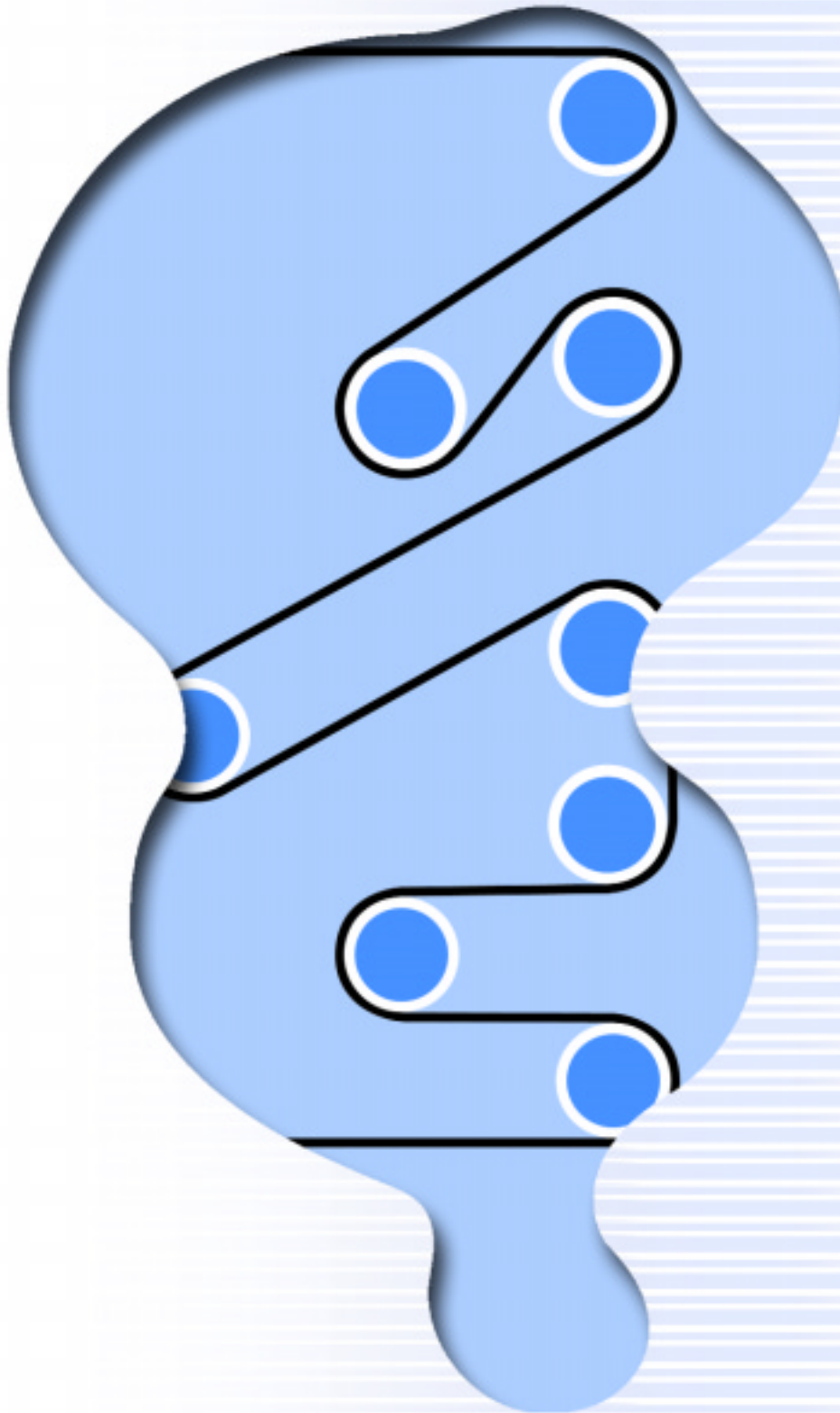


Power **TRANSMISSION** engineering & design



NITTA

U-PT-02

SPECIFICATIONS

NITTA POWER TRANSMISSION BELTING, TEXTILE & MACHINE TAPES

Properties

High strength pre-set nylon core.
Highly abrasion resistant, oil and chemical resistant rubber covers; superior resistance to flexing fatigue.

Chemical Resistance

Resistant to Fats, Oil, Grease, Gasoline, Humidity, Steam, Dryness, Dust, many Chemicals and Solvents. Not resistant to Phenol, Cresol and Concentrated Acids.

