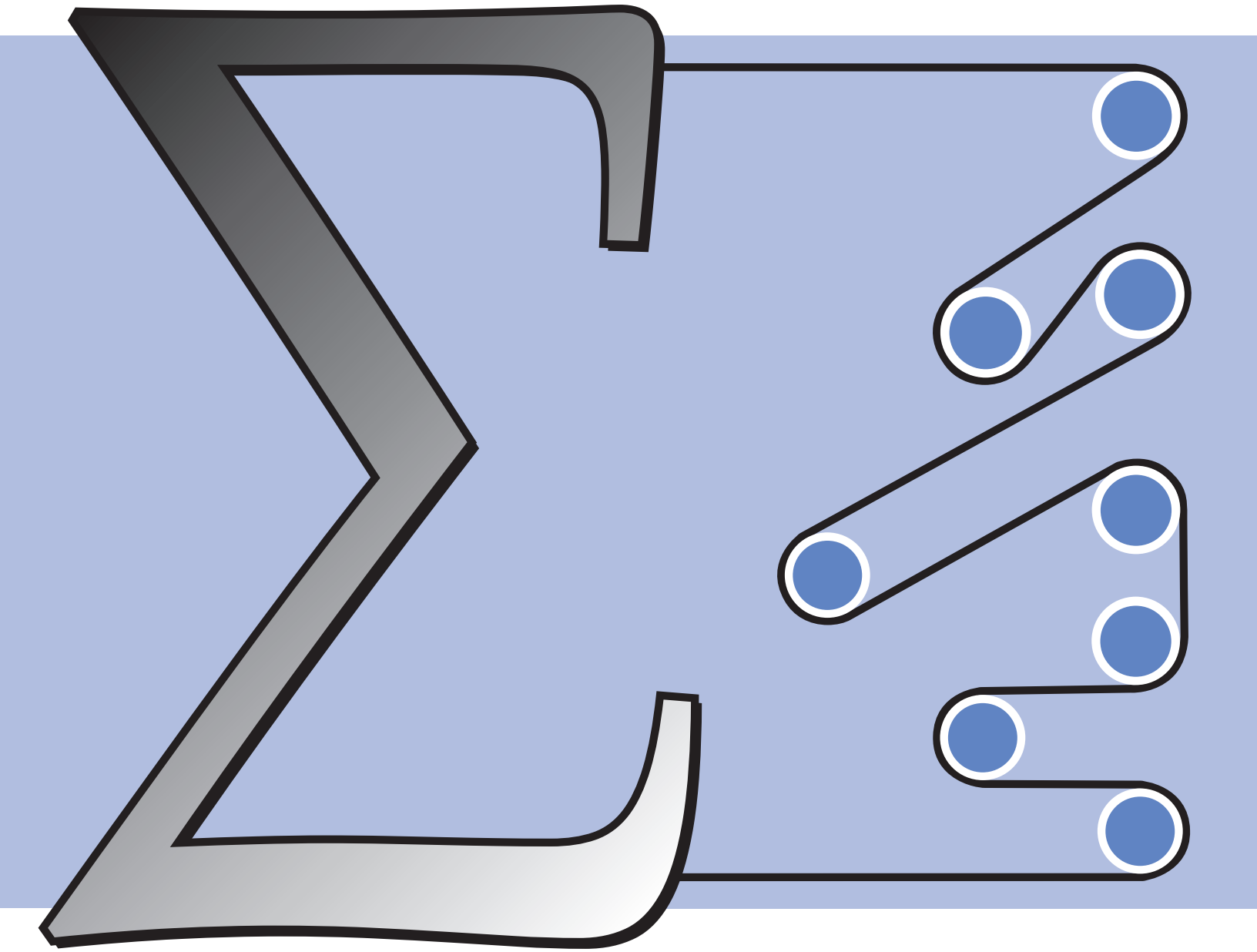
Invention & Innovation
NITTA

U-PT-17

Engineering and Design Manual for

Power Transmission



NITTA CORPORATION OF AMERICA

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, 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

