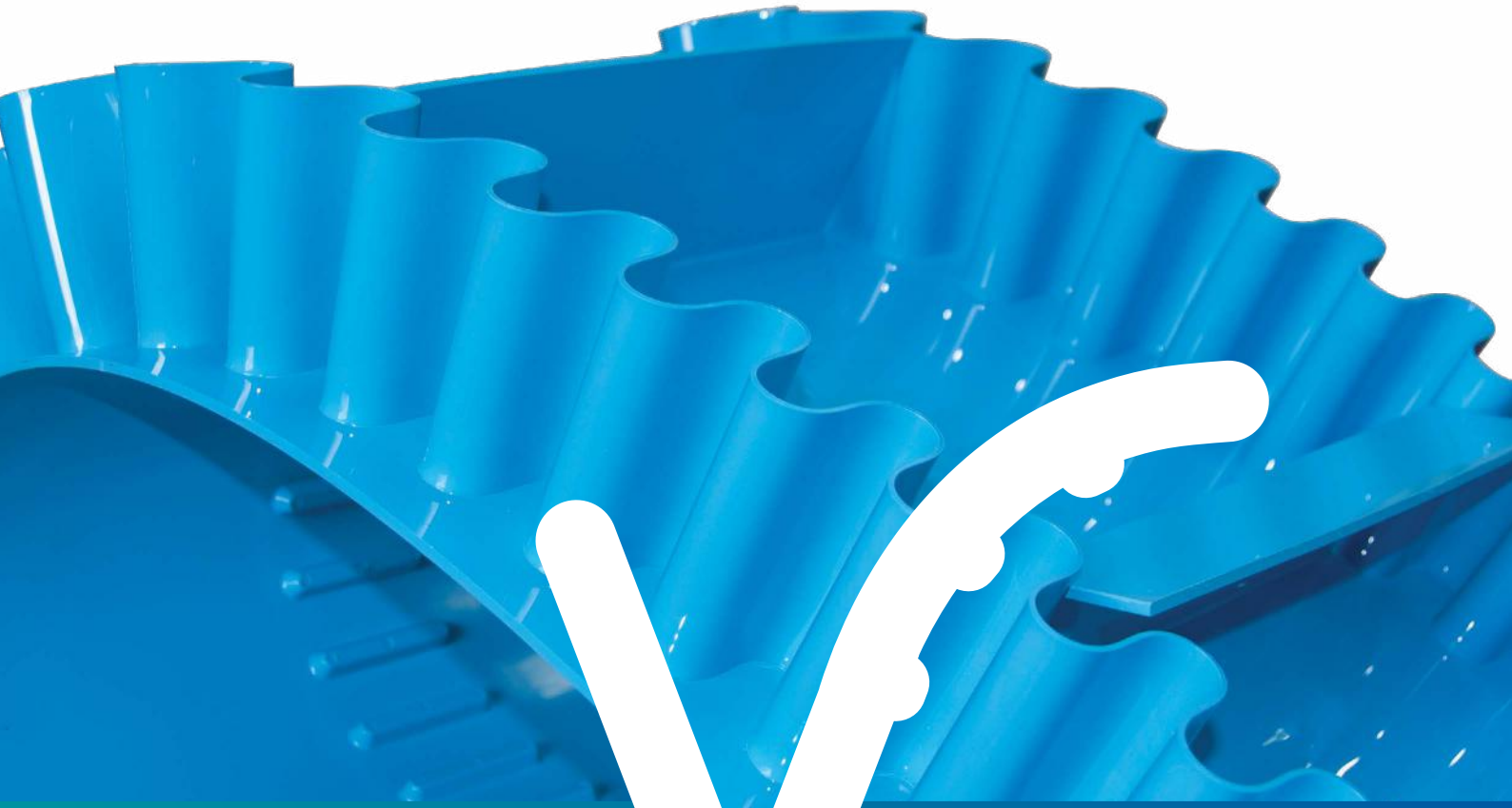
volta™
Belting Technology

The Next Step in Belting



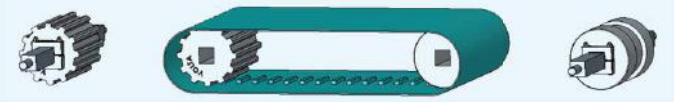
SuperDrive™ and Mini SuperDrive™

Technical Manual

Table of Contents

1. Introduction

SuperDrive™ and Mini SuperDrive™, the homogeneous positive drive belts, globally recognized as the best choice where hygiene control and conveying efficiency are essential. This distinctive design combines positive drive benefits with Volta's firm commitment to superior quality, increasing hygiene standards and productivity.



SuperDrive™ and Mini SuperDrive™ components

Fully extruded integrated teeth on the drive side function as a positive drive system and simultaneously serve as a built in guide mechanism reducing tensioning and off-tracking.The homogeneous character makes sure that there are no crevices where bacteria may harbor making cleaning simple and increasing product life considerably. Volta's eco - friendly belts allow drastic reduction in water usage and converts cleaning time to precious production time.

Material Features

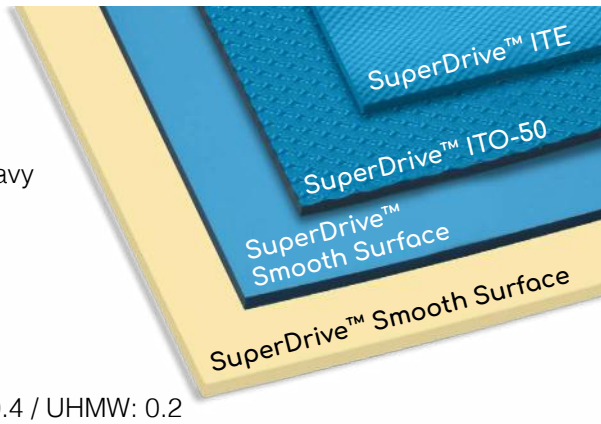
- Smooth homogenous non-porous surfaces prevent bacteria build-up resulting in maximum product shelf-life.
- No plies, edge fraying, modular components or hinges that can break apart and find their way into the final product as foreign bodies.
- Non absorbent of water, oils or chemicals.
- Smooth surface prevents product sticking, considerably reducing waste.
- Does not harbor odors.
- Wide operating temperature range.
- USDA Equipment Acceptance.
- In compliance with USDA Dairy Equipment Review Guidelines.
- Declaration of Conformity in compliance with Food Contact Regulations: EU No.-10/2011, 1935/2004, 2023/2006 and relevant amendments.
  Complies with the Requirements of Code of Federal Regulations (CFR21) USDA FDA article 21 CFR 177.2600.
- Supports the HACCP concept.

Mechanical Benefits

- Teeth are an integral part of the belt, eliminating the chance of detachment.
- Extruded teeth and pulley system positively drive and track the belt, creating a smooth running production line.
- Minimal pre-tension reduces strain on the belt and prevents elongation.
- Reduces noise levels to a minimum.
- Easy to install and provides a strong base for quality heat welded and HF welded fabrications.
- Lightweight conveyor belt, cutting back on motor energy usage.

2. Technical Data - SuperDrive™

'H' Material SuperDrive™ Belts



FHW-SD and FHB-SD are designed for long conveyors with particularly heavy loads and for use in harsh chemical conditions.
The 4mm and the 6mm are suited for cutting and chopping on the belt.