Temperature Range

Continuous	Intermittent
-20 to +60°C	-30 to +100°C
-4 to +140°F	-22 to +212°F

Polybelt-Rubber Covers

BELT TYPE COVER	ENGLISH STANDARD							METRIC					
	NYLON TYPE	Minimum Pulley Diameter in.	Standard Pulley Diameter in.	Thick in.	Weight lbs./sq. ft.	Shaft Load @ 2% lbs./in.	Approx. Skive Length in.	Minimum Pulley Diameter mm	Standard Pulley Diameter mm	Thick mm	Weight g/cm.m	Shaft Load @ 2% N/mm	Approx. Skive Length mm
SG	250	0.6	1.0	0.031	0.16	34	0.59	15	25	0.8	7.8	6	15
	350	1.0	1.4	0.035	0.18	60	0.75	25	35	0.9	8.8	10.5	19
	500	1.4	2.0	0.043	0.23	86	0.98	35	50	1.1	11.2	15	25
	750	2.0	3.0	0.051	0.29	129	1.10	50	75	1.3	14.1	22.5	28
	1000	2.8	3.9	0.063	0.35	171	1.14	70	100	1.6	17.1	30	29
L LA	250	0.6	1.0	0.055	0.29	34	0.87	15	25	1.4	14.1	6	22
	350	1.0	1.4	0.059	0.33	60	1.00	25	35	1.5	16.1	10.5	25
	500	1.4	2.0	0.063	0.37	86	1.13	35	50	1.6	18.0	15	29
	750	2.0	3.0	0.087	0.51	129	1.63	50	75	2.2	24.9	22.5	41
	1000	2.8	3.9	0.098	0.57	171	1.75	70	100	2.5	27.8	30	44
	1500	3.9	5.9	0.122	0.70	257	2.13	100	150	3.1	34.1	45	54
TFL	2000	5.5	7.9	0.142	0.82	343	2.50	140	200	3.6	40.0	60	64
	6S	1.6	2.4	0.087	0.49	131	1.61	40	60	2.2	24.0	23	41
	7S	2.0	2.8	0.094	0.53	149	1.69	50	70	2.4	26.0	26	43
	10S	2.8	3.9	0.102	0.57	223	1.75	70	100	2.6	27.8	39	45
	15S	4.3	5.9	0.122	0.70	343	2.13	110	150	3.1	34.1	60	54
TFM	18S	7.9	11.0	0.142	0.80	377	2.50	200	280	3.6	39.0	66	64
	15S	4.3	5.9	0.146	0.85	343	3.35	110	150	3.7	41.0	60	85
M MA	250	0.8	1.2	0.087	0.49	34	1.38	20	30	2.2	23.9	6	35
	350	1.0	1.4	0.091	0.53	60	1.50	25	35	2.3	25.8	10.5	38
	500	1.4	2.0	0.098	0.55	86	1.63	35	50	2.5	26.8	15	41
	750	2.0	3.0	0.110	0.61	129	1.75	50	75	2.8	29.7	22.5	44
	1000	2.8	3.9	0.118	0.68	171	2.00	70	100	3.0	33.2	30	51
	1500	3.9	5.9	0.138	0.82	257	2.38	100	150	3.5	40.0	45	60
H HA	2000	5.5	7.9	0.157	0.94	343	2.63	140	200	4.0	45.8	60	67
	500	2.0	2.4	0.138	0.78	86	2.25	50	60	3.5	38.0	15	57
	750	2.6	3.0	0.146	0.84	129	2.25	65	75	3.7	41.0	22.5	57
	1000	3.3	3.9	0.157	0.90	171	2.50	85	100	4.0	43.9	30	64
	1500	4.7	5.9	0.177	1.02	257	2.87	120	150	4.5	49.7	45	73
XH	2000	5.9	7.9	0.197	1.15	343	3.13	150	200	5.0	56.1	60	80
	500-3	1.2	2.0	0.118	0.70	86	2.25	30	50	3.0	34.1	15	57
	500-4	1.4	2.4	0.158	0.93	86	2.25	35	60	4.0	45.3	15	57
	500-5	2.2	2.8	0.197	1.40	86	2.25	55	70	5.0	68.3	15	57
	500-6	2.4	3.1	0.236	1.52	86	2.87	60	80	6.0	74.1	15	73
MH	750-6	3.1	3.9	0.236	1.49	129	3.00	80	100	6.0	72.6	22.5	76
	3000	9.4	11.8	0.217	1.23	514	3.86	240	300	5.5	60.0	90	98
	4000	12.6	15.7	0.256	1.43	686	5.24	320	400	6.5	69.7	120	133

Standard Coil Lengths 345 ~ 354 Feet ± 10%

Shaft Load @ 2% ÷ 4 = Tension @ 1%

Covers

Nitta "Polybelt" is available from stock in eight (8) cover thicknesses and fourteen (14) nylon strengths to meet your requirements for power rating, abrasion or wear resistance and pulley diameters for specific applications. The cover designations are as follows: SG (skim coat), L (light), M (medium), H (heavy), and XH (extra heavy). Covers are the same thickness on both sides of the belt. The designation MH indicates a heavy cover on the pulley side, medium cover on the other side. Cover types of L, M and H have one blue side and one black antistatic side. Covers LA, MA, and HA have blue covers on both sides.

Note

Nitta Flat Drive Belts are tested for over 250,000,000 flexes to determine the pulley diameters that will give extremely long trouble free belt life. We refer to these as "Standard" pulley diameters. While using pulley diameters larger than the "Standard" diameters may increase belt life, using pulley diameters smaller than our "Standard" can cause a corresponding loss of belt life. "Minimum" pulley diameters are the diameters a belt will conform to; however, expected belt flex life is lessened. Nitta Flat Drive Belts can be used on pulley diameters any comparative competitive drive belt can be used on, with the strong possibility of receiving longer belt life than would have been received from the competitive belt.

Polybelt–Rubber Covers

APPLICATIONS	SPLICING INFORMATION						BELT TYPE COVER
	Splicing Solutions (see back page)		Press Temperature (Deg F)	Press Temperature (Deg C)	Press Time* (min.)	NYLON TYPE	
	Nylon	Rubber					
Green cover one side, black cover other side. For light and medium duty drives. Tapes for spinning frames, twisters and winders. Printing industry for sheeters, slitters and layboys. Anti-static.	A	A	194-212	90-100	10	250	SG
	A	A	194-212	90-100	15	350	
	A	A	194-212	90-100	15	500	
	A	A	212-230	100-110	15	750	
	A	A	212-230	100-110	15	1000	
Use on two pulley or tangential (serpentine) drives. Excellent for textile applications; open end spinning, winders, texturing, some twisters and doublers. Use on machine tools. Types 250, 350 and 500 excellent for use on collators and folders in printing plants. Anti-static. Type 750 and 1000 excellent for picker equipment.	A	E	194-212	90-100	15	250	L LA
	A	E	194-212	90-100	15	350	
	A	E	212-230	100-110	20	500	
	A	E	212-230	100-110	20	750	
	A	E	212-230	100-110	20	1000	
	A	E	212-230	100-110	20	1500	
A special polybelt construction development for tangential drive applications in the textile industry. Highly energy efficient with a proven power savings of 6 ~ 8% over competitive belts.	A	E	212-230	100-110	30	6S	TFL
	A	E	212-230	100-110	30	7S	
	A	E	212-230	100-110	30	10S	
	A	E	212-230	100-110	30	15S	
	A	E	212-230	100-110	30	20S	
Tangential applications requiring heavy load.	A	E	212-230	100-110	30	15S	TFM
Used on two pulley or serpentine drives. Excellent for textile applications, texturing, open end spinning, twisters and doublers. Excellent for tube winding. Use in flour mills for roll stand and sifter drives. Wood working machine drives; can elevators. Anti-static.	A	E	212-230	100-110	20	250	M MA
	A	E	212-230	100-110	20	350	
	A	E	212-230	100-110	20	500	
	A	E	212-230	100-110	20	750	
	A	E	212-230	100-110	20	1000	
	A	E	212-230	100-110	20	1500	
Used on two pulley or serpentine drives. Excellent for use on primary drives, tube winding, wire drawing and capstan drives, high capacity live roller conveyors. Anti-static.	A	E	212-230	100-110	20	500	H HA
	A	E	212-230	100-110	20	750	
	A	E	212-230	100-110	20	1000	
	A	E	212-230	100-110	20	1500	
	A	E	212-230	100-110	30	2000	
Extra heavy blue covers both sides for use on high wear drives, excellent flexibility. Use for carton and box folding and gluing, tube winding, live roller conveyor. Anti-static.	A	E	212-230	100-110	30	500-3	XH
	A	E	212-230	100-110	30	500-4	
	A	E	212-230	100-110	30	500-5	
	A	E	212-230	100-110	30	500-6	
	A	E	212-230	100-110	30	750-6	
Heavy black cover pulley side, blue cover other side. High duty drives. Primary drives. Paper mill cone drives. Anti-static.	A	E	212-230	100-110	25	3000	MH
	A	E	212-230	100-110	25	4000	

* Starting from heated press

SPECIFICATIONS

NITTA POWER TRANSMISSION BELTING, TEXTILE & MACHINE TAPES

Properties

High strength pre-set nylon core. Select grade high coefficient of friction chrome leather covers on one or both sides of belt. Maximum abrasion and oil resistance.