		ENGLISH STANDARD					METRIC				
BELT TYPE COVER	NYLON TYPE	Minimum Pulley Diameter in.	Thick. in.	Weight lbs./sq. ft.	Tension @ 2% lbs./in.	Approx. Skive Length in.	Minimum Pulley Diameter mm	Thick. mm	Weight kg/m²	Tension @ 2% N/mm	Approx. Skive Length mm
SG	250	1.0	0.031	0.16	17	0.55	25	0.8	0.8	3	14
	350	1.4	0.037	0.18	30	0.67	35	0.95	0.9	5.2	17
	500	2.0	0.043	0.23	43	0.79	50	1.1	1.1	7.5	20
	750	3.0	0.053	0.29	64	0.98	75	1.35	1.4	11.2	25
	1000	3.9	0.063	0.35	86	1.18	100	1.6	1.7	15	30
L LA	250	1.0	0.049	0.29	17	0.91	25	1.25	1.4	3	23
	350	1.4	0.055	0.33	30	1.02	35	1.4	1.6	5.2	26
	500	2.0	0.061	0.37	43	1.14	50	1.55	1.8	7.5	29
	750	3.0	0.087	0.51	64	1.65	75	2.2	2.5	11.2	42
	1000	3.9	0.096	0.57	86	1.85	100	2.45	2.8	15	47
	1500	5.9	0.116	0.70	128	2.24	150	2.95	3.4	22.5	57
	2000	7.9	0.136	0.82	171	2.64	200	3.45	4.0	30	67
TFL	3SH	1.4	0.079	0.41	39	1.50	35	2.0	2.0	6.8	38
	6S	2.4	0.089	0.49	66	1.69	60	2.25	2.4	11.5	43
	7S	3.0	0.094	0.53	86	1.81	75	2.4	2.6	15	46
	10S	3.9	0.102	0.57	111	1.97	100	2.6	2.8	19.5	50
	15S	5.9	0.122	0.70	171	2.36	150	3.1	3.4	30	60
	18S	6.9	0.132	0.76	194	2.56	175	3.35	3.7	34	65
TFM	15S	5.9	0.146	0.84	171	2.83	150	3.7	4.1	30	72
M MA	350	1.4	0.093	0.53	30	1.77	35	2.35	2.6	5.2	45
	500	2.0	0.098	0.55	43	1.89	50	2.5	2.7	7.5	48
	750	3.0	0.108	0.61	64	2.09	75	2.75	3.0	11.2	53
	1000	3.9	0.118	0.68	86	2.28	100	3.0	3.3	15	58
	1500	5.9	0.138	0.82	128	2.68	150	3.5	4.0	22.5	68
	2000	7.9	0.157	0.94	171	3.07	200	4.0	4.6	30	78
H HA	500	2.0	0.138	0.78	43	2.68	50	3.5	3.8	7.5	68
	750	3.0	0.148	0.84	64	2.87	75	3.75	4.1	11.2	73
	1000	3.9	0.157	0.90	86	3.07	100	4.0	4.4	15	78
	1500	5.9	0.177	1.02	128	3.46	150	4.5	5.0	22.5	88
	2000	7.9	0.197	1.15	171	3.86	200	5.0	5.6	30	98
XH	500-3	2.0	0.118	0.70	43	2.28	50	3.0	3.4	7.5	58
	500-4	2.4	0.157	0.88	43	3.07	60	4.0	4.3	7.5	78
	500-5	2.8	0.197	1.39	43	3.86	70	5.0	6.8	7.5	98
	500-6	3.1	0.236	1.52	43	4.65	80	6.0	7.4	7.5	118
	750-6	3.5	0.246	1.56	64	4.84	90	6.25	7.6	11.2	123
MH	3000	11.8	0.217	1.33	257	4.25	300	5.5	6.5	45	108
	4000	15.7	0.256	1.56	343	5.04	400	6.5	7.6	60	128