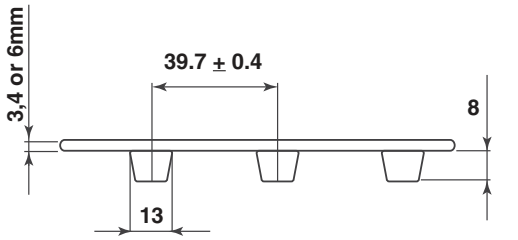
- **Material:** Volta HW, Off-White / Volta HB, Blue16
- **Shore Hardness:** 55D
- **Temperature Range** (see Table 8b)*: -20°C to 90°C/-5°F to 194°F
- **Coefficient of Friction Smooth Bottom Belts:** Steel & Stainless Steel: 0.4 / UHMW: 0.2
- **Coefficient of Friction Embossed Bottom Belts:** Steel & Stainless Steel: 0.32 / UHMW: 0.18
- **Certification:** FDA/ USDA/ USDA Dairy/ EU Approved

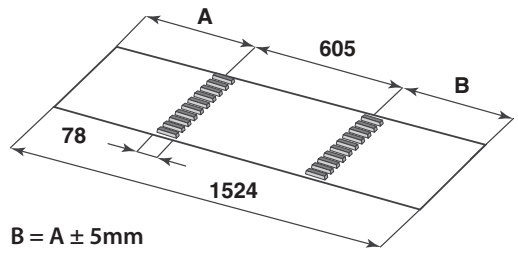
*According to "Temperature Correction Factor" from Table 8b. Page 41.

Table 2.a

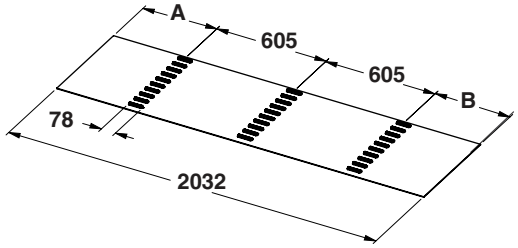
Product		FHB-3-SD FHW-3-SD FEHB-3-SD-ITM2	FHB-3-SD ITE	FHB-3-SD ITO-50	FHB-4-SD FHW-4-SD FEHB-4-SD-ITM2	FHB-4-SD ITO-50	FHB-6-SD
Belt Thickness		3	3	3	4	4	6
Belt weight (kg/ m²) Add for each row of teeth		3.6 kg/ m² + 0.180 kg/ m	3.6 kg/ m² + 0.180 kg/ m	3.5 kg/ m² + 0.180 kg/ m	4.8 kg/ m² + 0.180 kg/ m	4.5 kg/ m² + 0.180 kg/ m	7.2 k g/ m² + 0.180 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth		0.74 lb/ ft² + 0.121 lb/ ft	0.74 lb/ ft² + 0.121 lb/ ft	0.71 lb/ ft² + 0.121 lb/ ft	0.98 lb/ ft² + 0.121 lb/ ft	0.92 lb/ ft² + 0.121 lb/ ft	1.48 lb/ ft² + 0.121 lb/ ft
Belt Min. Pulley Diameter *(normal flex)	**Temp ≥ 0°C/32°F**	126 mm / 4.96"			176 mm / 6.93"		300 mm / 11.81"
	Temp < 0°C/32°F	150 mm / 5.9"			210 mm / 8.27"		340 mm / 13.38"
Belt Min. Pulley Diameter *(back flex)	**Temp ≥ 0°C/32°F**	189 mm / 7.44"			264 mm / 10.39"		
	Temp < 0°C/32°F	225mm / 8.86"			315 mm / 12.4"		
Max. pull force (kg/ cm width)		7			9		14
Max. pull force (lb/ in. width)		39.2			50.4		78.4

Note: FEHB-SD-ITM2 belt is available in 1524mm/60" only. 6mm material SuperDrive™ belts are usually used in heavy load applications and therefore we recommend using the largest Drive Pulleys possible to ensure maximum engagement between belt and Drive Pulley teeth.
*All inch sizes have been converted from metric sizes.





B = A ± 5mm



Base Belt Thickness: 3,4 or 6mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm
Standard width: - 2 rows of teeth = 1524mm / 60″
- 3 rows of teeth* = 2032mm / 80″
Max. belt width with one row of teeth: 910mm / 35.8″
Min. belt width with two rows of teeth: 800mm / 31.5″
Distance between teeth rows, center to center: 605 ±2mm / 24.13 ±0.08″
Tooth Length: 78mm / 3.07″

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Note: *Please contact Volta Belting representative for additional information.

Pulley Guidelines & Fabrication Options

Table 2.b

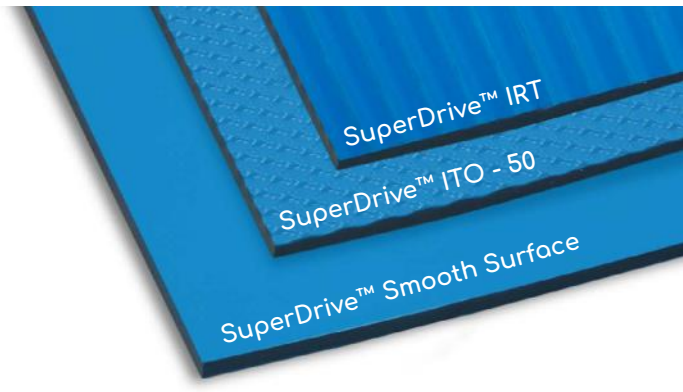
Belt Type	FHB-3-SD / FHW-3-SD / FHB-3-SD-ITE / FHB-3-SD-ITO50 / FEHB-3-SD-ITM2		FHB-4-SD / FHW-4-SD / FHB-4-SD-ITO50 / FEHB-4-SD-ITM2	
Temperature	**Temp ≥ 0°C/32°F**	**Temp < 0°C/32°F**	**Temp ≥ 0°C/32°F**	**Temp < 0°C/32°F**
MPD Base Belt	126mm / 4.96"	150mm / 5.9"	176mm / 6.93"	210mm /8.27"
Minimum Pulley Diameter for V-Flights				
Electrode	158mm / 6.22"	182mm / 7.16"	191mm / 7.52"	225mm / 8.85"
VW/VWB-10	183mm / 7.20"	207mm / 8.15"	211mm / 8.30"	245mm / 9.64"
VW/VWB-13	203mm / 7.99"	227mm / 8.93"	236mm / 9.29"	270mm / 10.62"
VW/VWB-17	243mm / 9.56"	267mm / 10.51"	276mm / 10.86"	310mm / 12.2"
Minimum Pulley Diameter for Electrode Welded Flights				
Single Electrode 7	183mm / 7.20"	207mm / 8.15"	216mm / 8.50"	250mm / 9.84"
Single Electrode 9	203mm / 7.99"	227mm / 8.93"	236mm / 9.29"	270mm / 10.62"
Double Electrode 7	218mm / 8.58"	242mm / 9.52"	251mm / 9.88"	285mm / 11.22"
Double Electrode 9	NR		NR	

All inch sizes have been converted from metric sizes.

Note: NR - Not Recommended.
Contact Volta Belting representative for further details regarding the 6mm thick SuperDrive™ belt.

- **Pulleys:** must be equal to, or larger than the minimum pulley specification.
- **Flights:** should be welded between the teeth as indicated in the sketch on Page 16. Can be welded over the teeth if they do not exceed the tooth width. Must not be welded next to the teeth as indicated in the sketch.

‘DR’ Material SuperDrive™ Belts



DR family belts have excellent hydrolysis resistant properties. Specially recommended for applications where the belts are exposed to a variety of chemicals.