Excellent for drives with high torque, large variation of loads and high starting loads.

Chemical Resistance

Resistant to Machine Oils, Diesel Fuel, Ethanol, Trichlorethylene, Perchloroethylene, Chlorinated Hydrocarbons.

Not resistant to Methanol, Organic or Inorganic Acids.



State-of-the-art fabrication equipment guarantees perfect joining.

Temperature Range

Continuous	Intermittent
-10 to +60°C	-20 to +70°C
+14 to +140°F	-4 to +158°F

Lesycon-Leather Covered

BELT TYPE COVER	NYLON TYPE	ENGLISH STANDARD						METRIC					
		Minimum Pulley Diameter in.	Standard Pulley Diameter in.	Thick in.	Weight lbs./sq.ft.	Shaft Load @ 2% lbs./in.	Approx. Skive Length in.	Minimum Pulley Diameter mm	Standard Pulley Diameter mm	Thick mm	Weight g/cm.m	Shaft Load @ 2% N/mm	Approx. Skive Length mm
LTA	N5-3P	2.0	3.5	0.098	0.53	93	2.50	50	90	2.5	25.8	16	64
LTB	N10-3P	3.9	6.7	0.138	0.72	187	2.50	100	170	3.5	35.1	33	64
LTB	N15-4P	5.9	9.8	0.157	0.86	280	2.50	150	250	4.0	41.9	49	64
LL	N5-3P	3.0	3.5	0.138	0.70	93	3.25	75	90	3.5	34.1	16	83
	N10-3P	4.7	6.7	0.157	0.80	187	3.25	120	170	4.0	39.0	33	83
	N15-4P	6.7	9.8	0.177	0.94	280	3.25	170	250	4.5	45.8	49	83
	N20-4P	9.8	13.8	0.236	1.21	373	4.75	250	350	6.0	59.0	65	121
	N25-5P	13.8	17.7	0.256	1.35	474	5.12	350	450	6.5	66.0	83	130
	N30-5P	15.2	21.7	0.276	1.47	560	5.50	385	550	7.0	71.7	98	140
	N40-6P	19.3	27.6	0.315	1.72	747	6.25	490	700	8.0	83.9	131	159
	N50-7P	24.4	35.0	0.354	1.97	933	7.00	620	890	9.0	96.0	163	178

Standard Coil Lengths 165 Feet ± 10%

Shaft Load @ 2% ÷ 4 = Tension @ 1%

SPECIFICATIONS

NITTA POWER TRANSMISSION BELTING, TEXTILE & MACHINE TAPES

Note

Nitta Flat Drive Belts are tested for over 250,000,000 flexes to determine the pulley diameters that will give extremely long trouble free belt life. We refer to these as “Standard” pulley diameters.

While using pulley diameters larger than the “Standard” diameters may increase belt life, using pulley diameters smaller than our “Standard” can cause a corresponding loss of belt life. “Minimum” pulley diameters are the smallest diameters a belt will conform to; however, expected belt flex life is lessened.

Nitta Flat Drive Belts can be used on pulley diameters any comparative competitive drive belt can be used on, with the strong possibility of receiving longer belt life than would have been received from the competitive belt.



Lesycon-Leather Covered

APPLICATIONS

Leather drive side, textile other side for two pulley drives. Excellent for textile industry card drives, cone drives, lickerin/doffer drives.

Leather both sides. Use on two pulley straight or crossed drives; serpentine drives. Engineered for high shock or high torque drives up to 5000 HP. Use for primary or secondary drives in flour mills; cone drives in paper mills; wood chippers, rock crushers, rolling mills, or any location requiring an efficient, economical drive belt.

Splicing Solutions (see back page) Lesybond Type		Press Temperature		Press Time* (min)	NYLON TYPE	BELT TYPE COVER
Nylon	Rubber	Deg F	Deg C			
B	A & B	149-167	65-75	5	N5-3P	LTA
B	A & B	149-167	65-75	5	N10-3P	LTB
B	A & B	149-167	65-75	10	N15-4P	LTB
B	A & B	149-167	65-75	5	N5-3P	LL
B	A & B	149-167	65-75	5	N10-3P	
B	A & B	149-167	65-75	10	N15-3P	
B	A & B	149-167	65-75	20	N20-4P	
B	A & B	149-167	65-75	20	N25-5P	
B	A & B	149-167	65-75	30	N30-5P	
B	A & B	149-167	65-75	30	N40-6P	
B	A & B	149-167	65-75	40	N50-7P	

* Do not exceed 176°F

** Starting from heated press

Specifications—Nitta Textile Tapes

TYPE	APPLICATIONS	Minimum Pulley Diameter in.	Thick in.	Weight lbs./sq.ft.	Static Pull 1% elong lbs./in.width	Minimum Pulley Diameter mm	Thick mm	Weight g/cm.m	Static Pull 1% elong N/mm width	TYPE
KSG-250	Spindle tape, medium to heavy package. High coefficient of friction rubber side prevents loss of RPM. Extremely flexible. Non loading, oil resistant. Anti-static.	0.7	0.040	0.18	8.4	18	1.0	8.8	2	KSG-250
KSG-350	For machine spindle clutch or brake. Anti-static.	1	0.047	0.2	14.7	25	1.2	9.8	3	KSG-350
IR-500	Circular knitting machine tape. Superior resistance to oil, wear and cracking. High coefficient of friction, extremely flexible. Use on all filament and spun yarns. Anti-static.	1.4	0.055	0.31	21	36	1.4	15.1	4	IR-500

Specifications—Nitta Machine Tapes

TYPE	APPLICATIONS	Minimum Pulley Diameter in.	Thick in.	Weight lbs./sq.ft.	Static Pull 1% elong lbs./in.width	Minimum Pulley Diameter mm	Thick mm	Weight g/cm.m	Static Pull 1% elong N/mm width	TYPE
TAIR-350	High friction green rubber one side, bare blue textile other side. Excellent for printing machines. Anti-static.	1	0.049	0.25	16.3	25	1.2	12.2	3	TAIR-350
TTA-500	Bare blue textile both sides. Excellent for battery accumulating applications. Strong and flexible.	1.4	0.54	0.26	23.3	35	1.4	12.7	4	TTA-500
TTA-1000		2.8	0.074	0.37	46.7	70	1.9	18.0	8	TTA-1000

Nitta “Starprene” Round Polyurethane Drive Belts

Nitta “Starprene” Round Belts, manufactured in two types, are the answer for light duty power transmission (Type “G”), and conveying (Type “Y”) problems. Made of highly abrasion resistant polyurethane, “Starprene” is easily heat sealed endless, and is an excellent replacement for fractional horsepower V-Belts and double V-Belts on both open and closed drives. Non-marking orange “Starprene Y” is perfect for conveying cans, tiles, glass, plastics, bags or wood products.

