HIC International Co Inc

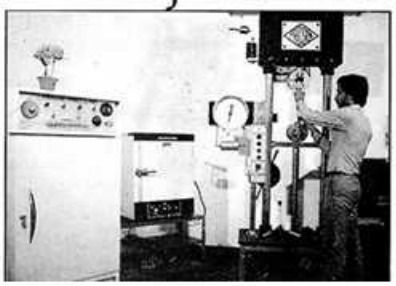
PH: 011 - 5547 2400, 2874 5120

UNIVERSAL

Looking toward tomorrow with fresh visions

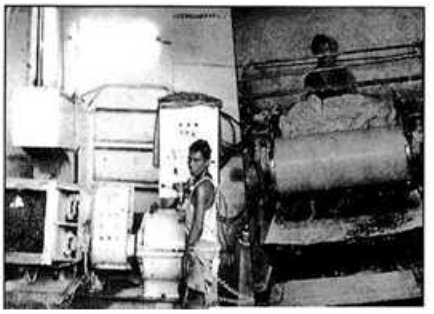
With inventive new approaches and advanced new technologies, we are steadily creating a new generation of **"Universal"** *products. Sheerly with a motto of "High-Quality, high performance* **"Universal"**, *product development involves the repetition of carefully conducted tests in its most advanced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

Anil Gupta
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

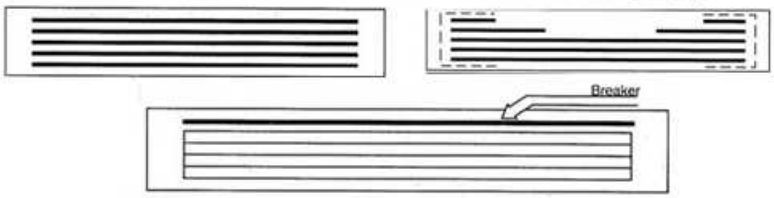
In various strength ratings of fabrics in **cotton/cotton** (CC), nylon/nylon (NN) and polyester/nylon (EP). In cotton carcass, fabric types available are **28oz., 32oz., 36oz.,** for conveyor belt application and **34oz** hard duck for elevator belting.

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 monoply 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.

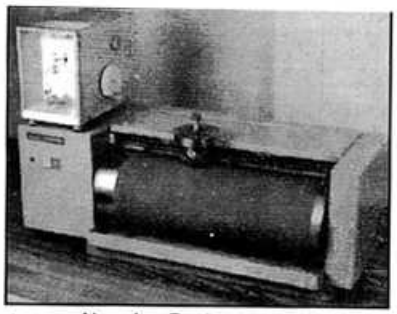
COVER GRADES

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.	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.	Heat and abrasion resistant.	Cement clinker, Foundry sand, Sintered ore, etc.	+ 65°C to +150°C	130	350	250
Universal "SUN" (Superior HR)	Mfd. to our Universal Standards	Surface of rubber cover hardens by heat and shallow cracks occasionally.	Iron pellet, Hot coke, Burnt limestone, etc.	+ 65°C to +180°C	110	350	250

(Remarks) * Testing method of abrasion as per DIN 22102. # sub. to (-20% tol.)

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



Abrasion Resistance Test

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Material Handling & HillDrive Hydraulics Solutions

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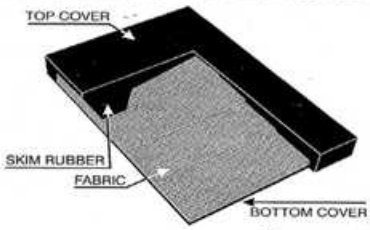
COVER THICKNESS SELECTION

Frequency Factor = $\frac{\text{Belt Length}}{\text{Belt Speed in ft./min.}}$ = Minutes (min.)
(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 with Normal Loading Conditions								
	Very Abrasive (M-24 Grade)				Very Hot Abrasive (HR T_1 Grade)			
Frequency Factor (Minutes)	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)			
	Dust to 1/4	½ to 1	2 to 5	6 and above	Dust to 1/4	½ to 1	2 to 5	6 and above
0.2	5.5	10	10	10	9	10	10.5	11
0.4	4	7	9.5	9.5	6	9	10	10
0.6	3	6	8	9.5	4.5	6	9.5	10
0.8	3	5	6	9	4	5	9	9.5
1.0	3	4	5	8	3	4.5	8	9.5
1.5	3	3	5	7	3	4	7	8