Standard Coil Lengths 345 ~ 354 Feet ± 10%

Shaft Load = 2 X Tension
Tension @ 1% = Tension @ 2% ÷ 2

Covers

Nitta "PolyBelt" is available from stock in eight (8) cover thicknesses and fifteen (15) 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 100,000,000 flexes to determine the pulley diameters that will give extremely long trouble free belt life. We refer to these as "Minimum" pulley diameters. While using pulley diameters larger than the "Minimum" pulley diameters may increase belt life, using pulley diameters smaller than our "Minimum" can cause a corresponding loss of belt life. 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 page 9) Polybond Type		Press Temperature		Press Time*	NYLON TYPE	
	Nylon	Rubber	(Deg F)	(Deg C)	(min.)		
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	30	1000	
	A	E	212-230	100-110	30	1500	
	A	E	212-230	100-110	30	2000	
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	3SH	TFL
	A	E	212-230	100-110	30	6S	
	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	18S	
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	350	M MA
	A	E	212-230	100-110	20	500	
	A	E	212-230	100-110	30	750	
	A	E	212-230	100-110	30	1000	
	A	E	212-230	100-110	30	1500	
	A	E	212-230	100-110	30	2000	
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	30	500	H HA
	A	E	212-230	100-110	30	750	
	A	E	212-230	100-110	30	1000	
	A	E	212-230	100-110	30	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	30	3000	MH
	A	E	212-230	100-110	30	4000	

* Starting from heated press

Specifications – Nitta Textile Tapes

TYPE	APPLICATIONS	Minimum Pulley Diameter in.	Thick. in.	Weight lbs./sq.ft.	Tension @ 1% lbs./in.	Minimum Pulley Diameter mm	Thick. mm	Weight kg/m²	Tension @ 1% N/mm
KSG-250	Spindle tape, med. to hvy. pkg. High coeff. of friction rubber side prevents loss of RPM. Extremely flexible. Non loading, oil resistant. Anti-static.	0.8	0.033	0.16	8.6	20	0.85	0.8	1.5
KSG-350	For machine spindle clutch or brake. Oil resistant. Anti-static.	1.4	0.039	0.18	14.8	35	1.0	0.9	2.6
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.	1.6	0.051	0.31	21.7	40	1.3	1.5	3.8

Specifications – Nitta Machine Tapes

TYPE	APPLICATIONS	Minimum Pulley Diameter in.	Thick. in.	Weight lbs./sq.ft.	Tension @ 1% lbs./in.	Minimum Pulley Diameter mm	Thick. mm	Weight kg/m²	Tension @ 1% N/mm
TAIR-250	High friction green rubber one side, bare blue textile other side. Excellent for printing and book machines. Anti-static.	1.0	0.039	0.23	8.6	25	1.0	1.1	1.5
TAIR-350		1.2	0.045	0.25	14.8	30	1.15	1.2	2.6
TTA-500	Bare blue textile both sides. Excellent for battery accumulating applications. Strong and flexible.	1.6	0.051	0.25	21.7	40	1.3	1.2	3.8
TTA-1000		2.4	0.071	0.35	42.8	60	1.8	1.7	7.5

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 Dept.

Temperature Range

-20°F to +140°F

Hardness (Shore A)

"Starprene G"–87 "Starprene Y"–87

Tensile Strength

"Starprene G"–5100 lbs./in.²

"Starprene Y"–4500 lbs./in.²

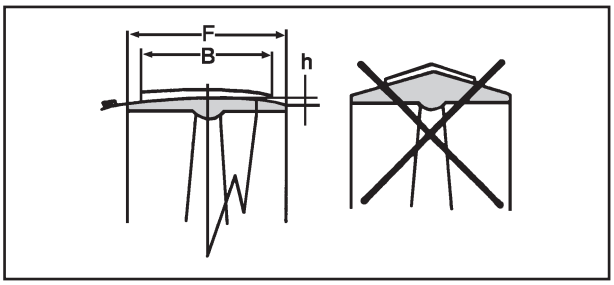
Use for belt speeds up to 4000 ft./min.

