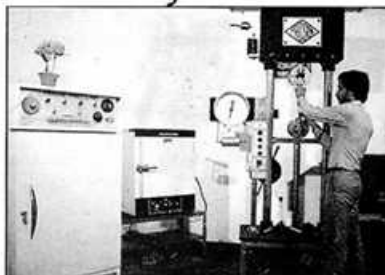


Looking toward tomorrow with fresh visions

With inventive new approaches and advanced new technologies, we are steadily creating a new generation of "Universal" products. Sincerely with a motto of "High-Quality, high performance "Universal", product development involves the repetition of carefully conducted tests in its most advanced laboratory.

Anil Gupta
Anil Gupta
Vice President



Conveyor Belts are lucratively employed for carrying and lifting materials by a number of industries such as thermal power, coal, mining, cement, fertilizer, sugar, tea estates etc. and Universal offers ideally designed belts, for optimum resistant to the most common forms of damage from abuse.

Conveyor Belting Specifications Range

BELT WIDTHS

From 150 to 1600mm as per IS: 1891 & ISO 4195 in open or endless length as per customer's requirements sub. to length tol. 5%, -1%

REINFORCEMENT MATERIAL

In various strength ratings of fabrics in cotton/cotton (CC), nylon/nylon (NN) and polyester/nylon (EP). In cotton carcass, fabric types available are 28oz., 32oz., 36oz., for conveyor belt application and 34oz hard duck for elevator belting.

In nylon carcass, belt types available are 250/2, 315/2, 315/3, 400/3, 400/4, 500/3, 500/4, 630/3, 630/4, 800/4, 800/5, 1000/4, 1000/5, 1250/4, 1250/5, 1400/5, 1600/5 & 1800/6 in 3 duty types namely, General Duty, Heavy Duty and Extra Heavy. While, for instance, all nylon 500/3 represents a belt having full thickness tensile strength of 500 KN/m width, incorporating 3 plies of nylon fabric. And the difference in interply thicknesses indicates the Duty types being designed for adequate load support & impact cushioning during material handling.



PLY CONSTRUCTION

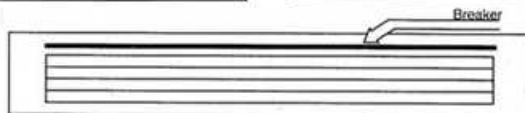
Universal Conveyor Belts are manufactured in monopoly and in multiples ranging upto 12 plies in different constructions, viz, straight ply (widely used & popular), stepped ply construction, and breaker ply construction (for protection against longitudinal impact breaks).

Plies may be skim coated where service conditions are severe.



EDGE CONSTRUCTION

Universal All cotton conveyor belting is supplied in moulded edges to protect against edge wearing and prevent ingress of moisture, while NN or EP conveyor belting can be supplied both in cut edges as well as in moulded edges. However, Universal recommends a cut-edge construction for NN/EP beltings due to complete rot resistance.



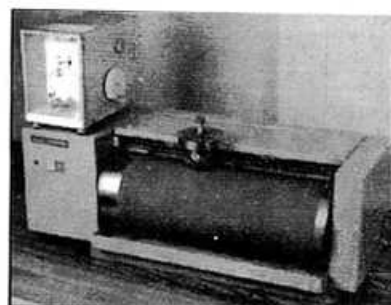
COVER GRADES

The rubber cover should be selected wisely by taking into account the type of materials to be handled and the operating condition of the belt. The thicknesses manufactured are 1 to 16 mm, and in steps of 0.5 mm available in the following grades:

Grade	Conforming To Standards	Applications			Physical Properties		
		Characteristics	Material Reference	Material Temp. Range	Tensile Strength (Min.) Kg/cm	Elongation (Min.) %	Abrasion (Max.) mm
General Purpose							
M - 24 (M, A)	IS. 1891 (Part I) BS. 490 (Part I)	High tensile strength and superior in abrasion, cut and gauge resistance. Recommended for transporting highly abrasive materials.	Metallic ore, Coke Stone, Copper ore, Limestone, Broken glass, etc.	(-) 45° C to +60° C	245	450	150
Heat Resistant							
Universal "BLAZE" (HR)	IS. 1891 (Part I) T ₁	Super in heat and abrasion resistant.	Cement, Chemicals, Soda ash, etc.	+ 65° C to +120° C	130	350	250
Universal "BETAPLUS" (Super HR)	IS. 1891 (Part II) T ₂	Heat and abrasion resistant.	Cement clinker, Foundry sand, Sintered ore, etc.	+ 65° C to +150° C	130	350	250

(Remarks) * Testing method of abrasion as per DIN 22102.

sub. to (-20% tol.)