Standard installation tension is 5%; however, “Starprene Y” may be installed at tensions of between 3% and 8% depending on type of installation. Drive capacity is almost directly proportional to tension. “Starprene” may be used on standard V-Belt pulleys or on special radius pulleys used for round belts.

Chemicals

“Starprene” is resistant to oils and many chemicals. Do not use when exposed to strong acids, strong alkalis or solvents. If in doubt, please consult our Technical Department.

Temperature Range

-20°F to +140°F

Hardness (Shore A)

“Starprene G”—96 “Starprene Y”—90

Tensile Strength

“Starprene G”—5100 lbs./in.²

“Starprene Y”—4500 lbs./in.²

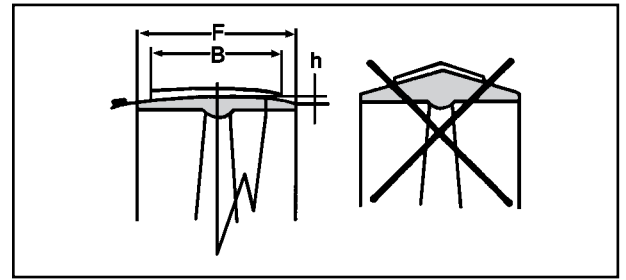
Use for belt speeds up to 4000 ft./min.

TYPE	COLOR	Dia. in.	Nominal Diameter in.	Tensile Strength lbs.	Shaft Load @ 5% Elong. lbs.	Minimum Pulley Diameter in.	Effective Tension @ 5% Elong. lbs.	Length of Roll ft.	Weight oz./ft.	Dia. mm	Tensile Strength kg	Shaft Load @ 5% Elong. kgs	Minimum Pulley Diameter mm	Effective Tension @ 5% Elong. kgs	Length of Roll m	Weight gm/m	TYPE
Y-3	Orange	0.12	1/8	45	2.0	0.81	0.8	654	0.10	3	20	1	20	20	199	9	Y-3
Y-4		0.16	5/32	90	4.0	1.19	1.5	654	0.18	4	40	2	30	38	199	16	Y-4
Y-5		0.20	3/16	130	6.0	1.56	2.2	328	0.27	5	60	3	40	55	100	25	Y-5
Y-6		0.24	1/4	200	8.8	2.00	3.2	328	0.39	6	90	4	50	80	100	36	Y-6
Y-8		0.32	5/16	350	15.9	2.75	5.9	328	0.70	8	160	7	70	150	100	65	Y-8
Y-10		0.39	3/8	550	24.3	3.19	9.2	328	1.04	10	250	11	80	235	100	96	Y-10
G-3	Green	0.12	1/8	55	3.3	0.81	1.2	654	0.10	3	25	1	20	30	199	9	G-3
G-4		0.16	5/32	100	6.0	1.19	2.2	654	0.18	4	45	3	30	55	199	16	G-4
G-5		0.20	3/16	155	8.8	1.56	3.4	328	0.27	5	70	4	40	85	100	25	G-5
G-6		0.24	1/4	220	13.2	2.00	4.9	328	0.39	6	100	6	50	125	100	36	G-6
G-8		0.32	5/16	400	24.3	2.75	9.1	328	0.70	8	180	11	70	230	100	65	G-8
G-10		0.39	3/8	620	37.5	3.19	14.2	328	1.04	10	280	17	80	360	100	96	G-10
G-12	0.47	1/2	894	52.8	4.00	20.5	328	1.51	12	405	24	100	520	100	140	G-12	

Pulleys

For maximum belt life, pulleys used with Nitta flat drive belts should be made of an abrasion resistant material, preferably steel, and should have a smooth slightly rounded surface to conform to the specifications given in Table below. The pulley surface should be fully rounded, with no sharp edges. Standard statically balanced cast iron or steel pulleys can be used for belt speeds to 6000 ft./min. (30 m/s). For belt speed in excess of 6000 ft./min. (30 m/s) use special statically and dynamically balanced ductile iron or steel pulleys.

Shape of Pulley Surface



PULLEY FACE WIDTH (F)	Standard Crown Heights (h) Pulley Diameters (inches)					
	1.2"~6"	6.1"~12"	12.1"~28"	28.1"~40"	40.1"~60"	over 60"
1.2"~5.0"	.031"	.047"	.051"	.067"	.078"	.098"
5.1"~10.3"	.039"	.051"	.059"	.078"	.090"	.110"
10.4"~16.0"	.043"	.055"	.063"	.087"	.098"	.118"
16.1"~over	.047"	.059"	.078"	.098"	.118"	.137"

PULLEY FACE WIDTH (F)	Standard Crown Heights (h) Pulley Diameters (mm)					
	30~150	151~300	301~710	711~1020	1021~1525	over 1525
30~130	0.8	1.2	1.3	1.7	2.0	2.5
131~260	1.0	1.3	1.5	2.0	2.3	2.8
261~410	1.1	1.4	1.6	2.2	2.5	3.0
411~over	1.2	1.5	2.0	2.5	3.0	3.5

Factors to be Considered in Selecting the Proper Nitta Belt for a Drive

- Type of drive and drive conditions: (See service factors, Table 1, Nitta Belt Poly and Lesycon)
 - Straight drive: Poly or Lesycon belt, based on customer preference or drive conditions.
 - Crossed drive: Lesycon
- Pulley diameters: The smallest pulley on the drive, often the drive pulley. (See belt specifications, standard and minimum pulley diameters.) On drives with more than two pulleys, contact our Technical Department.
- Pulley face: The pulley face width should be a minimum of 10% wider than the belt width plus 10mm. For example, for a 200mm wide belt, the pulley should be $200\text{mm} \times 1.10 = 220\text{mm} + 10\text{mm} = 230\text{mm}$ wide minimum.
- Power of drive (kW) $[\text{Hp} \times .74 = \text{kW}]$
- Drive pulley RPM: (To determine belt speed)
Formula:
Belt Speed (V) = Drive pulley diameter x RPM x $5.24 \times 10^5 = \text{m/s}$
- Belt arc of content (θ)
Formula:
Legend D = Large pulley diameter (mm)
d = Small pulley diameter (mm)
CD = Center distance between shafts (mm)
Two pulley straight drive:
 $\theta = 180^\circ - \frac{(D-d) 57.3}{\text{CD}} = \text{Degrees}$
For any other drives measure or estimate closely (always on low side) the arc of contact.
- kW capacity of selected Nitta Belt: Tables 3P (Poly) and 3L (Lesycon) give the power capacity per mm of belt width at 2% tension for all Nitta Flat Drive Belts at belt speeds from 5 to 51 m/s (1,000–10,000 ft/min). For interpolating belt speeds, see instructions. If in doubt, contact our Technical Department.
- Belt length:
If a tape line measurement or belt length for the drive is not available, and if you obtain the pulley diameters and center distance, the following formula may be used.
Straight two pulley drives:
Belt length (L) = $2\text{CD} + 1.57 (D + d) + \frac{(D-d)^2}{4\text{CD}}$ (mm)
Cross drive:
Belt length (L) = $2\text{CD} + 1.57 (D + d) + \frac{(D+d)^2}{4\text{CD}}$ (mm)
- Shaft Load:
To calculate the actual static load ($2T_0$) of a drive, first obtain the shaft load at 2% elongation (N/mm) for the given belt from the belt specifications sheet.
The formula is:
 $2T_0 = \frac{\text{shaft load @ 2\% elongation} \times \text{width of belt (in cm)}}{2}$