TYPE	COLOR	Dia. in.	Nominal Diameter in.	Tensile Strength lb_f	Shaft Load @ 5% Elong. lb_f	Minimum Pulley Diameter in.	Maximum Transmission Force lb_f	Length of Roll ft.	Weight oz./ft.	Dia. mm	Tensile Strength kg_f	Shaft Load @ 5% Elong. kg_f	Minimum Pulley Diameter mm	Maximum Transmission Force kg_f	Length of Roll m	Weight g/m
Y-3	Orange	0.12	1/8	56	3	0.79	1.2	654	0.10	3	26	1.5	20	0.54	200	8
Y-4		0.16	5/32	101	6	1.18	2.3	654	0.16	4	46	2.7	30	1.0	200	15
Y-5		0.20	3/16	157	9	1.57	3.5	328	0.25	5	71	4.1	40	1.6	100	23
Y-6		0.24	1/4	225	14	2.00	5.0	328	0.37	6	102	6.1	50	2.3	100	34
Y-8		0.32	5/16	405	25	2.75	9.2	328	0.63	8	184	11	70	4.2	100	59
Y-10		0.39	3/8	629	38	3.15	14.5	328	1.00	10	286	17	80	6.6	100	93
G-3	Green	0.12	1/8	56	3	0.79	1.2	654	0.10	3	26	1.5	20	0.54	200	8
G-4		0.16	5/32	101	6	1.18	2.3	654	0.16	4	46	2.7	30	1.0	200	15
G-5		0.20	3/16	157	9	1.57	3.5	328	0.25	5	71	4.1	40	1.6	100	23
G-6		0.24	1/4	225	14	2.00	5.0	328	0.37	6	102	6.1	50	2.3	100	34
G-8		0.32	5/16	405	25	2.75	9.2	328	0.63	8	184	11	70	4.2	100	59
G-10		0.39	3/8	629	38	3.15	14.5	328	1.00	10	286	17	80	6.6	100	93

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

1. Type of drive and drive conditions: (See service factors, Table 1, Nitta PolyBelt)
   a. Straight drive
   b. Cross drive
2. Pulley diameters: The smallest pulley on the drive, often the drive pulley. (See belt specifications, minimum pulley diameters.) On drives with more than two pulleys, contact our Technical Department.
3. 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(mm) x 1.10 + 10(mm) = 230(mm) wide minimum.
4. Power of drive (kW) [Hp x .74 = kW]
5. Drive pulley RPM: (To determine belt speed)
   Formula:
   Belt Speed (V) = Drive pulley dia. x RPM x 5.24 x 10^5 = m/s
6. Belt arc of contact (θ)
   Formula:
   Legend D = Large pulley diameter (mm)
   d = Small pulley diameter (mm)
   CD = Center distance between shafts (mm)
   Two pulley straight drive:
   $\theta = 180° - \frac{(D-d)\ 57.3}{CD}$ = Degrees
   For any other drives measure or estimate closely (always on low side) the arc of contact.
7. kW capacity of selected Nitta Belt: Table 3P (PolyBelt) gives 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.
8. 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:
   $$\text{Belt length (L)} = 2CD + 1.57\ (D + d) + \frac{(D-d)^2}{4CD}\ \text{(mm)}$$
   Cross drive:
   $$\text{Belt length (L)} = 2CD + 1.57\ (D + d) + \frac{(D+d)^2}{4CD}\ \text{(mm)}$$
9. Shaft Load:
   To calculate the actual static load (2To) 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:
   $$2To = \text{shaft load @ 2\% x } \frac{\text{elongation \%}}{2} \text{ x width of belt (in cm)}$$

For our Technical Department's assistance with belt selection, please submit a completed copy of the "Technical Information for Power Transmission Belt Recommendation" form (QF:084), available upon request and online at www.nitta.com.