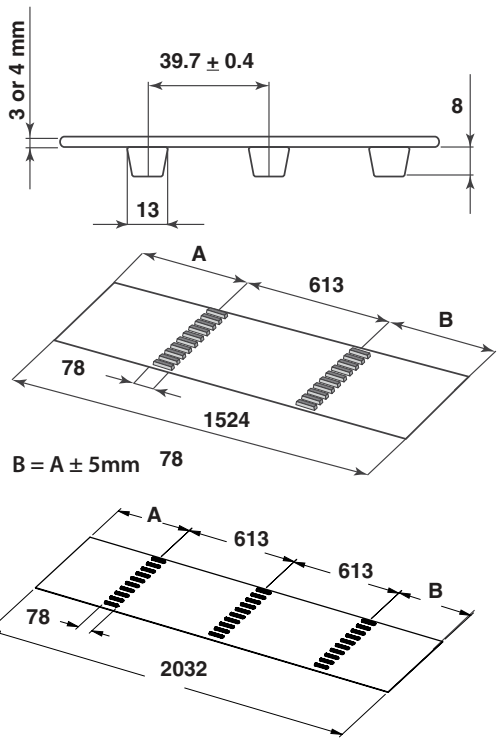
- **Material:** Volta DR, Blue15
- **Shore Hardness:** 53D
- **Temperature Range** (see Table 8b)*: -20°C to 70°C/-5°F to 158°F
- **Coefficient of Friction Smooth Bottom Belt:** Steel & Stainless Steel: 0.55 / UHMW: 0.28
- **Coefficient of Friction Embossed Bottom Belt:** Steel & Stainless Steel: 0.38 / UHMW: 0.22
- **Certification:** FDA/ USDA/ EU Approved

*According to "Temperature Correction Factor" from Table 8b. Page 41.

Table 2.c

Product	FDR-3-SD-V1 FEDR-3-SD-ITM2 -V1	FEDR-3-SD-ITO50 -V1	FDR-4-SD -V1	FDR-4-SD-IRT-V1
Belt Thickness	3	3	4	4
Belt weight (kg/ m²) Add for each row of teeth	3.6 kg/ m² + 0.180 kg/ m	3.5 kg/ m² + 0.180 kg/ m	4.8 kg/ m² + 0.180 kg/ m	4.8 kg/ m² + 0.180 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.74 lb/ ft² + 0.121 lb/ ft	0.71 lb/ ft² + 0.121 lb/ ft	0.98 lb/ ft² + 0.121 lb/ ft	0.98 lb/ ft² + 0.121 lb/ ft
Minimum Pulley Diameter *(normal flex)	100 mm / 3.94"		130 mm / 5.12"	140 mm / 5.5"
Minimum Pulley Diameter *(back flex)	100mm / 3.94"		150 mm / 5.90"	150 mm / 5.90"
Maximum pull force (kg/ cm width)	6.5	5.5	8.6	6.5
Maximum pull force (lb/ in. width)	36.3	30.7	48.4	36.3

*All inch sizes have been converted from metric sizes.



Base Belt Thickness: 3 or 4mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm
Standard width: - 2 rows of teeth = 1524mm / 60″
- 3 rows of teeth* = 2032mm / 80″

Max. belt width with one row of teeth: 910mm / 35.8″
Min. belt width with two rows of teeth: 800mm / 31.5″
Distance between teeth rows, center to center: 605 ±2mm / 24.13 ±0.08″
Tooth Length: 78mm / 3.07″

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Note: *Please contact Volta Belting representative for additional information.

Pulley Guidelines & Fabrication Options

Table 2.d

Belt Type	FDR-3-SD-V1, FEDR-3-SD-ITM2-V1, FEDR-3-SD-ITO50 -V1			
MPD Base Belt	10mm		3.94"	
Minimum Pulley Diameter for V-Flights*				
Electrode EVDR -V1	135mm		5.31"	
VDR-10 -V1	148mm		5.82"	
VDR-13 -V1	161mm		6.34"	
VDR-17 -V1	207mm		8.15"	
Minimum Pulley Diameter for High Frequency Welded Flights				
App. Temperature	Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F	
Flight 3 - 5 mm	106mm	4.17"	165mm	6.5"
Flight 6 - 8 mm	136mm	5.35"	195mm	7.68"
Minimum Pulley Diameter for 2mm Baseless Sidewalls* (2mm Thick)				
	Normal Flex		**Back Flex**	
B-SW 30mm/ 1”	100mm	3.94"	110mm	4.33"
B-SW 40 mm/ 1.5”	100mm	3.94"	120mm	4.72"
B-SW 50 mm/ 2”	100mm	3.94"	150mm	5.90"
B-SW 60 mm/ 2.5”	110mm	4.33"	180mm	7.10"
B-SW 80 mm/ 3”	130mm	5.12"	230mm	9.05"
B-SW 100 mm/ 4”	160mm	6.30"	300mm	11.81"
B-SW 130 mm/ 5”	210mm	8.27"	400mm	15.75"
B-SW 150 mm/ 6”	250mm	9.84"	450mm	17.72"
Minimum Pulley Diameter for Two Top Guides*				
	Normal Flex		**Back Flex**	
VDR-10 -V1	158mm	6.22"	158mm	6.22"
VDR-13 -V1	171mm	6.73"	171mm	6.73"
VDR-17 -V1	217mm	8.54"	217mm	8.54"

Belt Type	FDR-4-SD -V1			
MPD Base Belt	130mm		5.12"	
Minimum Pulley Diameter for V-Flights*				
Electrode EVDR -V1	165mm		6.5"	
VDR-10 -V1	178mm		7"	
VDR-13 -V1	191mm		7.52"	
VDR-17 -V1	237mm		9.33"	
Minimum Pulley Diameter for High Frequency Welded Flights				
App. Temperature	Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F	
Flight 3 - 5 mm	136mm	5.35"	195mm	7.68"
Flight 6 - 8 mm	151mm	5.94"	205mm	8.1"
Minimum Pulley Diameter for 2mm Baseless Sidewalls* (2mm Thick)*				
	Normal Flex		**Back Flex**	
B-SW 30mm/ 1”	120mm	4.72"	150mm	5.9"
B-SW 40 mm/ 1.5”	120mm	4.72"	150mm	5.9"
B-SW 50 mm/ 2”	120mm	4.72"	160mm	6.3"
B-SW 60 mm/ 2.5”	120mm	4.72"	190mm	7.48"
B-SW 80 mm/ 3”	130mm	5.12"	240mm	9.45"
B-SW 100 mm/ 4”	160mm	6.30"	310mm	12.2"
B-SW 130 mm/ 5”	210mm	8.27"	420mm	16.53"
B-SW 150 mm/ 6”	250mm	9.84"	470mm	18.5"
Minimum Pulley Diameter for Two Top Guides*				
	Normal Flex		**Back Flex**	
VDR-10 -V1	188mm	7.4"	188mm	7.4"
VDR-13 -V1	201mm	7.91"	201mm	7.91"
VDR-17 -V1	247mm	9.71"	247mm	9.71"

All inch sizes have been converted from metric sizes.

Note: *Wait 2 hours before checking the welding quality of fabrications welded with hot air.
Leister Set-up : Welding speed +/- 0.5m/min; Power: 7.5-8.5.

- **Sidewalls & Guides:** must be positioned with a minimum gap of 100mm from the belt teeth.
- **HF Welded Flights:** should be welded between the teeth as indicated in the sketch on Page 16. Can be welded over the teeth if they do not exceed the tooth width, but not next to the teeth as indicated in the sketch.
- **Pulleys:** must be equal to, or larger than the minimum pulley specification

'M' Material SuperDrive™ Belts

The belts are designed for conveyors where fabrications or sidewalls are needed.

