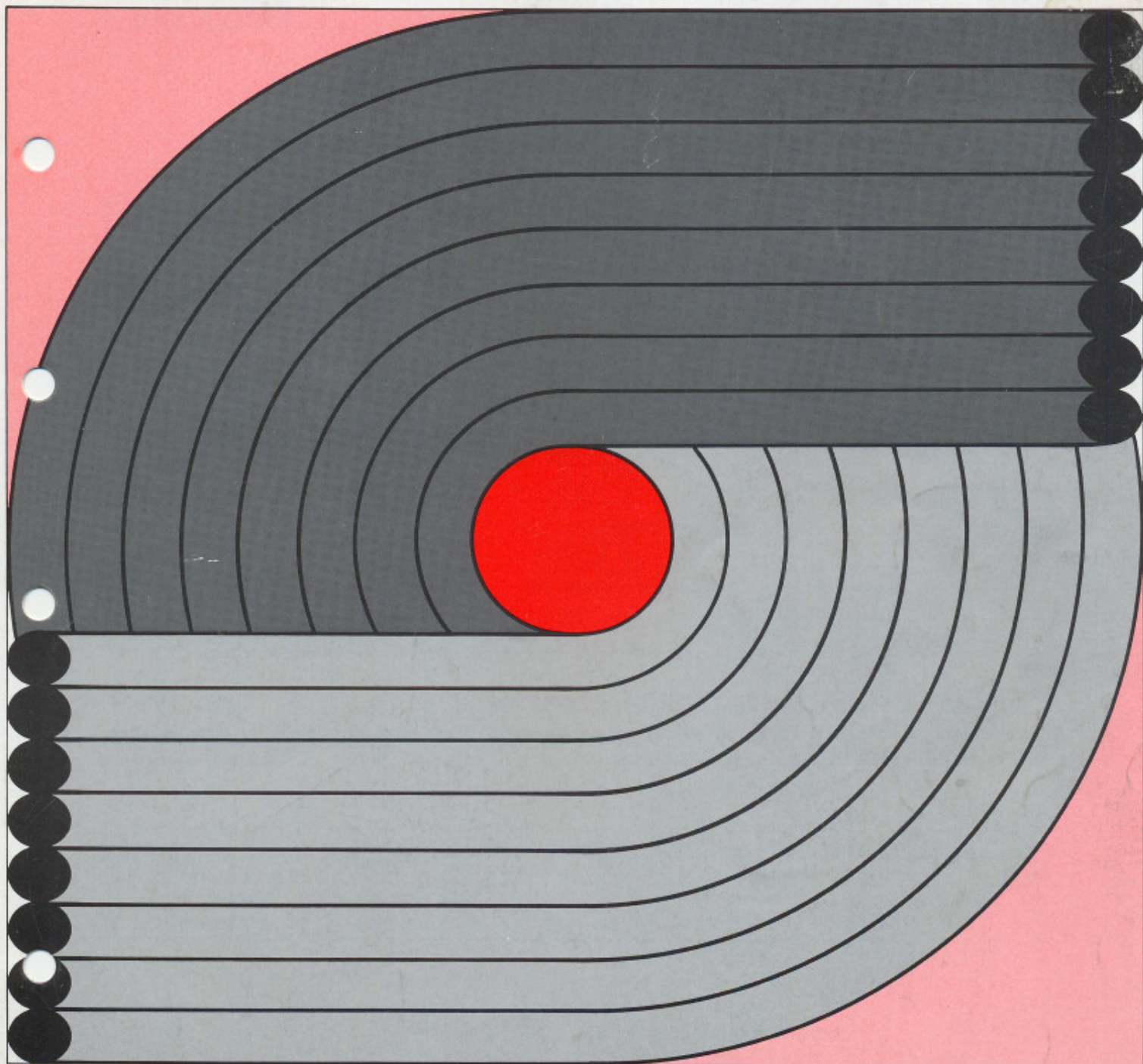


BANDO BANCORD
POLYURETHANE
OPEN-END ROUND
BELT DESIGN MANUAL



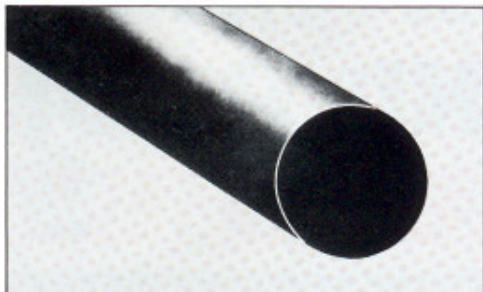
1985. JUNE

T-RB-DM-003-001(E)