Abrasion Resistance Test

Please consult us for special grades or for your other requirements.

COVER THICKNESS SELECTION

In addition to selecting a correct rubber cover grade, right thickness of rubber cover must also be considered accordingly, a consideration of "Frequency Factor" is in order. Belt cycle frequency increases with increased belt speed and decreases as the conveyor length increases. The more often a given section of belt carries a load but faster will be a wear rate. For instance, the cover of a 25ft. belt carries twice as much material at 200ft. per minute as it does at 100ft. per minute. Similarly, at the same speed, the 25ft. belt carries a load twice as often as does the 50ft. belt. Hence frequency factor can be calculated as below :

$$\text{Frequency Factor} = \frac{\text{Belt Length}}{\text{Belt Speed in ft./min.}} = \text{Minutes (min.)} \quad (\text{no. of minutes the belt takes to complete one revolution})$$

Once frequency factor is determined as per stated formula, requirement of correct rubber cover thickness can also be calculated by going through the table :

CONVEYOR BELT RUBBER COVER THICKNESS IN MM (TOP/FACE)

Recommendation For Bulk Materials (Cold) with Normal Loading Conditions

Frequency Factor (Minutes)	Moderately Abrasive (N-17 Grade)				Very Abrasive (M-24 Grade)				Very Sharp Abrasive (H-TEX Grade)			
	Materials like coal, wood chips, fine-ores, clay unground, charcoal grain etc.				Materials like metallic ore, salt, lime-stone, coke, stone, broken glass, phosphate, rock, slag, sand, sinter, fertilizers, fine-dust, etc.				Materials like foundry refuse, quartz, sand, copper ore, iron borings etc.			
	Lump Size (in inches)				Lump Size (in inches)				Lump Size (in inches)			
	Dust to 1/4	1/2 to 1	2 to 5	6 and above	Dust to 1/4	1/2 to 1	2 to 5	6 and above	Dust to 1/4	1/2 to 1	2 to 5	6 and above
0.2	2.5	4.5	5	10	5.5	10	10	10	9	10	10.5	11
0.4	1.5	4	4.5	7	4	7	9.5	9.5	6	9	10	10
0.6	1.5	3	4	5	3	6	8	9.5	4.5	6	9.5	10
0.8	1.5	2.5	3	4.5	3	5	6	9	4	5	9	9.5
1.0	1.5	2.5	3	4.5	3	4	5	8	3	4.5	8	9.5
1.5	1.5	2.5	3	4.5	3	3	5	7	3	4	7	8
2.0	1.5	2.5	3	4.5	3	3	4.5	6	3	3	5	7
3.0	1.5	2.5	3	4.5	3	3	4	5	3	3	4.5	7
4.0 and above	1.5	2.5	3	4	3	3	3	4.5	3	3	4.5	6.5

BELT ENDLESSING (SPLICING)



Conveyor Belting can be rendered endless by jointing the two ends of a length of belt either by vulcanised splicing or using mechanical fasteners.

The former is recommended for better results.

Splicing: V-shaped (often called diamond) type of joints are strongly recommended.

The extra length required to make the belt endless to requisite size shall be calculated by the following formula :

Splice Length = W + 150 (N-2) + 25mm where, W is width of belt (in mm), N is the number of plies.

The av. approx. weight of rubber cover be taken as 0.034 Kg/25mm width/per mm thick cover per meter length (±8%)

All Nylon (NN) NOMENCLATURE

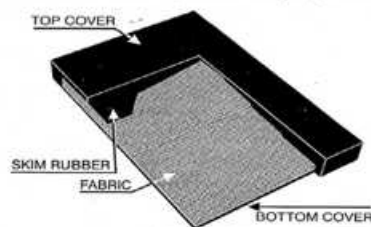
Universal All Nylon Conveyor Belts are designed to indicate the minimum full thickness tensile strength and the number of fabric plies in the belt, for eg., All Nylon 500/3 represents a belt having full thickness tensile strength of min. 500KN/m width (= 1275 kg/cm), incorporating 3 plies of nylon fabric.

