° idler may be used at – Dt = 1.4 x 36 = 50.4"
On long-center 35° idlers, the transition distance for this belt would be:
Dt = 2.4 x 23 = 55.2"

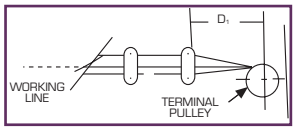
The following table lists the multiplying factors to be used according to type of belt, idler trough angle, belt elevation at the terminal pulley, and percent of belt rated tension at the terminal.

Condition 1



Top working face of pulley at belt's full troughed depth, with its working line tangent to the top of the central (horizontal) roll of the adjacent troughing idler … Commonly used arrangement at tail and other low tension terminals.

Condition 2



Top working face of pulley elevated to troughed load depth median. Working line tangent to pulley is above central roll of adjacent idler approximately 1/3 of belt's trough depth. Recommended arrangement for high tension terminals.

Idler	% Rated Tension	USFLEX® I	PSR™ and USFLEX® II	USFLEX® I	PSR™ and USFLEX® II
20°	90-100	1.8	1.8	1.2	1.2
	80-90	1.4	1.4	0.9	1.0
	70-80	1.2	1.2	0.8	0.8
	60-70	1.0	1.1	0.7	0.7
	30-60	0.9	1.0	0.6	0.6
	20-30	1.1	1.1	0.8	0.7
	10-20	1.6	1.2	1.0	0.8
	5-10	2.2	1.4	1.5	1.0
27 1/2°	90-100	2.4	2.4	1.6	1.6
	80-90	1.9	1.9	1.3	1.2
	70-80	1.6	1.6	1.0	1.0
	60-70	1.4	1.4	0.9	0.9
	30-60	1.3	1.3	0.8	0.8
	20-30	1.5	1.4	1.0	0.9
	10-20	2.1	1.6	1.4	1.1
	5-10	3.0	1.9	2.0	1.2
35°	90-100	3.0	3.2	2.0	2.1
	80-90	2.4	2.4	1.6	1.6
	70-80	2.0	2.0	1.3	1.4
	60-70	1.8	1.8	1.2	1.2
	30-60	1.6	1.6	1.1	1.1
	20-30	1.9	1.8	1.3	1.2
	10-20	2.6	2.0	1.8	1.4
	5-10	3.7	2.4	2.5	1.6
45°	90-100	3.8	3.9	2.5	2.6
	80-90	2.9	3.0	1.9	2.0
	70-80	2.4	2.5	1.6	1.6
	60-70	2.2	2.2	1.4	1.5
	30-60	2.0	2.0	1.3	1.4
	20-30	2.3	2.2	1.5	1.5
	10-20	3.3	2.5	2.2	1.6
	5-10	4.6	3.0	3.1	2.0

Note: Transition tables should only be used as a general guideline and should not be a factor in the final determination for the accurate transition distance for a particular application. Consult your Belt Wizard or a **Fenner Dunlop** Engineer for the proper transition distances

Distributor Networks

Fenner Dunlop is proud to partner with distributors that are focused on providing quality conveyor belts and superior service to the industry. For this reason, **Fenner Dunlop** has one of the strongest distributor networks in the belting industry. To promote and distinguish **Fenner Dunlop** distributors as conveyor belt professionals, we have two distributor classifications.

Total Conveyor Solutions Distributors (TCSD) are authorized distributors of **Fenner Dunlop** products that service all aspects of the conveyor belt industry. The TCSD distributor provides not only conveyor belt and technical expertise, but also conveyor components and in-house factory trained field service personnel. The TCSD offers a complete conveyor system service package.

Advanced Service Distributors (ASD) are authorized distributors of **Fenner Dunlop** products that have completed **Fenner Dunlop's** comprehensive Sales and Technical Training Program. The ASD has been factory trained and certified in belt constructions, selection, trouble shooting and conveyor maintenance.

Other Trusted Fenner Dunlop Americas Brands:
CLEATLOK®
FERROFLEX®
FLEXLOK™
GEORGIA DUCK®
GOLDLINE®
HARVEST®
HOTSHOT®
KORDLOK®
POWERLINK I & II®
QUARRY KING®
SADDLEFLEX™
SCANDURA®
SECURITY®
VALUELINE®

FENNER DUNLOP
CONVEYOR BELTING AMERICAS

Contact your authorized Fenner Dunlop Distributor for any and all of your conveyor and elevator belting applications.

A member of
FENNER DUNLOP
CONVEYOR BELTING WORLDWIDE

Industrial Belting Sales:
(800) 241-1863
(404) 297-3170

Mining Sales:
(800) 537-4483
(419) 635-4068

Steel Cord and Export Sales:
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(705) 645-2228

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