BANDO Polyurethane Open-End Round Belt (BANCORD)

Features

Fits to any application, including three dimensional drives, by simply cutting the belt to the required length and heat-splicing the ends.



Standard sizes

Diameter of belt	mm	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	inch	0.08	0.10	0.12	0.16	0.20	0.24	0.28	0.31	0.35	0.39	0.43	0.47
Standard make-up per roll		200m (656 feet)						100m (328 feet)					

Construction

Polyurethane without tensile members

Physical Properties

	Compound No.480 (Orange)	No.489 (White)
Shore Hardness	A 80 Degrees	A 90 Degrees
Specific Gravity	1.23	1.23
Tensile Strength at Breaking Point	350 Kg/sq. cm. (Minimum)	350 Kg/sq. cm. (Minimum)
Elongation at Breaking Point	450 % (Minimum)	400 % (Minimum)
Melting Point	225 C. Degrees	225 C. Degrees

Tensile Strength at Breaking Point

Belt Diameter	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10 mm
Tensile Strength	11	17	25	44	68	100	135	175	225	275 Kg/pc
Belt Diameter	11	12 mm								
Tensile Strength	330	395 Kg/pc								

How to determine a spliced round belt length

A spliced round belt has to be put on the pulleys after it is elongated by 3 – 7% (generally by 5%). Therefore, the right belt length has to be calculated with the formula given below.

$$L = 2C + 1.57(Dp + dp) + (Dp - dp)^2 / 4C \text{ (mm)}$$

$$L' = L \times 0.95 \text{ (mm)}$$

L: Belt length without being stretched/elongated

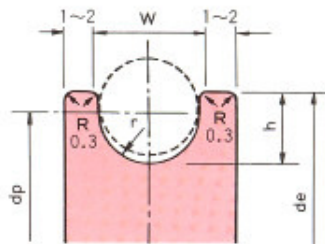
L': Belt length after being put on the pulleys (after stretch).

Dp: Large Pulley Pitch Dia. (mm)

dp: Small Pulley Pitch Dia. (mm)

C: Axes Distance (mm)

Pulley Dimensions for BANCORD



Belt Dia. φ (mm)	W ± 0,1 (mm)	h ± 0,1 - 0 (mm)	r ± 0,05 (mm)	Minimum Pulley Dia. (mm)	
				No. 480	No. 489
2	2,20	1,33	0,90	15	17
2,5	2,70	1,66	1,15	18	20,5
3	3,20	2,00	1,40	20	23
4	4,20	2,66	1,97	25	29
5	5,20	3,33	2,47	35	40
6	6,20	4,00	2,93	40	46
7	7,20	4,66	3,42	45	52
8	8,20	5,33	3,92	55	63
9	9,20	6,00	4,40	60	69
10	10,20	6,66	4,90	70	80
11	11,20	7,33	5,40	80	91
12	12,20	8,00	5,90	95	107

$$W = D + 0.2$$

$$h = \frac{2}{3} \times D$$

$$r = \frac{1}{2}(D - a)$$

$$D = \text{Belt Dia. (mm)}$$

$$a = \text{Correction Factor}$$

D (mm)	a
2 - 3	0.20
4 - 5	0.25
6 - 8	0.35
9 - 12	0.40

$$\text{Pulley Pitch Dia.} = \text{Outside Dia. (de)} - 2h + 2r$$

How to determine the right belt diameter

The right belt diameter has to be determined in accordance with Power Rating as follow. The power rating has to be corrected with the correction factor as follow which varies depending on the arc of belt contact to the small pulley.