Drive Calculation Example

Legend

- d = Small pulley diameter
- D = Large pulley diameter
- CD = Center distance between two pulley shafts
- L = Belt length
- B = Belt width
- RPM = Drive shaft revolutions per minute
- V = Belt Speed
- kW = Kilowatts
- θ = Belt arc of contact
- C_1 = Drive service factor
- C_2 = Arc of contact correction factor
- $2T_o$ = Static shaft load
- Σ = Belt tension

Type of drive, centrifuge. 100kW motor 1200RPM. Drive pulley dia. 500mm, driven pulley dia. 150mm (speed up drive), pulley face widths 200mm, center distance 1800mm. No oil or dust.

1. Select Nitta belt Poly. Referring to the Poly specification sheet, note that the 150mm diameter pulley will be satisfactory for a Nitta type MA-1500 (standard pulley diameter 150mm).
2. From Table 1 (Poly) we determine the service factor (C_1) for a centrifuge is 1.3.
3. Calculate the arc of contact (θ) for the drive, $D = 500\text{mm}$, $d = 150\text{mm}$, $CD = 1800\text{mm}$

$$\theta = 180^\circ - \frac{(D-d)}{CD} 57.3 = 180^\circ - \frac{(500-150)}{1800} 57.3$$

$$\theta = 180^\circ - \frac{350 \times 57.3}{1800} = 180^\circ - 11.14^\circ = 168.86^\circ$$

From Table 2 (C_2) $170^\circ = .96$, $165^\circ = .95$, interpolate on low side to $C_2 = .955$
4. Calculate belt speed (V)

$$V = \frac{3.14 \times D \times \text{RPM}}{60000}$$

$$V = 500 \times 1200 \times (5.2 \times 10^{-6}) = 31.2\text{m/s}$$
5. Belt power capacity

From Table 3P, MA-1500 kW capacity per cm of belt width at 2% tension at 31.2m/s belt speed (interpolate).

MA-1500 @ 35m/s = 7.6 kW/cm
 MA-1500 @ 30m/s = 7.0 kW/cm
 Difference = 0.6 kW/cm

To calculate:

$$\frac{0.6 \times 1.2}{5} = 0.12 \times 1.2 = 0.144 \text{ kW/cm}$$

kW/cm @ 30m/s = 7.0
 Difference for 1.2m/s = 0.144
 Power capacity at 31.2m/s = 7.14kW/cm @2%
6. Calculate belt width (B)

$$B = \frac{\text{Drive power} \times C_1 (\text{service factor})}{\text{Belt kW/cm} \times C_2 (\text{arc of contact})}$$

$$B = \frac{100 \times 1.3}{7.14 \times .955 \times 6.82} = \frac{130}{6.82} = 19.1$$

$$B = 19.1\text{cm} = 191\text{mm}$$

Since the pulley face width is 180mm, it will be necessary to use a narrower belt. Because of the small pulley diameter we cannot use a stronger belt. To obtain greater kW capacity per cm of belt width we must increase the belt tension. The maximum belt width that should be used on an 180mm face width pulley is $B_{\text{max}} = \frac{180\text{mm} - 10\text{mm}}{1.10} = 155\text{mm}$

Drive Calculation Example (continued)

To determine the amount of belt tension required (Σ):

$$\Sigma = \frac{\text{Calculated belt width at 2\%}}{\text{Desired belt width}} \times 2\%$$

$$\Sigma = \frac{191\text{mm}}{155\text{mm}} = 1.23 \quad 1.23 \times 2\% = 2.5\%$$

$$\Sigma = 2.5\% \text{ belt tension}$$

Belt transmitted power capacity at 2% tension = 7.14kW/cm

kW/cm capacity @ 2.5% (2% x 1.25): 7.14 x 1.25 = 8.9kW/cm

$$B = \frac{100 \text{ (kW)} \times 1.3}{8.9 \text{ (kW/cm)} \times 0.955} = \frac{130}{8.5} = 15.3\text{cm} (\leq 15.5\text{cm maximum width})$$

MA-1500, 15.3cm wide at 2.5% elongation

7. Static shaft load ($2T_o$)
 - $2T_o$ @ 2% elongation = 45kgf/cm x 15.3 = 688.5kgf
 - $2T_o$ @ 2.5% elongation = 688.5kgf/cm x 1.25 = 861kgf

DRIVE CALCULATION TABLES

Table 1: Nitta Belt Poly and Lesycon

Operating (Service) Factor (C_1) *For heavy oil conditions we recommend Lesycon Drive Belts.

OPERATING CONDITIONS	Normal	Oil Conditions – C_1	
	Conditions C_1	Poly*	Lesycon
Drives with small variation of load and light start up load. Tools, textile machines, lathes, pumps, wood working machinery, printing conveyors.	1.3	1.5	1.4
Medium duty drives, moderate load surges or shock loads. Large fans or blowers, generators, planing machines, presses, looms, punch presses, small rolling mills, line shafts with clutches.	1.5	1.8	1.7
Heavy duty drives. Large start up loads or heavy shock loads, large pulley ratios, flywheels, etc. High load line shafts, extruders, crushing machines, gang saws, calendars, reciprocation compressors, heavy duty pumps.	1.8	2.2	2.0
Extremely heavy duty drives. Heavy shock loads and large start up loads, iron and steel shears, heavy rolling mills, beating mills, stone crushers.	2.0	2.4	2.2

Table 2

Arc of contact correction factor (C_2)