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
- 2To = Static shaft load
- ∑ = 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 PolyBelt. Referring to the PolyBelt specification sheet, note that the 150mm diameter pulley will be satisfactory for a Nitta type MA-1500 (minimum pulley diameter 150mm).
2. From Table 1 (PolyBelt) we determine the service factor (C_1) for a centrifuge is 1.3.
3. Calculate the arc of contact (θ) for the drive, D = 500mm, d = 150mm, CD = 1800mm

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

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

   From Table 2 (C_2) 170° = 0.96, 165° = 0.94, interpolate on low side to C_2 = 0.95
4. Calculate belt speed (V)

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

   $V = 500 \times 1200 \times (5.2 \times 10^{-5}) = 31.2 m/s$
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:

   $\frac{0.6}{(35 - 30)} \times (31.2 - 30) = 0.12 \times 1.2 = 0.144$ 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)

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

   $B = \frac{100 \times 1.3}{7.14 \times 0.95} = \frac{130}{6.78} = 19.2$

   B = 19.2cm = 192mm

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 a 180mm face width pulley is $B_{max} = \frac{180mm - 10mm}{1.10} = 155mm$

Drive Calculation Example (continued)

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

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

$$\sum = \frac{192\text{mm}}{155\text{mm}} = 1.24 \quad 1.24 \times 2\% = 2.5\%$$

∑ = 2.5% 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 (2To)
   2To @ 2% elongation = 45kgf/cm x 15.3 = 688.5kgf
   2To @ 2.5% elongation = 688.5kgf/cm x 1.25 = 861kgf

DRIVE CALCULATION TABLES

Table 1: Nitta PolyBelt™

Operating (Service) Factor (C_1)

OPERATING CONDITIONS	Normal Conditions C_1	Oily Conditions C_1
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
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
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
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

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

Table 3P (PolyBelt™)

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

NITTA POLYBELT**

NYLON TYPE	250		350		500			750			6S	7S	1000			10S	1500			15S	2000			20S	3000	4000
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 POLYBELT KILOWATTS 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	**		**		**			**					**													
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 horsepower capacity at 2% by 1.25. For tensions or belt speeds other than shown, contact our Technical Department.
** For type SG use PolyBelt L horsepower capacity and multiply by .85.

Interpolation

Example:
Belt chosen MA-2000. Belt speed 3572 ft./min.
MA-2000 horsepower capacity per inch of belt width at 2% tension.

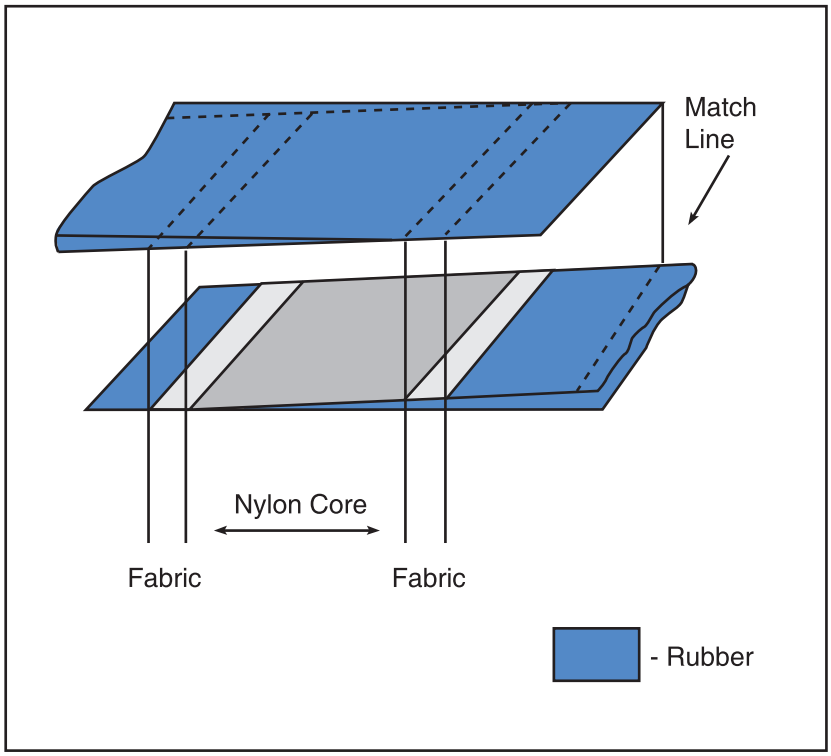
4000 ft./min. = 23.8 hp
3000 ft./min. = 18.3 hp
Difference = 5.5 hp