Power Rating for 180 Degrees Arc of Contact (Watt)

		No.480 (Orange)												No.489 (White)					
Belt Dia.		2	3	4	5	6	7	8	9	10	11	12	2	4	6	8	10	12	
Belt Speed (Metre/Second)	2	1	3	5	9	12	17	22	28	34	41	49	4	17	37	66	104	149	
	4	3	6	10	16	23	32	42	53	65	79	94	8	33	73	131	204	294	
	6	4	8	14	22	32	44	57	73	90	108	129	12	48	107	191	298	429	
	8	4	9	17	26	38	51	67	85	105	126	151	15	61	138	245	383	551	
	10	4	10	17	26	39	53	68	87	107	129	154	18	72	164	291	454	654	
	12	4	8	15	23	34	46	60	76	94	112	134	20	81	184	326	510	734	
	14												22	87	197	350	547	786	
	16												22	89	203	359	561	806	
	18												22	87	199	351	551	789	
	20												20	80	185	325	511	731	

Correction Factor

	Arc of Contact $\theta = 180 - 57(D_p - dp)/C$ (Degrees)							
$(D_p - dp)/C$	0.00	0.20	0.40	0.60	0.80	1.00	1.20	1.40
θ (Degrees)	180	169	157	145	133	120	106	91
Correction Factor	1.00	0.97	0.94	0.91	0.87	0.82	0.77	0.70

Belt Speed

$$V = \frac{3.14 \times d_p \times n}{60000}$$

V: Belt Speed (Metre/Second)

d_p: Driving Pulley Pitch Dia.

n: Driving Pulley r.p.m.

How to splice BANCORD Round Belting

- 1) After calculating L' , cut the round belting so as to have the cross section positioned at 90 degrees angle to the belt line.

If the belt is cut too longer than L' , it tends to slip in the pulley groove. If too shorter, its service life is shorter than expected.

- 2) Put the both cut-ends of the belt on the heating plate with light force. They start melting in the time specified below, after they are put on the heating plate.

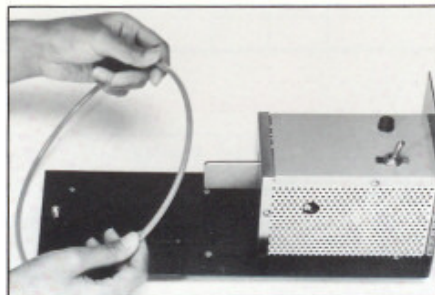
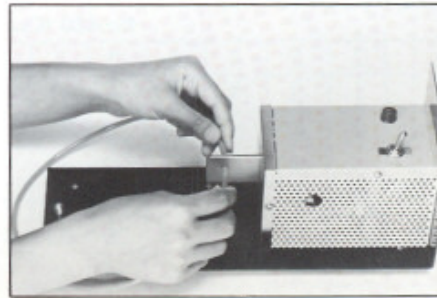
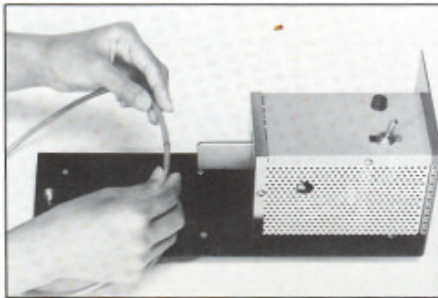
Standard Temperature of Heating Plate: 240 ± 10 Degrees C.

Belt Dia.	2 – 5mm	6 – 10mm	11 – 12mm
No.480 (Orange)	20	50	70 seconds
No.489 (White)	40	60	90 "

- 3) After the both cut-ends are melted, bump slightly each other. They should be matched perfectly.
- 4) Keep them stick together for 1 – 2 minutes until the melted cut-ends are cooled down and return to the original condition.
- 5) Finish the spliced part with a grinder, or a pair of nippers etc.

An electric splicer (DX-77) is available, and can be adjusted to Voltage of Electricity available in each country.