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 Type	Rating	Maximum Allowable Working Tension KN/m	Nominal Carcass Thickness (mm)	Nominal Carcass Weight Kg./cm. Width/mtr.	Maximum Belt Width (mm) For Adequate Load Support (Material Bulk Density) (Kg./m') Upto 800	Upto 1500	Upto 2500	Maximum Belt Width (mm) For Adequate Troughing (Angle of picking idlers) 20°	35°	45°
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

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			
					Mechanical Fastners		Vulcanised Splices	
			Warp	Weft	Screw Take-up	Gravity Take-up	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.

RECOMMENDED MINIMUM PULLEY DIAMETER FOR CONVEYOR BELTS

Carcass Thickness (mm)				Recommended Minimum Pulley Diameter (mm)								
Fabric Type				Percentage of maximum allowable working tension used								
All Cotton		All Nylon		Upto 30% Type of Pulley			Over 30 upto 60% Type of Pulley			Over 60 upto 100% Type of Pulley		
From	To	From	To	A	B	C	A	B	C	A	B	C
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	15.6	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	15.6	17.7	1000	1000	800	1250	1000	800	1600	1250	1000

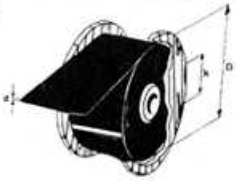
A : Driving Pulleys **B** : Snub Pulleys **C** : Bend pulleys,

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

CALCULATION OF BELT ROLL DIAMETERS

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

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



POLYESTER NYLON (EP) NOMENCLATURE

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

RECOMMENDED PITCH OF IDLER SETS

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

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MINIMUM BELT STRENGTH RECOMMENDATIONS

Material Bulk Density (kg/m³)

WIDTH (mm)	Idlers	Upto 800 Coke, Carbon, grains, etc.		800 to 1500 lime, clay, etc.		>1500 upto 2500 rock, quartz, etc.	
		All-Cotton	All-Nylon/E.P.	All-Cotton	All-Nylon/E.P.	All-Cotton	All-Nylon/E.P.
500	A	3 ply x 28oz	200/2 G.D	3 ply x 32oz	200/2 G.D	4 ply x 28oz	315/2 G.D. 250/2 H.D.
	B	3 ply x 32oz	200/2 G.D.	4 ply x 28oz	200/2 G.D.	4 ply x 32oz	200/2 H.D
600 650	A B C	3 ply x 28oz 4 ply x 28oz 4 ply x 32oz	200/2 G.D. 250/2 G.D. 250/2 G.D.	4 ply x 28oz 4 ply x 32oz 5 ply x 28oz	315/3 G.D. 315/3 G.D. 315/3 G.D.	4 ply x 32oz 5 ply x 32oz 5 ply x 36oz 6 ply x 32oz	315/3 H.D. 400/3 H.D. 400/4 H.D.
750 800	A B C	3 ply x 28oz 4 ply x 28oz 5 ply x 28oz 4 ply x 32 oz	315/2 G.D. 315/2 G.D. 315/3 G.D.	4 ply x 28oz 4 ply x 36oz 5 ply x 28oz 5 ply x 36oz 6 ply x 28oz	315/3 G.D. 315/3 G.D. 400/3 H.D.	5 ply x 28oz 6 ply x 28oz 5 ply x 36oz 6 ply x 32oz	315/3 H.D. 500/3 H.D. 500/4 H.D.
900 1000	A B C	4 ply x 28oz 4 ply x 36oz 5 ply x 32oz 5 ply x 42oz	315/3 H.D. 315/3 H.D 400/3 H.D.	5 ply x 36oz 5 ply x 42oz 6 ply x 42oz	500/3 G.D. 500/3 G.D. 500/4 H.D.	5 ply x 42oz 6 ply x 42oz 6 ply x 48oz	630/3 H.D. 630/4 H.D. 500/4 E.H.
1050	A B C	5 ply x 32oz 5 ply x 36oz 5 ply x 42oz	500/3 G.D. 500/3 G.D. 500/3 H.D	5 ply x 36oz 5 ply x 42oz 6 ply x 42oz	500/3 H.D. 500/3 H.D. 500/4 H.D.	6 ply x 42oz 6 ply x 48oz 7 ply x 48oz	630/4 H.D. 630/4 H.D. 630/4 E.H.
1100 1200	A B C	5 ply x 32oz 5 ply x 42oz 6 ply x 42oz	630/3 G.D. 500/3 H.D. 500/3 H.D. 500/3 H.D.	5 ply x 42oz 6 ply x 42oz 7 ply x 42oz	630/3 G.D. 500/4 H.D. 630/3 H.D. 500/4 H.D. 500/4 H.D.	Not Recommended	800/4 E.H. 1000/4 E.H. 1000/5 E.H.