Belt Designation	Maximum Allowable Working Tension	Nominal Carcass Thickness	Nominal Carcass Weight	Maximum Belt Width (mm) For Adequate Load Support (Material Bulk Density)			Maximum Belt Width (mm) For Adequate Troughing (Angle of picking idlers)			
				Upto 800	Upto 1500	Upto 2500	20'	35'	45'	
GENERAL DUTY (TYPE A)	250/2	25	2.1	0.020	650	600	450	350	400	450
	315/2	31	2.2	0.023	800	700	600	350	400	450
	315/3	31	3.0	0.028	1000	800	650	400	450	500
HEAVY DUTY (TYPE B)	250/2	25	2.6	0.030	900	650	500	450	450	500
	315/3	31	3.7	0.039	1200	1000	800	450	500	500
	400/4	44	4.8	0.048	1300	1100	850	500	500	600
	500/4	50	5.0	0.046	1400	1200	900	500	500	650
	630/3	63	4.2	0.047	1400	1200	1000	500	500	650
	630/4	70	5.4	0.052	1800	1400	1200	500	650	800
	800/4	90	5.6	0.054	1800	1600	1400	650	800	900
	1000/5	120	7.0	0.070	1800	1600	1400	700	850	1000
1250/5	140	7.5	0.076	1800	1600	1400	800	1000	1000	
EXTRA HEAVY DUTY (TYPE C)	500/4	55	5.5	0.061	1400	1200	800	500	500	650
	630/4	70	5.9	0.067	1400	1200	850	500	500	650
	800/4	90	6.2	0.070	1600	1400	1000	500	500	650
	1000/5	120	7.7	0.085	1800	1500	1300	500	650	800
	1250/5	140	8.3	0.092	1800	1800	1600	650	800	900
	1600/5	180	9.4	0.097	2000	2000	1800	800	900	1000
	1800/6	190	10.6	0.120	2000	2000	2000	800	900	1000

All Cotton (CC) NOMENCLATURE

Fabric Type	Approx. thickness ply (mm)	Approx. weight kg/cm width/mtr.	Av. Breaking Strength of individual fabric N/cm width		Maximum allowable working tension N/cm/ply			
			Warp	Weft	Mechanical Fasteners			
					Screw Take-up		Gravity Take-up	
28oz	1.20	0.012	625	335	44.1	47.1	47.1	52.9
32oz	1.25	0.014	690	370	52.9	55.9	55.9	60.8
34oz	1.30	0.017	670	480	52.9	55.9	55.9	60.8

4 Ply 28oz, 5 Ply 32oz, are std. popular belt strengths used in major applications.



Other constructions can be exclusively designed and manufactured against specific requirements. In the light of technological development, "Universal" reserves the right to alter the specification parameters without notice.

RECOMMENDED MINIMUM PULLEY DIAMETER FOR CONVEYOR BELTS

It may please be carefully noted that the use of pulleys of diameters that are too small for the thickness of belting of the type of fabric used may lead to serious problems viz., ply separation and in worst cases, the premature failure of the fabric altogether. It is, therefore, suggested that the pulley diameter should at least be not less than those as is explained and shown in the table:

Carcass Thickness (mm)		Recommended Minimum Pulley Diameter (mm)										
Fabric Type		Percentage of maximum allowable working tension used										
All Cotton	All Nylon	Upto 30%			Over 30 upto 60%			Over 60 upto 100%				
		Type of Pulley			Type of Pulley			Type of Pulley				
From	To	A	B	C	A	B	C	A	B	C		
2.0	3.1	2.3	2.7	160	160	125	200	160	125	250	200	160
3.2	3.9	2.8	3.5	200	200	160	250	200	160	315	250	200
4.0	6.0	3.6	4.4	250	250	200	315	250	200	400	315	200
5.1	6.2	4.5	5.5	315	315	250	400	315	250	500	400	315
6.3	7.8	5.6	7.0	400	400	315	500	400	315	630	500	400
7.9	10.0	7.1	8.8	500	500	400	630	500	400	800	630	500
10.1	12.5	8.9	11.1	630	630	500	800	630	500	1000	800	630
12.6	15.8	11.2	13.8	800	800	630	1000	800	630	1250	1000	800
15.7	17.5	13.9	15.5	1000	1000	800	1250	1000	800	1400	1250	1000
17.6	20.0	15.8	17.7	1250	1000	800	1250	1000	800	1600	1250	1000

A : Driving Pulleys and pulleys exposed to high belt tension, for example, main driving pulley on the head or on the tail; delivery pulleys under full tension; loop pulleys in the tripper and terminal head pulleys in the case of tail driving, etc.

B : Snub Pulleys in the return run under lower belt tension, for example, terminal tail pulleys in the case of head driving; terminal head pulleys for down hill conveying. If the terminal tail pulley is braked, snub and bend pulleys in take-up devices.

C : Bend pulleys, for a change of direction of the belt of less than 30°

Notes: The belt carcass is the distance between the highest points of the upper layer of fabric and the lowest points of the layer.