- **Material:** Volta MW, Beige / Volta MB, Blue / Volta MB, Blue02
- **Shore Hardness:** 53D
- **Temperature Range** (see Table 8b)*: -20°C to 70°C/-5°F to 158°F
- **Coefficient of Friction Smooth Bottom Belt:** Steel & Stainless Steel: 0.5 / UHMW: 0.28
- **Coefficient of Friction Embossed Bottom Belt:** Steel & Stainless Steel: 0.38 / UHMW: 0.22
- **Certification:** FDA/ USDA/ USDA Dairy/ EU Approved
  *According to "Temperature Correction Factor" from Table 8b. Page 41.

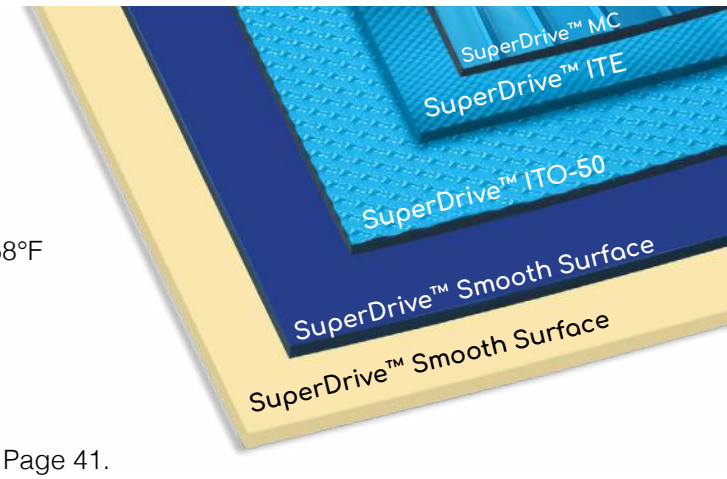
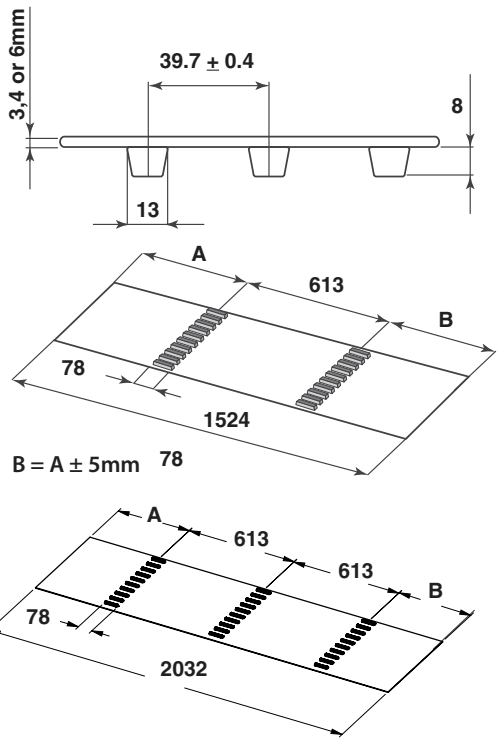


Table 2.e

Product	FMB-3-SD FMW-3-SD FMB-3-SD BLUE02 FEMB-3-SD-ITM2	FMB-3-SD-ITE	FMB-3-SD-ITO50	**FMB-3-SD-MC	FMB-4-SD FMW-4 SD FEMB-4-SD-ITM2	FMB-6-SD
Belt Thickness	3	3	3	3	4	6
Belt weight (kg/ m²) Add for each row of teeth	3.6 kg/ m² + 0.180 kg/ m	3.6 kg/ m² + 0.180 kg/ m	3.5 kg/ m² + 0.180 kg/ m	4.35 kg/ m² + 0.180 kg/ m	4.8 kg/ m² + 0.180 kg/ m	7.2 kg/ m² + 0.180 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.74 lb/ ft² + 0.121 lb/ ft	0.74 lb/ ft² + 0.121 lb/ ft	0.71 lb/ ft² + 0.121 lb/ ft	0.89 lb/ ft² + 0.121 lb/ ft	0.98 lb/ ft² + 0.121 lb/ ft	1.48 lb/ ft² + 0.121 lb/ ft
Minimum pulley diameter (normal flex)*	80 mm/ 3.15"			100 mm/ 3.94"	120 mm/ 4.72"	240 mm/ 9.45"
Minimum pulley diameter (back flex)*	100 mm/ 3.94"			100 mm/ 3.94"	150 mm/ 5.90"	280 mm/ 11"
Maximum pull force (kg/ cm width)	6.25			6.25	8	12.5
Maximum pull force (lb/ in. width)	35			35	44.8	70

*All inch sizes have been converted from metric sizes.

Note: **FMB-3-SD-MC belt is available in 1016mm/40" only.
6mm material SuperDrive™ belts are usually used in heavy load applications and therefore we recommend using the largest Drive Pulleys possible to ensure maximum engagement between belt and Drive Pulley teeth.



Base Belt Thickness: 3,4 or 6mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm
Standard width: - 2 rows of teeth = 1524mm / 60"
- 3 rows of teeth* = 2032mm / 80"
Max. belt width with one row of teeth: 910mm / 35.8"
Min. belt width with two rows of teeth: 800mm / 31.5"
Distance between teeth rows, center to center: 613 ±2mm / 24.13 ±0.08"
Tooth Length: 78mm / 3.07"

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Note: *Please contact Volta Belting representative for additional information.