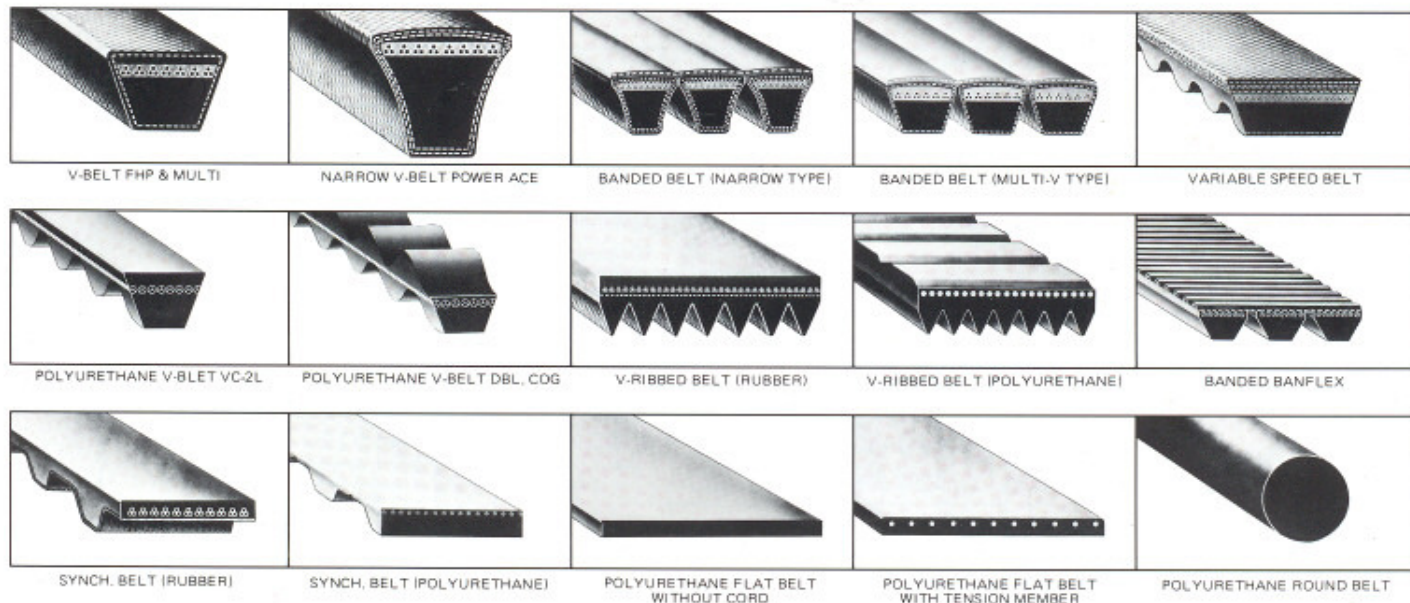
Do not melt the cut-ends of the round belt with flame of a candle or a cigarette lighter etc.



Design Factors of BANCORD (SPLICED)

Machine type													
Service factor	1.0 2.3	1.1 2.4	1.2 2.5	1.3 2.6	1.4 2.7	1.5 2.8	1.6 2.9	1.7 3.0	1.8	1.9	2.0	2.1	2.2
Type of drive	Motor	Engine	Normal: Max:		(PS, KW, kg-m, kg-cm)								
Transmission characteristics	Horsepower constant				Torque constant				Operating hour: (hrs.)				
Spring Force	Max.				Min.				Pulley arrangement Describe (Separately if detail are required.)				
DriveN pulley	Outer dia. (mm) x				(r.p.m.)								
	Pitch dia.												
DriveR pulley	Max. (mm) x				(r.p.m.)								
	Min.												
Velocity Ratio:	Max.												
	Min.												
Center distance					± (mm)								

Abrupt stop	Abrupt stop	Brake:	Time from sudden stop to sudden start or vice versa. (sec)
	Yes No	Input side Output side	GD ² : (kg-m-sec ²)
Pulley space	Any restriction:		
Special requirement (Circle relevant categories and describe in details if necessary.)	Heatproof, Oilproof, Coldproof, Weatherproof, Low noise, Static conductivity, Insulation, Others (Speed-up, Compactness, Vibration Non-slip, Light weight etc.) Details		
Belt Service Life desired.	(hrs.)	Service condition: outdoor, dusty, others	
General Informations of Belts used at present	Maker: Total quantity: Belt life:		Type: Quantity by size: Any problem:



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