POLYESTER NYLON (EP) NOMENCLATURE

Belt Designation	Minimum Breaking Load of Belt at Full Thickness		Thickness of Carcass (approx. mm)	
	Longitudinal direction (KN/m. width)	Transverse direction (KN/m. width)		
EP200/2	2EP100	200	80	2.1
EP250/2	2EP125	250	100	2.3
EP315/2	2EP160	315	125	2.4
EP315/3	3EP100			3.2
EP400/2	2EP200			2.5
EP400/3	3EP125	400	160	3.4
EP400/4	4EP100			4.1
EP500/2	2EP250			2.8
EP500/3	3EP160	500	200	3.4
EP500/4	4EP125			4.2
EP630/3	3EP200	630	250	3.6
EP630/4	4EP160			4.5
EP800/3	3EP250			4.2
EP800/4	4EP200	800	320	4.7
EP800/5	5EP160			5.6

The value of minimum breaking load in kg/cm can be obtained by multiplying the value in kN/m. by 1.0197 (1.0 kN/m. = 1.0197 kg/cm.)

ELEVATOR BELTING

Elevator beltings are employed for very steep or vertical conveyance. Rubber elevator belts are recommended for centrifugal or continuous discharge of materials like coal, sand, clay, sugar, lime, cement and certain dry chemicals and manufactured in **all-cotton** 34oz., hard duck fabric.

Minimum Number of Plies for Elevator Belting

Class of material	Lumpy/Sticky materials, heavy ores or other minerals	Gravel/Coarse sand, crushed stone, coal, lighter ores, etc.	Cement, dry sand, pea coal, fertilizer etc. (heavy but free from lumps)	Light powdery or free flowing materials free from lumps	Projection of Buckets							
						100 mm	125 mm	150 mm	175 mm	200 mm	225 mm	250 mm
						5	4	4				
	7	6	5	4								
	7	6	5	5								
	8	7	6	5								
	8	7	6	5								
	8	7	6	5								
	8	7	6	5								
	8	7	6	5								

Top & Bottom Covers Thickness for Elevator Belting

Service	Thickness of covers	
	Pulley side (Bottom)	Bucket side (Top)
Dry, fine material	1.5 mm	1.0 mm
Ash, coarse coal, sand and gravel, crushed stone or wet ores	1.5 mm to 3.0	1.0 mm to 1.5
Coarse gravel, Coarse stone, Heavy buckets or severe abrasion	2.5 mm to 3.0 mm	1.5 mm to 3.0 mm
Most Severe Service due to abrasion or large buckets	5.00 mm to 6.00 mm	3.00 mm to 5.00 mm

Minimum Pulley Diameters for Elevator Belting

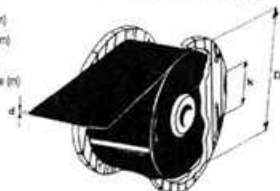
Number of plies	Minimum Pulley diameters (mm)	
	Head Pulley	Boot Pulley
4	500	350
5	600	450
6	750	500
7	900	600
8	1050	700

RECOMMENDED PITCH OF IDLER SETS

Belt Width (mm)	Recommended pitch of idler sets, m			Return Idler sets
	Carrying idler sets			
	Bulk Density of material, Kgs/m ³			
	400 to 1200	1200 to 2000	above 2001	
300				Three for any width of belt
400				
500	1.5	1.4	1.2	
650				
800				
1000	1.4	1.2	1.0	
1200				

CALCULATION OF BELT ROLL DIAMETERS

Where D = Roll Diameter (m)
 d = Belt Thickness (m)
 L = Belt Length (m)
 K = Diameter of Core (m)



$$D = \frac{4d \cdot L}{\pi} + K \text{ (m)}$$

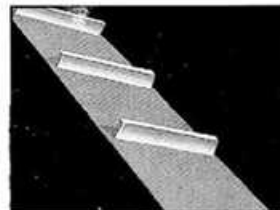
CLEATS TYPE CONVEYOR BELTS



Chevron Cleats

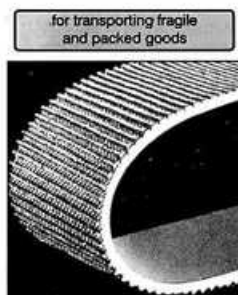


Side Walls Cleats



Full Width Cleats

ROUGH TOP CONVEYOR BELT



for transporting fragile and packed goods

Manufactured upto 1000mm width in different strength ratings and cover thicknesses in Grade M24='A' in two popular designs - Fluted (rough top) and Fishbone (rough top)

- Inclined Conveyor
- Loading Conveyor
- Intermediate Conveyor
- Discharge Belt
- Bottom Conveyor
- Top Conveyor
- Telescopic Conveyor
- Bag Diverter
- ... and many more



PVC COATED

Style	Std. Thickness (mm)	Av. T.S. Kg/2.5mm
PP T-1	1.3	300
PP T-2	1.7	500
2PN/1/0**	2.9	