Arc of Contact Degrees (θ)	180	175	170	165	160	155	150	145	140	135	130	125	120	110	100	90
Contact Correction Factor (C_2)	1.0	.98	.96	.94	.92	.89	.87	.85	.82	.80	.77	.75	.72	.67	.61	.56

Belt Power Capacity

Rubber Covered

Table 3P (Polybelt)

NITTA POLY HORSEPOWER CAPACITY AT 2% TENSION* (per inch of belt width)
INTERPOLATE FOR SPECIFIC BELT SPEEDS (See Instructions)

NITTA BELT POLY**

NYLON TYPE	250		350		500			750			6S	7S	1000			10S	1500			15S	2000			20S	3000	4000
	COVER TYPE		COVER TYPE		COVER TYPE			COVER TYPE					COVER TYPE				COVER TYPE				COVER TYPE					
BELT SPEED (ft/min)	LA	MA	LA	MA	LA	MA	HA	LA	MA	HA	TFL	TFL	LA	MA	HA	TFL	LA	MA	HA	TFL	LA	MA	HA	TFL	MH	MH
1000	0.6	0.6	1.1	0.5	1.6	1.6	1.6	2.3	2.3	2.3	2.4	2.7	3.1	3.1	3.1	4.1	4.7	4.7	4.7	6.3	6.3	6.3	6.3	6.9	9.4	12.6
2000	1.2	1.2	2.1	1.0	3.1	3.0	3.0	4.6	4.6	4.6	4.7	5.3	6.2	6.2	6.1	8.1	9.3	9.3	9.2	12.5	12.4	12.4	12.4	13.7	18.6	24.9
3000	1.7	1.6	3.1	1.5	4.5	4.3	4.2	6.8	6.7	6.5	6.9	7.8	9.1	9.0	8.8	11.9	13.7	13.6	13.5	18.4	18.3	18.3	18.1	20.2	27.5	36.8
4000	2.0	1.7	3.9	1.8	5.7	5.4	5.1	8.7	8.5	8.1	8.9	10.1	11.7	11.5	11.2	15.4	17.8	17.6	17.3	24.1	23.9	23.8	23.4	26.4	35.8	48.1
5000	2.2		4.5	1.9	6.8	6.1	5.5	10.3	9.9	9.2	10.5	12.0	14.0	13.7	13.0	18.7	21.5	21.2	20.5	29.3	29.0	28.7	28.0	32.1	43.4	58.5
6000			4.8		7.5	6.5	5.3	11.5	10.8	9.7	11.9	13.5	15.9	15.3	14.1	21.4	24.6	24.1	23.0	34.1	33.5	33.0	31.8	37.2	50.1	67.8
7000			4.9		8.0	6.3		12.4	11.2		12.7	14.5	17.3	16.3	14.4	23.7	27.2	26.4	24.5	38.2	37.2	36.5	34.6	41.6	55.7	75.8
8000					8.1			12.7			13.1	15.0	18.1	16.7		25.4	29.0	27.9	25.0	41.6	40.2	39.0	36.2	45.2	60.0	82.3
9000											12.9	14.9	18.3			26.3	30.0	28.4		44.2	42.1	40.5	36.5	47.8	62.8	87.1
10000																26.5	30.1			45.8	43.1	40.8		49.3	64.0	90.0

NITTA POLY KILO-WATTS CAPACITY AT 2% TENSION* (per cm of belt width)

NYLON TYPE	250		350		500			750			6S	7S	1000			10S	1500			15S	2000			20S	3000	4000
	COVER TYPE		COVER TYPE		COVER TYPE			COVER TYPE					COVER TYPE				COVER TYPE				COVER TYPE					
BELT SPEED (m/s)	LA	MA	LA	MA	LA	MA	HA	LA	MA	HA	TFL	TFL	LA	MA	HA	TFL	LA	MA	HA	TFL	LA	MA	HA	TFL	MH	MH
5	0.2	0.2	0.3	0.3	0.5	0.5	0.5	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.2	1.4	1.4	1.4	1.8	1.8	1.8	1.8	2.0	2.7	3.6
10	0.3	0.3	0.6	0.6	0.9	0.9	0.9	1.3	1.3	1.3	1.4	1.5	1.8	1.8	1.8	2.3	2.7	2.7	2.7	3.6	3.6	3.6	3.6	4.0	5.4	7.2
15	0.5	0.5	0.9	0.9	1.3	1.3	1.2	2.0	1.9	1.9	2.0	2.3	2.6	2.6	2.6	3.4	4.0	4.0	3.9	5.3	5.3	5.3	5.3	5.9	8.0	10.7
20	0.6	0.5	1.1	1.0	1.7	1.6	1.5	2.5	2.4	2.4	2.6	2.9	3.4	3.3	3.2	4.5	5.2	5.1	5.0	7.0	6.9	6.9	6.8	7.7	10.4	13.9
25	0.6		1.3	1.1	2.0	1.8	1.6	3.0	2.9	2.7	3.1	3.5	4.1	4.0	3.8	5.4	6.2	6.1	5.9	8.5	8.4	8.3	8.1	9.3	12.6	16.9
30			1.4		2.2	1.9	1.5	3.3	3.1	2.8	3.4	3.9	4.6	4.4	4.1	6.2	7.1	7.0	6.6	9.9	9.7	9.6	9.2	10.8	14.5	19.6
35			1.4		2.3	1.8		3.6	3.2		3.7	4.2	5.0	4.7	4.2	6.8	7.8	7.6	7.1	10.9	10.7	10.5	9.9	11.9	16.0	21.7
40					2.3			3.7			3.8	4.3	5.2	4.8		7.3	8.3	8.0	7.2	11.9	11.5	11.2	10.4	13.0	17.2	23.6
45											3.7	4.3	5.3			7.6	8.7	8.2		12.7	12.1	11.7	10.6	13.8	18.1	25.1
50																7.7	8.7			13.2	12.4	11.8		14.2	18.5	26.0

* For best horsepower capacity at 2.5% tension multiply the horse power capacity at 2% by 1.25. For tensions or belt speeds other than shown, contact our Technical Department.