Divide the difference by 1000 (5.5 ÷ 1000 = .0055) and multiply by 572 (3572 ft./min. = .0055 x 572 = 3.15 hp). Add this to the horsepower capacity at 3000 ft./min.: 18.3 + 3.15 = 21.5 hp/in. belt width for 3572 ft./min. belt speed at 2% tension. At 2.5% tension it would be 21.5 hp x 1.25 = 26.9 hp.

Endless Procedures

Skiving: You may use any type of skiving or scarfing machine to skive Nitta PolyBelt 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 belt type, the length of the skive should be close to that shown on page 2. 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 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. 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, trichloroethylene 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. (Use only with belt types "SG, TAIR, TTA, and KSG.")

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 on page 3. 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 temp.

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.

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

Notes

NITTA CORPORATION OF AMERICA

7605 Nitta Drive • Suwanee, GA 30024
Toll-free: 1-800-221-3689 • Phone: 770-497-0212
Fax: 770-623-1398 • **www.nitta.com**

NITTA CORPORATION

4-4-26 Sakuragawa
Naniwa-ku, Osaka 556-0022 Japan
Phone: +81-6-6563-1211 • Fax: +81-6-6563-1212
www.nitta.co.jp

CONNECT CONVEYOR BELTING INC.

405 Industrial Drive, Unit 3-8
Milton, Ontario, Canada L9T 5B1
Phone: +1-905-878-5552 • Fax: +1-905-878-0344
www.connectbelting.com

NITTA CORPORATION OF HOLLAND B.V.

Berenkoog 25
1822 BH Alkmaar, The Netherlands
Phone: +31-72-562-2234 • Fax: +31-72-561-3238
www.nitta.nl

TAIWAN NITTA FILTER CO., LTD

Chia Hsin Building, 10FL, Room No. 1005
96 Chung Shan North Road Section 2
Taipei, Taiwan, R.O.C.
Phone: +886-2-2581-6296
Fax: +886-2-2563-4900 • **www.nitta.com.tw**

NITTA (SHANGHAI) MANAGEMENT CO., LTD

Room 2705, Shenggao International Building
No.137 Xianxia Road, Shanghai 200051, China
Phone: +86-21-62296000
Fax: +86-21-62299606
www.nitta-cn.com

NITTA BRAZIL

Rua Francisco Mommenshon, 50B, Galpão 02
Laranjeiras, Caieiras, São Paulo, Brazil
Phone/Fax: +55-11-4441-2922
www.nitta.com.br

NITTA INDUSTRIES EUROPE GmbH

Hansaallee 201
40549 Düsseldorf, Germany
Phone: +49-211-537535-0
Fax: +49-211-537535-35
www.nitta.de

NITTA CORPORATION OF SINGAPORE PTE LTD

120 Lower Delta Road, #05-07/08
Cendex Centre, Singapore 169208
Phone: +65-6438-8738 • Fax: +65-6438-8793

NITTA CORPORATION INDIA PVT LTD

Gat No. 186, Village Fulgaon
Taluka Haveli, Pune, Maharashtra 412216, India
Phone: +91-20-6731-3400
Fax: +91-20-6731-3401 • **www.nitta.co.in**

NITTA CORPORATION KOREA OFFICE

Room 710, 7F, Shinhan DM Bldg.
Mapo-daero 25, Mapo-gu, Seoul, Korea
Phone: +82-2-3274-1252 • Fax: +82-2-3274-1253
www.nitta.kr

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