Idlers:
A 20° angle
B 20° over to 35° angle
C over 35° to 45° angle

Please note the table to be taken as a mere guide for quick reference and the accuracy is not guaranteed. The fully correct strength ratings may please be arrived after taking into account the belt conveyor system parameters in detail.

Please do not hesitate to consult us by giving complete details for your requirement of transporting the material. The smallest detail relative to operating conditions can have a "success or failure" impact upon the belt installation. Even applying one part per million of edible oil to grain (to control grain dust) will destroy an ordinary, general purpose rubbers.

MINIMUM INFORMATION REQUIRED TO BE SUPPLIED WHILE SENDING ENQUIRIES OR ORDERS

1) Belt Width (mm)
2) Number of Plies
3) Type of Fabric
4) Duty type
5) Thickness of Rubber Cover on Top (mm)
6) Thickness of Rubber Cover on Bottom (mm)
7) Grade of Rubber Cover
8) Length of Belt Reqd. (mtrs.)
9) Ends of the Belt (open or endless).

ELEVATOR BELTING

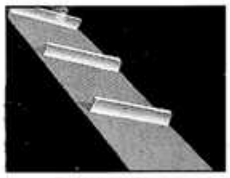
Elevator beltings are employed for very steep or vertical conveyance. Rubber elevator belts are recommended for centrifugal or continuous discharge of materials like coal, sand, clay, sugar, lime, cement and certain dry chemicals and manufactured in **all-cotton** 34oz., hard duck fabric.

CLEATS TYPE CONVEYOR BELTS

Chevron Cleats

for transporting bulky products at high inclination angle

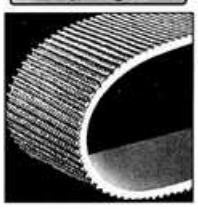
Side Walls Cleats



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

WORK WITH YOUR "UNIVERSAL" REPRESENTATIVE, HE IS WELL TRAINED - HE CAN ASSIST

Special Note for Use of Heat Resistant Grade Conveyor Belting

a) Please do not halt the belt when loaded with hot materials.

b) Please use belt with maximum cover thickness, wherever economically feasible.

c) Please use cooling systems like water sprinkling wherever possible. Application of sprinkled water on the belt surface at the tail pulley is the best. Sprinkling water will help prolong the life of the belt.

d) Please ensure that loading chutes are so designed that lets the carrying materials fall evenly on the belt instead of falling at a particular area of the belt surface.

e) Please bear in mind that **HR Grade** belts cannot be repaired after it has been in service for a certain period as in the case of general purpose conveyor belting viz, **M-24** or **N-17** grade. Hence repairs may please be carried out as and when damages occur.

Service with a smile

Like other equipments, conveyor belting is likely to depreciate over a period of time thus affecting the life. The service requirements may also have changed.

"Universal" undertakes to inspect such installations and append recommendations for the most feasibly economical belt suitable for any given working condition.

Trust this catalogue would prove useful to all those Engineers in innumerable industries in home and abroad in deriving optimum life from the belt.

SPECIAL BELTS DEVELOPED FOR CEMENT PLANTS

SHR Grade Belts is our speciality

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