** For type SG use Poly L horsepower capacity and multiply by .85.

Belt Power Capacity

Leather Covered

Table 3L (Lesycon)

**NITTA LESYCON HORSEPOWER CAPACITY AT 2% TENSION* (per inch of belt width)
INTERPOLATE FOR SPECIFIC BELT SPEEDS (See Instructions)**

NITTA TYPES AND COVERS

BELT SPEED (ft/min)	N5-3P		N10-3P		N15-4P		N20-4P	N30-5P	N40-LP	N50-7P
	LTA	LL	LTB	LL	LTB	LL	LL	LL	LL	LL
1000	1.7	1.7	3.5	3.5	5.2	5.2	7.0	10.5	14.0	17.5
2000	3.4	3.4	6.9	6.9	10.4	10.4	13.9	20.9	27.8	34.8
3000	5.1	5.0	10.3	10.3	15.5	15.5	20.6	31.1	41.5	51.9
4000	6.6	6.5	13.5	13.5	20.4	20.4	27.1	41.0	54.8	68.6
5000	8.0	7.8	16.6	16.4	25.1	25.0	33.3	50.7	67.8	84.9
6000	9.3	8.8	19.4	19.1	29.6	29.4	39.1	59.9	80.2	100.6
7000	10.3		21.9	21.5	33.7	33.4	44.4	68.6	92.0	115.6
8000			24.1		37.5	37.0	49.2	76.6	103.0	129.8
9000					40.9		53.4	84.1	113.2	143.0
10000									122.5	155.2

NITTA LESYCON KILO-WATTS CAPACITY AT 2% TENSION* (per cm of belt width)

BELT SPEED (ft/min)	N5-3P		N10-3P		N15-4P		N20-4P	N30-5P	N40-LP	N50-7P
	LTA	LL	LTB	LL	LTB	LL	LL	LL	LL	LL
5	0.5	0.5	1.0	1.0	1.5	1.5	2.0	3.0	4.0	5.0
10	1.0	1.0	2.0	2.0	3.0	3.0	4.0	6.0	8.0	10.0
15	1.5	1.4	3.0	3.0	4.5	4.5	5.9	8.9	11.9	14.8
20	1.9	1.9	4.0	3.9	5.9	5.9	7.7	11.7	15.6	19.4
25	2.4	2.2	4.9	4.8	7.3	7.2	9.4	14.3	19.0	23.6
30	2.8	2.6	5.7	5.6	8.6	8.4	10.8	16.8	22.1	27.5
35	3.1		6.4	6.2	9.6	9.4	12.0	18.7	24.6	30.6
40			7.1		10.7	10.4	13.0	20.6	27.0	33.4
45					11.7		13.8	22.2	28.8	35.7
50									30.2	37.4

* For best horsepower capacity at 2.5% tension, multiply the horse power capacity at 2% by 1.25, for 3% multiply by 1.5. For tensions or belt speeds other than shown, contact our Technical Department.

Interpolation

Example: Belt chosen MA-2000. Belt speed 3572 ft./min.

MA-2000 horsepower capacity per inch of belt width at 2% tension

4000 ft./min. = 23.8 hp

3000 ft./min. = 18.3 hp

Difference = 5.5 hp

Divide the difference by 1000 ($5.5 \div 1000 = .0055$) and multiply by 572 ($3572 \text{ ft./min.} = .0055 \times 572 = 3.15 \text{ hp}$).

Add this to the horsepower capacity at 3000 ft./min.: $18.3 + 3.15 = 21.5 \text{ hp/in. belt width}$ for 3572 ft./min. belt speed at 2% tension. At 2.5% tension it would be $21.5 \text{ hp} \times 1.25 = 26.9 \text{ hp}$.

Endless Procedures

Skiving: You may use any type of skiving or scarfing machine to skive Nitta LESYCON and POLY flat drive belts. Regardless of the type used: disc, drum or band sander, or a very sharp rotary knife skiver; you must carefully skive both belt ends with equal length and angle skives. Depending on the belt type, the length of the skive should be close to that shown on preceding pages. A square 90° splice is satisfactory. An angle of 30° (60° from the belt edge) is commonly used if a diagonal splice is preferred, however the angle of the splice is often dictated by the width of the belt, the length of the skive and the platen size of the belt press being used.

After skiving, if necessary, carefully trim the feathered ends of the belt. Be careful not to trim back so far that ends are blunt. For a smooth, quiet running splice, the ends should be tapered to a fine edge. For LESYCON, rough all chrome leather surfaces with sandpaper or a wire brush. Be very careful not to break the feathered ends.

Matching: Before applying the Nitta bonding solutions, the skived ends of the belt should be matched so that the skived faces of the nylon cores mate perfectly across the face of the belt, and the edges of the belt are square with no "Dog Leg." When sure that the splice is matched and square, draw a line across the belt at the feathered end of the top skive. This will allow you to quickly and surely match the belt ends after applying bonding solutions, and eliminate the possibility of mixing the two solutions.

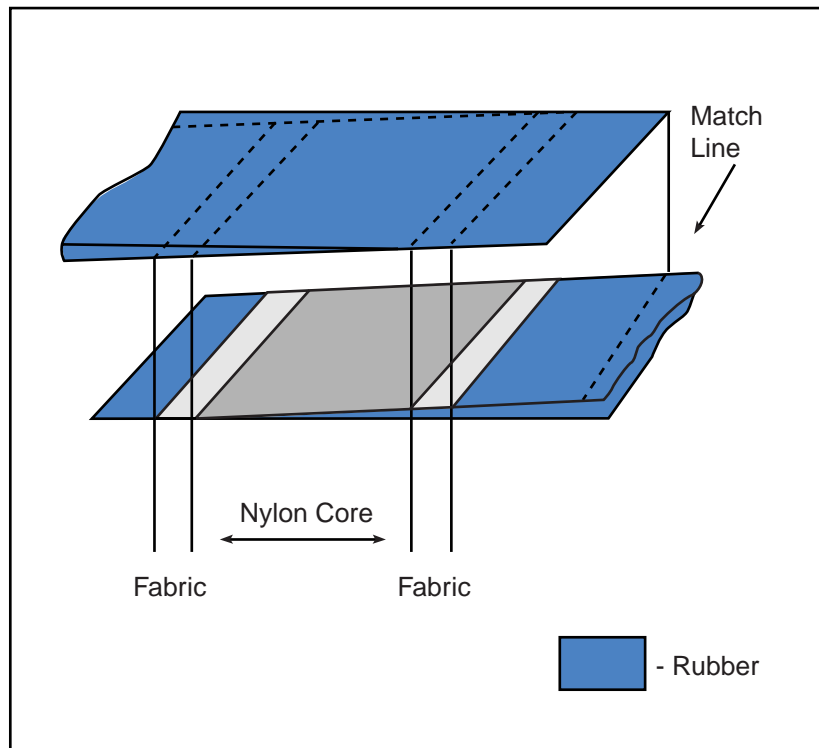
Cleaning: Before applying the bonding solutions, be sure that the skived areas are free of any dirt, grease or oil by cleaning with perchlorethylene, trichlorethylene or alcohol. Allow to dry thoroughly before applying bonding solutions.

Joining Belts Without Rubber Covers: Types "SG, TAIR, TTA, and KSG" belts use only Polybond "A" solution. All other types use Polybond "A" and "E." **Do not use excessive amounts of solutions.** Too much causes a weak bond.