Pulley Guidelines & Fabrication Options

Table 2.f

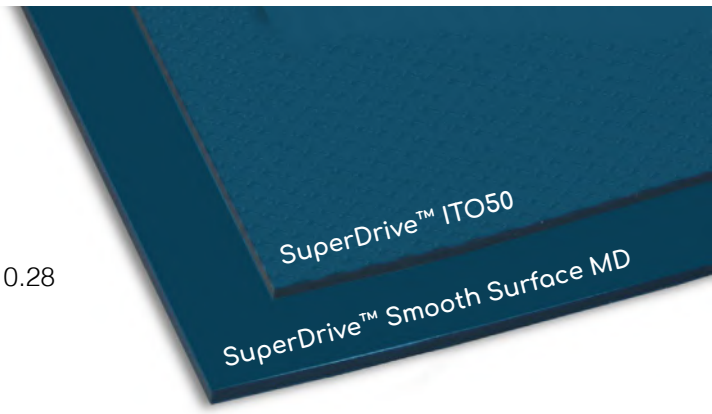
Belt Type	FMB-3-SD / FMW-3-SD FMB-3-SD BLUE02 FMB-3-SD-ITE FMB-3-SD-ITO50 FEMB-3-SD-ITM2				FMB-4-SD / FMW-4-SD FEMB-4-SD-ITM2				FMB-6-SD			
MPD Base Belt	80mm		3.15"		120mm		4.72"		240mm		9.45"	
Minimum Pulley Diameter for V-Flights												
Electrode	120mm		4.72"		150mm		5.90"		280mm		11.02"	
VLC / VLB 10	130mm		5.12"		170mm		6.70"		290mm		11.42"	
VLC / VLB 13	140mm		5.51"		180mm		7.08"		300mm		11.81"	
VLC / VLB 17	155mm		6.10"		195mm		7.68"		315mm		12.40"	
Minimum Pulley Diameter for Electrode Welded Flights												
Single Electrode 7	125mm		4.92"		150mm		5.90"		240mm		9.45"	
Single Electrode 9	140mm		5.51"		165mm		6.50"		240mm		9.45"	
Double Electrode 7	165mm		6.50"		190mm		7.48"		240mm		9.45"	
Double Electrode 9	N.R.				N.R.				N.R.			
Minimum Pulley Diameter for High Frequency Welded Flights												
App. Temperature	Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F		Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F		Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F	
Flight 3 - 5 mm	101mm	3.97"	151mm	5.94"	128mm	5.04"	180mm	7.09"	240mm	9.45"	240mm	9.45"
Flight 6 - 8 mm	128mm	5.04"	180mm	7.09"	143mm	5.63"	200mm	7.87"	240mm	9.45"	240mm	9.45"
Minimum Pulley Diameter for Based Sidewalls - (working temp.range -20° C to 35° C/-4° F to 95° F)												
	Normal Flex		Back Flex		Normal Flex		Back Flex					
SW-20	105 mm	4.13"	110 mm	4.33"	120 mm	4.72"	120 mm	4.72"	N.R.			
SW-30	105 mm	4.13"	125 mm	4.92"	120 mm	4.72"	125 mm	4.92"				
SW-40	115 mm	4.53"	150 mm	5.90"	130 mm	5.12"	150 mm	5.90"				
SW-50	125 mm	4.92"	175 mm	6.89"	130 mm	5.12"	175 mm	6.89"				
SW-60	130 mm	5.12"	200 mm	7.87"	135 mm	5.31"	200 mm	7.87"				
SW-80	150 mm	5.90"	250 mm	9.84"	150 mm	5.90"	250 mm	9.84"				
SW-100	200 mm	7.87"	300 mm	11.81"	200 mm	7.87"	300 mm	11.81"				
Minimum Pulley Diameter for Baseless Sidewalls (2mm Thick)												
	Normal Flex		Back Flex		Normal Flex		Back Flex		Normal Flex		Back Flex	
B-SW 30mm/ 1”	80mm	3.15"	110mm	4.33"	120mm	4.72"	150mm	5.90"	240mm	9.45"	280mm	11"
B-SW 40 mm/ 1.5”	90mm	3.54"	120mm	4.72"	120mm	4.72"	150mm	5.90"	240mm	9.45"	280mm	11"
B-SW 50 mm/ 2”	100mm	3.94"	150mm	5.90"	120mm	4.72"	160mm	6.30"	240mm	9.45"	280mm	11"
B-SW 60 mm/ 2.5”	110mm	4.33"	180mm	7.10"	120mm	4.72"	190mm	7.48"	240mm	9.45"	280mm	11"
B-SW 80 mm/ 3”	130mm	5.12"	230mm	9.05"	130mm	5.12"	240mm	9.45"	240mm	9.45"	280mm	11"
B-SW 100 mm/ 4”	160mm	6.30"	300mm	11.81"	160mm	6.30"	310mm	12.2"	240mm	9.45"	350mm	13.78"
B-SW 130 mm/ 5”	210mm	8.27"	400mm	15.75"	210mm	8.27"	420mm	16.53"	240mm	9.45"	480mm	18.90"
B-SW 150 mm/ 6”	250mm	9.84"	450mm	17.72"	250mm	9.84"	470mm	18.5"	310mm	12.20"	540mm	21.26"
Minimum Pulley Diameter for Two Top Guides (See also page 16)												
	Normal Flex		Back Flex		Normal Flex		Back Flex		Normal Flex		Back Flex	
VLB/VLC-13	145mm	5.70"	150mm	5.90"	185mm	7.28"	200mm	7.87"	305mm	12.01"	330mm	12.99"
VLB/VLC-17	177.5mm	6.99"	175mm	6.89"	217.5mm	8.56"	225mm	8.85"	338mm	13.31"	355mm	13.98"
CLB/CLC-13	124mm	4.88"	140mm	5.51"	164mm	6.45"	190mm	7.48"	284mm	11.18"	320mm	12.60"
CLB/CLC-17	146mm	5.74"	160mm	6.30"	186mm	7.32"	210mm	8.26"	306mm	12.05"	340mm	13.39"
VSB/VSC-13	125.5mm	4.94"	135mm	5.31"	165.5mm	6.52"	185mm	7.28"	286mm	11.26"	315mm	12.40"
VSB/VSC-17	145mm	5.70"	150mm	5.90"	185mm	7.28"	200mm	7.87"	305mm	12.01"	330mm	12.99"
CSB/CSC-13	110.8mm	4.36"	128mm	5.04"	150.8mm	5.93"	178mm	7"	271mm	10.67"	308mm	12.13"
CSB/CSC-17	124mm	4.88"	140mm	5.51"	164mm	6.45"	190mm	7.48"	284mm	11.18"	320mm	12.60"

All inch sizes have been converted from metric sizes.

Note: NR - Not Recommended.

- **Electrode Welded Flights:** We recommend welding the flights above the teeth location and flight thickness should not exceed the tooth base width.
- **Sidewalls & Guides:** must be positioned with a minimum gap of 100mm from the belt teeth.
- **Flights:** should be welded between the teeth as indicated in the sketch on Page 16. Can be welded over the teeth if they do not exceed the tooth width, but not next to the teeth as indicated in the sketch.
- **Pulleys:** must be equal to, or larger than the minimum pulley specification.

‘MD’ Metal Detectable Material SuperDrive™ Belts

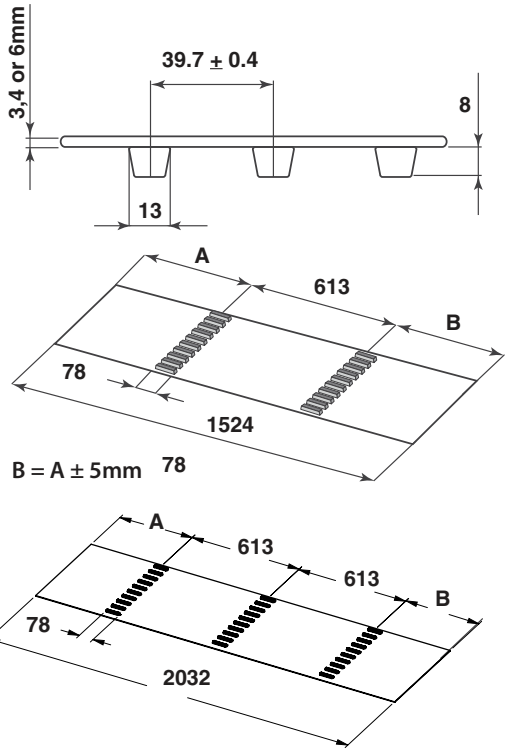


- **Material:** Volta MB-MD, Blue09
- **Shore Hardness:** 53D
- **Temperature Range:** -20°C to 60°C/-5°F to 140°F
- **Coefficient of Friction:** Steel: 0.5 /Stainless Steel: 0.5 /UHMW: 0.28
- **Certification:** FDA / EU Approved

Table 2.9

Product	FMB-3-SD-MD	FMB-3-SD-ITO50-MD
Belt Thickness	3	3
Belt weight (kg/ m²) Add for each row of teeth	3.75 kg/ m² + 0.1875 kg/ m	3.64 kg/ m2 + 0.1875 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.77 lb/ ft² + 0.126 lb/ ft	0.75 lb/ ft2 + 0.126 lb/ ft
Minimum pulley diameter (normal flex)*	100 mm/ 3.94"	100 mm/ 3.94"
Minimum pulley diameter (back flex)*	110 mm/ 4.33"	110 mm/ 4.33"
Maximum pull force (kg/ cm width)	6	6
Maximum pull force (lb/ in. width)	33.60	33.60

Note: *All inch sizes have been converted from metric sizes.