Belts Without Rubber Covers Only: Trim off any feathered edge of the cover. With a brush or spatula, apply a very thin uniform coating of Polybond "A" solution over the entire surface of both

skived belt ends. Allow to dry for approximately 3 minutes (+ or - a variation due to heat and humidity) and place in belt press at 212~230°F for indicated time. (Refer to page 3-6:Textile Tapes)

Belt Types With Rubber Covers: With a brush or spatula, apply a thin uniform coating of Polybond "A" solution to the nylon core and the fabric layer only of both belt ends. Care must be taken not to spread any of the "A" solution on the rubber surfaces. Allow to dry for approximately 3 minutes (+ or - a variation due to heat and humidity). Using a separate brush, apply a thin even coating of Polybond "E" to only rubber surfaces of both skived ends of the belt.



Immediately after applying the Polybond "E" solution to types "LA, TFL, MA, H, XH and MH," place belt ends in press, match belt ends using match-line, clamp ends and tighten press. If using a preheated press (212~230°F), allow belt to remain in press for time indicated in preceding pages. If starting from a cold press, allow enough additional time for the press to reach pressing temperatures. After the indicated press time, the press should be disconnected or turned off, and the belt allowed to cool in the press until it reaches room temperature.

If desired, the belt may be removed from the press while still hot, however extreme care must be taken that the splice is not subjected to bending, twisting or tension. The splice may be cooled by using 1/4" steel plates clamped to each side of splice or by a fan. **DO NOT USE WATER.** After the belt is cool, any rough edges should be sanded smooth.

Solutions: After use, the Polybond "A" solution should be tightly resealed and stored in a cool dark area. Any remaining Polybond "E" solution should be discarded, since once exposed to air it loses its effectiveness.

Belt Press: It is advisable to clean any residue from the press while still hot. Use a spatula or putty knife.

continued next page

Endless Procedures (continued)

Caution: Care must be taken so that Lesybond “B” solution does not get on your skin or clothing. If this occurs, flush with water immediately. Use in a well ventilated area.

“LL” Types: With a brush, apply a thick uniform coat of Lesybond “A” solution to only leather surfaces at both belt ends. Care must be taken not to apply solution “A” to the nylon core of the belt. Allow first coat to dry then apply a second coat of Lesybond “A” to all leather surface only, again allow to dry completely. After “A” solution has dried, using a brush apply a uniform coat of Lesybond “B” solution over both the leather and the nylon surfaces on both belt ends. Brush the “B” solution from the nylon to the leather, rubbing in well. Be sure the “B” solution covers the entire skived area.

Joining Lesycon: For “LT” type belts, apply solutions as on the “LL” types, except coat the nylon textile feathered edge with Lesybond “B” solution only.

Immediately place belt ends in belt press, match ends using match-line, clamp ends and tighten press. If using a preheated press (158~176°F) allow belt to remain in press for time indicated. If using a cold press, allow enough additional time for press to reach proper temperature. After the indicated press time, the press should be disconnected or turned off, and the belt allowed to cool

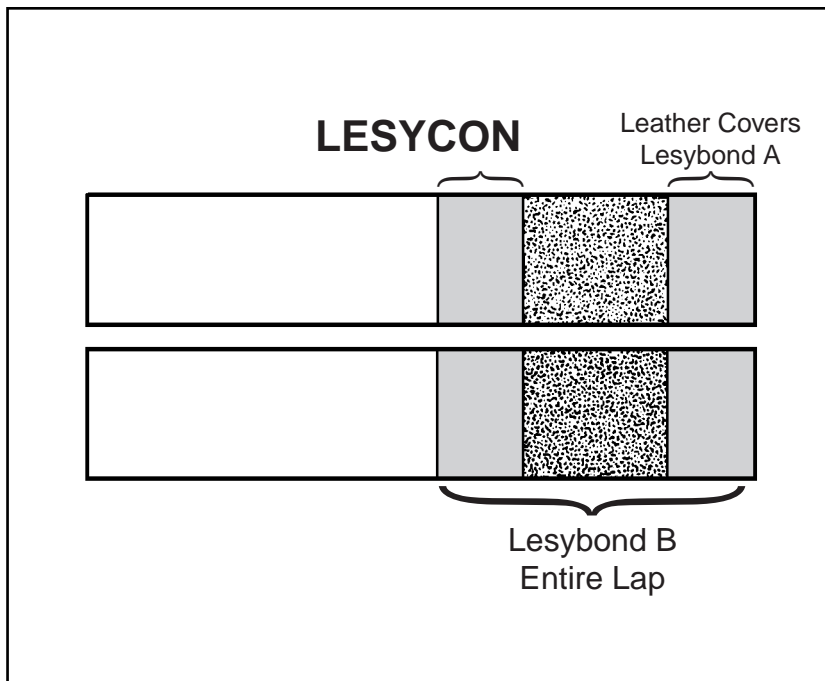
in the press until it reaches room temperature. **DO NOT EXCEED A PRESS TEMPERATURE OF 176°F.**

If desired, the belt may be removed from the press while still hot; however, extreme care must be taken that the splice is not subjected to bending, twisting or tension. The splice may be cooled by using 1/4” steel plates clamped to each side of splice or by a fan. **DO NOT USE WATER.** After the belt is cool, any rough edges should be sanded smooth.

Solutions: After using, tightly re-cap your remaining Lesybond “A” and “B” solutions and store in a cool dark area. **DO NOT REUSE BRUSHES.** Lesybond “A” solution will sometimes solidify when subjected to cold weather. If this occurs, immerse the tightly closed bottle in hot (170~175°F) water until it liquefies.

Belt Press: It is advisable to clean any residue from the press while still hot. Use a spatula or putty knife.

Textile Tapes: For IR-500 and other tapes use Polybond “A” solution only. Skives should be at least 5/8” long. IR-500 press time 10 minutes at 212~230°F. For KSG-250 and SG-250 use 300°F **speed-bonder** for 1 minute maximum.



Notes



Technical Information for Power Transmission Belt Recommendation

From _____ at _____ Date _____

Customer name _____

Recommendation cannot be given if this information is not complete!

1. Drive Pulley Diameter	mm	in	
2. Driven Pulley Diameter	mm	in	
3. Transmitted Power	kW	Hp	
4. Drive Pulley RPM	rpm		
5. Width of Pulleys	mm	in	or #6
6. Width of Belt	mm	in	
7. Center Distance	mm	in	or #8
8. Tape Line Measurement	mm	in	or #9
9. Length of Belt	mm	in	
10. Take Up Stroke	mm	in	

When measuring #7 and #8 with take up, please make certain that stroke is 25% of max.

11. Environment (cool, humid, oily, etc.):

12. Machine Type and Application:

13. Type of belt in use now:

14. Special required function:

15. Pulley Layout (draw below):



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