Base Belt Thickness: 3mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm

Standard width (2 rows of teeth): 1524mm / 60″
Max. belt width with one row of teeth: 910mm / 35.8″
Min. belt width with two rows of teeth: 800mm / 31.5″
Distance between teeth rows, center to center: 613 ±2mm / 24.13 ±0.08″
Tooth Length: 78mm / 3.07″

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Pulley Guidelines & Fabrication Options

Table 2.h

Belt Type	FMB-3-SD-MD / FMB-3-SD-ITO50-MD			
MPD Base Belt	100mm		3.94"	
Minimum Pulley Diameter for V-Flights				
Electrode EVMB-MD	135mm		5.31"	
VLB-MD 10	145mm		5.70"	
VLB-MD 13	155mm		6.10"	
VLB-MD 17	170mm		6.70"	
Minimum Pulley Diameter for Electrode Welded Flights				
Single Electrode 7	140mm		5.51"	
Single Electrode 9	150mm		5.90"	
Double Electrode 7	180mm		7.08"	
Double Electrode 9	NR			
Minimum Pulley Diameter for High Frequency Welded Flights				
App. Temperature	Temp ≥ 0° C	Temp ≥ 32° F	Temp < 0° C	Temp < 32° F
Flight 3 - 5 mm	116mm	4.56"	165mm	6.50"
Flight 6 - 8 mm	143mm	5.62"	195mm	7.67"
Minimum Pulley Diameter for Based Sidewalls (working temp. range -20°C to 40°C (-4°F to 104°F)				
	Normal Flex		Back Flex	
SW-20	105mm	4.13"	110 mm	4.33"
SW-30	105mm	4.13"	125 mm	4.92"
SW-40	115mm	4.53"	150 mm	5.90"
SW-50	125mm	4.92"	175 mm	6.89"
SW-60	130mm	5.12"	200 mm	7.87"
SW-80	150mm	5.90"	250 mm	9.84"
SW-100	200mm	7.87"	300 mm	11.81"
Minimum Pulley Diameter for Baseless Sidewalls (2mm Thick)				
	Normal Flex		**Back Flex**	
B-SW 30mm/ 1”	110mm	4.33"	120mm	4.72"
B-SW 40 mm/ 1.5”	110mm	4.33"	120mm	4.72"
B-SW 50 mm/ 2”	110mm	4.33"	150mm	5.90"
B-SW 60 mm/ 2.5”	110mm	4.33"	180mm	7.10"
B-SW 80 mm/ 3”	130mm	5.12"	230mm	9.05"
B-SW 100 mm/ 4”	160mm	6.30"	300mm	11.81"
B-SW 130 mm/ 5”	210mm	8.27"	400mm	15.75"
B-SW 150 mm/ 6”	250mm	9.84"	450mm	17.72"
Minimum Pulley Diameter for Two Top Guides (See also page 16)				
Guide Type	**Normal Flex**		**Back Flex**	
VLB-MD-13	152mm	5.89"	157mm	6.18"
VLB-MD-17	178mm	7"	175mm	6.89"
VLB-MD-22	220mm	8.66"	240mm	9.45"

All inch sizes have been converted from metric sizes.

Note: **NR -** Not Recommended.
All inch sizes have been converted from metric sizes.

Disclaimer: Volta Belting Ltd. recommends testing all the products in your environment to ascertain suitability. The information is supplied in good faith without warranty.

Guidelines and Suggested Materials for the Fabrication of FMB-3 SD MD belt

- **Electrode Welded Flights:** We recommend welding the flights above the teeth location and flight thickness should not exceed the tooth base width.
- **Sidewalls & Guides:** must be positioned with a minimum gap of 100mm from the belt teeth.
- **Flights:** should be welded between the teeth as indicated in the sketch on Page 16. Can be welded over the teeth if they do not exceed the tooth width, but not next to the teeth as indicated in the sketch.
- **Pulleys:** must be equal to, or larger than the minimum pulley specification.

‘LT’ Low Temperature Material SuperDrive™ Belts

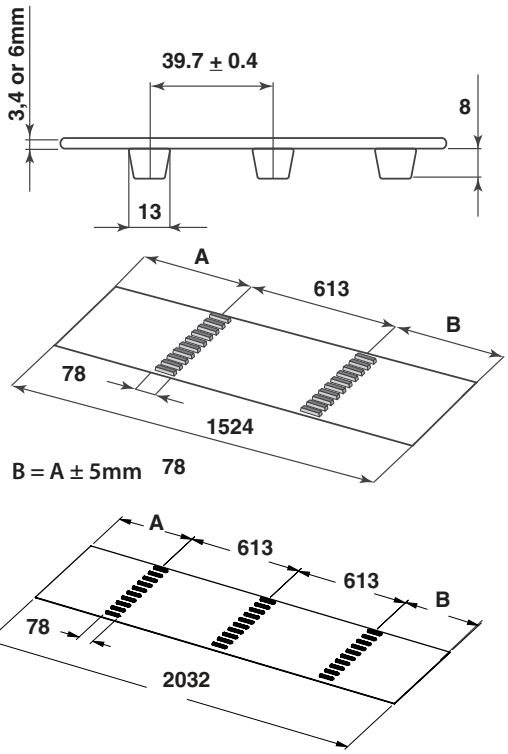
- **Material:** Volta MB-LT, Blue15
- **Shore Hardness:** 95A/ 46D
- **Temperature Range** (see Table 8b)*: -35°C to 65°C/-31°F to 149°F
- **Coefficient of Friction: Steel:** 0.55 /Stainless Steel: 0.55 /UHMW: 0.30
- **Certification:** FDA / EU Approved

* According to "Temperature Correction Factor" from Table 8b. Page 41.

Table 2.i

Product	FMB-3-SD-LT
Belt Thickness	3
Belt weight (kg/ m²) Add for each row of teeth	3.6 kg/ m² + 0.180 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.74 lb/ ft² + 0.121 lb/ ft
Minimum pulley diameter (normal flex)*	80 mm/ 3.15"
Minimum pulley diameter (back flex)*	100 mm/ 3.94"
Maximum pull force (kg/ cm width)	3
Maximum pull force (lb/ in. width)	16.8

Note: *All inch sizes have been converted from metric sizes.



Base Belt Thickness: 3mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm

Standard width (2 rows of teeth): 1524mm / 60″
Max. belt width with one row of teeth: 910mm / 35.8″
Min. belt width with two rows of teeth: 800mm / 31.5″
Distance between teeth rows, center to center: 613 ±2mm / 24.13 ±0.08″
Tooth Length: 78mm / 3.07″

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Pulley Guidelines & Fabrication Options

Table 2.j

Belt Type	FMB-3-SD-LT			
MPD Base Belt	80mm		3.15"	
Minimum Pulley Diameter for V-Flights (working temp. range -20°C to 40°C (-4°F to 104°F)				
Electrode EVMB-LT	120mm		4.72"	
VLB-LT/VLB/VLC-10	130mm		5.12"	
VLB-LT/VLB/VLC-13	140mm		5.51"	
VLB-LT/VLB/VLC-17	155mm		6.10"	
Minimum Pulley Diameter for High Frequency Welded Flights				
App. Temperature	Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F	
Flight 3 - 5 mm	101mm	3.97"	151mm	5.94"
Flight 6 - 8 mm	128mm	5.04"	180mm	7.09"
Minimum Pulley Diameter for Based Sidewalls (working temp. range -20°C to 35°C (-4°F to 95°F)				
	Normal Flex		**Back Flex**	
SW-20	105mm	4.13"	110 mm	4.33"
SW-30	105mm	4.13"	125 mm	4.92"
SW-40	115mm	4.53"	150 mm	5.90"
SW-50	125mm	4.92"	175 mm	6.89"
SW-60	130mm	5.12"	200 mm	7.87"
SW-80	150mm	5.90"	250 mm	9.84"
SW-100	200mm	7.87"	300 mm	11.81"
Minimum Pulley Diameter for 2mm Baseless Sidewalls (2mm Thick)				
	Normal Flex		**Back Flex**	
B-SW 30mm/ 1”	80mm	3.15"	110mm	4.33"
B-SW 40 mm/ 1.5”	90mm	3.54"	120mm	4.72"
B-SW 50 mm/ 2”	100mm	3.94"	150mm	5.90"
B-SW 60 mm/ 2.5”	110mm	4.33"	180mm	7.10"
B-SW 80 mm/ 3”	130mm	5.12"	230mm	9.05"
B-SW 100 mm/ 4”	160mm	6.30"	300mm	11.81"
B-SW 130 mm/ 5”	210mm	8.27"	400mm	15.75"
B-SW 150 mm/ 6”	250mm	9.84"	450mm	17.72"
Minimum Pulley Diameter for Two Top Guides (See also page 16)				
	Normal Flex		**Back Flex**	
VLB-LT/VLB/VLC-13	145mm	5.70"	150mm	5.90"
VLB-LT/VLB/VLC-17	177.5mm	6.99"	175mm	6.89"
CLB-LT/CLB/CLC-13	124mm	4.88"	140mm	5.51"
CLB-LT/CLB/CLC-17	146mm	5.74"	160mm	6.30"
VSB/VSC-13	125.5mm	4.94"	135mm	5.31"
VSB/VSC-17	145mm	5.70"	150mm	5.90"
CSB/CSC-13	110.8mm	4.36"	128mm	5.04"
CSB/CSC-17	124mm	4.88"	140mm	5.51"

Note: *All inch sizes have been converted from metric sizes.

Guidelines and Suggested Materials for the Fabrication of FMB-3 SD LT belt

- **Sidewalls & Guides:** It is possible to weld Sidewalls from L material to the LT belts. Sidewalls & Guides must be positioned at a minimum distance of 100mm from the belt teeth.
- **HF Welded Flights:** LT material should be used for the flights. MB material is also acceptable but in this case you should make sure that the temperature of your application, including disinfection procedures, do not exceed the regular MB LT materials limit. Should be welded between the teeth as indicated in the sketch on page 16. Can be welded over the teeth if they do not exceed the tooth width, but not next to the teeth as indicated in the sketch.
- **HF Welding:** We only approve HF welding of flights on LT belts.
- **Endless Joining:** We recommend joining LT belts with a butt weld using the FBW Tool.

‘Z’ Material SuperDrive™ Belt for Industrial Applications

- **Material:** Volta Z, Green 05
- **Shore Hardness:** 95A
- **Temperature Range** (see Table 8b)*: -30°C to 70°C/-20°F to 158°F
- **Coefficient of Friction Embossed Bottom Belt:**
  Steel & Stainless Steel: 0.4 / UHMW: 0.25

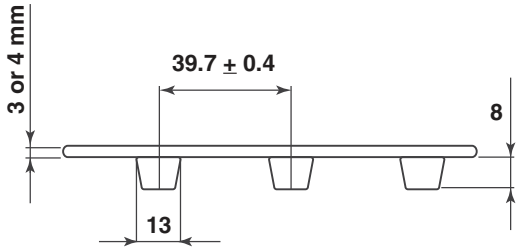
* According to "Temperature Correction Factor" from Table 8b. Page 41.

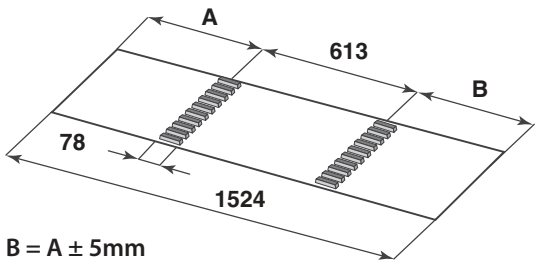
Table 2.k

Product	FEZ-3-SD-ITM2	FEZ-4-SD-ITM2
Belt Thickness	3	4
Belt weight (kg/ m²) Add for each row of teeth	3.6 kg/ m² + 0.180 kg/ m	4.8 kg/ m² + 0.180 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.74 lb/ ft² + 0.121 lb/ ft	0.98 lb/ ft² + 0.121 lb/ ft
Minimum pulley diameter (normal flex)*	80 mm/ 3.15"	120 mm/ 4.72"
Minimum pulley diameter (back flex)*	100 mm/ 3.94"	150 mm/ 5.90"
Maximum pull force (kg/ cm width)	5	6.6
Maximum pull force (lb/ in. width)	28	37

* All inch sizes have been converted from metric sizes.

Note: *4mm material SuperDrive™ belts are usually used in heavy load applications and therefore we recommend using 12 teeth or larger Drive Pulleys to ensure maximum engagement between belt and Drive Pulley teeth.





Base Belt Thickness: 3 or 4mm
Pitch Between Teeth: 39.7 ±0.4mm
Tooth Width: 13mm
Tooth Height: 8mm

Standard width (2 rows of teeth): 1524mm / 60″
Max. belt width with one row of teeth: 910mm / 35.8″
Min. belt width with two rows of teeth: 800mm / 31.5″
Distance between teeth rows, center to center: 613 ±2mm / 24.13 ±0.08″
Tooth Length: 78mm / 3.07″

Belt Width

W<800	800<W<910	W>910
1 row	1 row or 2 rows	2 rows

Belt Length

Belt length will always be supplied in multiples of 39.7mm (tooth pitch).

Pulley Guidelines & Fabrication Options

Table 2.1

Belt Type	FEZ-3-SD-ITM2				FEZ-4-SD-ITM2			
MPD Base Belt	80mm		3.15"		120mm		4.72"	
Minimum Pulley Diameter for V-Flights								
Electrode	120mm		4.72"		150mm		5.90"	
VL/VLC/VLB 10	130mm		5.12"		170mm		6.70"	
VLC/VLC/VLB 13	140mm		5.51"		180mm		7.08"	
VLC/VLB 17	155mm		6.10"		195mm		7.68"	
Minimum Pulley Diameter for Electrode Welded Flights								
Single Electrode 7	125mm		4.92"		150mm		5.90"	
Single Electrode 9	140mm		5.51"		165mm		6.50"	
Double Electrode 7	165mm		6.50"		190mm		7.48"	
Double Electrode 9	N.R.				N.R.			
Minimum Pulley Diameter for High Frequency Welded Flights								
App. Temperature	Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F		Temp ≥ 0° C / 32° F		Temp < 0° C / 32° F	
Flight 3 - 5 mm	101mm	3.97"	151mm	5.94"	128mm	5.04"	180mm	7.09"
Flight 6 - 8 mm	128mm	5.04"	180mm	7.09"	143mm	5.63"	200mm	7.87"
Minimum Pulley Diameter for Based Sidewalls (working temp.range -20° C to 35° C/-4° F to 95° F)								
	Normal Flex		**Back Flex**		**Normal Flex**		**Back Flex**	
SW-20	105 mm	4.13"	110 mm	4.33"	120 mm	4.72"	120 mm	4.72"
SW-30	105 mm	4.13"	125 mm	4.92"	120 mm	4.72"	125 mm	4.92"
SW-40	115 mm	4.53"	150 mm	5.90"	130 mm	5.12"	150 mm	5.90"
SW-50	125 mm	4.92"	175 mm	6.89"	130 mm	5.12"	175 mm	6.89"
SW-60	130 mm	5.12"	200 mm	7.87"	135 mm	5.31"	200 mm	7.87"
SW-80	150 mm	5.90"	250 mm	9.84"	150 mm	5.90"	250 mm	9.84"
SW-100	200 mm	7.87"	300 mm	11.81"	200 mm	7.87"	300 mm	11.81"
Minimum Pulley Diameter for Baseless Sidewalls (2mm Thick)								
	Normal Flex		**Back Flex**		**Normal Flex**		**Back Flex**	
B-SW 30mm/ 1”	80mm	3.15"	110mm	4.33"	120mm	4.72"	150mm	5.90"
B-SW 40 mm/ 1.5”	90mm	3.54"	120mm	4.72"	120mm	4.72"	150mm	5.90"
B-SW 50 mm/ 2”	100mm	3.94"	150mm	5.90"	120mm	4.72"	160mm	6.30"
B-SW 60 mm/ 2.5”	110mm	4.33"	180mm	7.10"	120mm	4.72"	190mm	7.48"
B-SW 80 mm/ 3”	130mm	5.12"	230mm	9.05"	130mm	5.12"	240mm	9.45"
B-SW 100 mm/ 4”	160mm	6.30"	300mm	11.81"	160mm	6.30"	310mm	12.2"
B-SW 130 mm/ 5”	210mm	8.27"	400mm	15.75"	210mm	8.27"	420mm	16.53"
B-SW 150 mm/ 6”	250mm	9.84"	450mm	17.72"	250mm	9.84"	470mm	18.5"
Minimum Pulley Diameter for Two Top Guides (See also page 16)								
	Normal Flex		**Back Flex**		**Normal Flex**		**Back Flex**	
VL/VLB/VLC-13	145mm	5.70"	150mm	5.90"	185mm	7.28"	200mm	7.87"
VL/VLB/VLC-17	177.5mm	6.99"	175mm	6.89"	217.5mm	8.56"	225mm	8.85"
CL/CLB/CLC-13	124mm	4.88"	140mm	5.51"	164mm	6.45"	190mm	7.48"
CL/CLB/CLC-17	146mm	5.74"	160mm	6.30"	186mm	7.32"	210mm	8.26"
VSB/VSC-13	125.5mm	4.94"	135mm	5.31"	165.5mm	6.52"	185mm	7.28"
VSB/VSC-17	145mm	5.70"	150mm	5.90"	185mm	7.28"	200mm	7.87"
CSB/CSC-13	110.8mm	4.36"	128mm	5.04"	150.8mm	5.93"	178mm	7"
CSB/CSC-17	124mm	4.88"	140mm	5.51"	164mm	6.45"	190mm	7.48"

All inch sizes have been converted from metric sizes.

Note: **NR - Not Recommended**.

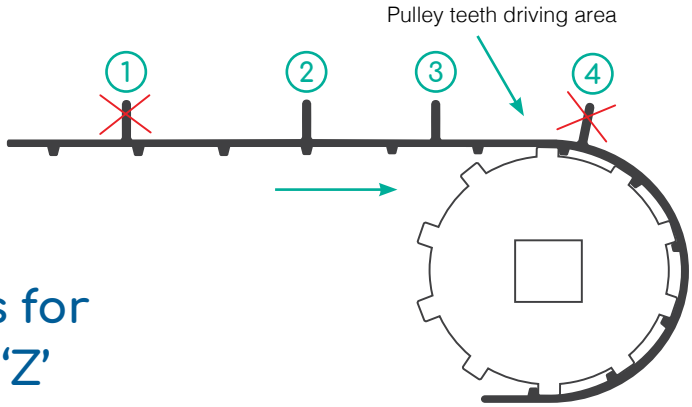
- **Electrode Welded Flights:** We recommend welding the flights above the teeth location and flight thickness should not exceed the tooth base width.
- **Sidewalls & Guides:** must be positioned with a minimum gap of 100mm from the belt teeth.
- **Flights:** should be welded between the teeth as indicated in the sketch on Page 16. Can be welded over the teeth if they do not exceed the tooth width, but not be welded next to the teeth as indicated in the sketch.
- **Pulleys:** must be equal to, or larger than the minimum pulley specification.

Recommended Welding Location for Flights

Locations 1&4 are not recommended because the flight is in line with the tooth engagement area. Locations 2&3 are recommended.

- **HF welding:** Location 3 is recommended. Location 2 is optional.
- **Electrode welding:** Location 2 is recommended. Location 3 is optional.

Note: In location 2, it is essential that the cleat and weld widths do not exceed the width of the belt tooth.



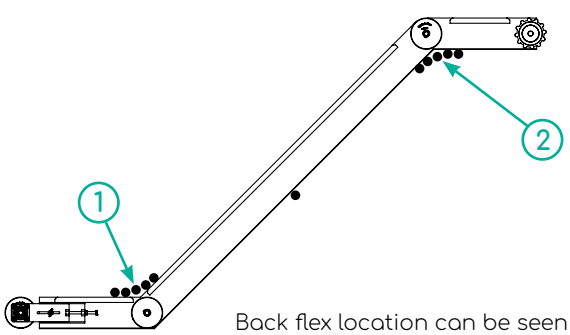
Minimum Pulley Specifications for SuperDrive™ 'DR'/'M'/'MD'/'LT'/'Z' Material Belts with Top Guides

For SuperDrive™ belts 600mm guides should be welded on both upper edge sides of the belt, indented to allow grooved roller to run over them. The belt guides sit in the v-pulley grooves in the transition sections of the conveyor (see the picture).

When using wide belts, it is very important to support the belt on the return side. Using cleats may cause problems and it may be necessary to make a center gap in the cleat to enable supporting the belt.

Base Belt Material	Belt Type	SuperDrive™ 3mm Thick Belts				SuperDrive™ 4mm Thick Belts				SuperDrive™ 6mm Thick Belts			
	Guide Types	Normal Flex		Back Flex		Normal Flex		Back Flex		Normal Flex		Back Flex	
M & Z - material	VLB/VLC-13	145 mm	5.70"	150 mm	5.9"	185 mm	7.28"	200 mm	7.87"	305 mm	12"	330 mm	12.99"
	VLB/VLC-17	177.5 mm	7"	175 mm	6.89"	217.5 mm	8.56"	225 mm	8.85"	338 mm	13.31"	355 mm	13.98"
	CLB/CLC-13	124 mm	4.88"	140 mm	5.51"	164 mm	6.45"	190 mm	7.48"	284 mm	11.18"	320 mm	12.60"
	CLB/CLC-17	146 mm	5.74"	160 mm	6.30"	186 mm	7.32"	210 mm	8.26"	306 mm	12.05"	340 mm	13.39"
	VSB/VSC-13	125.5 mm	4.94"	135 mm	5.31"	165.5 mm	6.50"	185 mm	7.28"	286 mm	11.26"	315 mm	12.40"
	VSB/VSC-17	145 mm	5.70"	150 mm	5.90"	185 mm	7.28"	200 mm	7.87"	305 mm	12"	330 mm	13"
	CSB/CSC-13	110.8 mm	3.96"	128 mm	5.04"	150.8 mm	5.93"	178 mm	7"	271 mm	10.7"	308 mm	12.1"
	CSB/CSC-17	124 mm	4.88"	140 mm	5.51"	164 mm	6.45"	190 mm	7.48"	284 mm	11.18"	320 mm	12.60"
LT - material (Low Temperature)	VLB-LT-13	145 mm	5.70"	150 mm	5.9"								
	VLB-LT-17	177.5 mm	7"	175 mm	6.89"								
MD - material (Metal Detectable)	VLB-MD-13	145 mm	5.70"	150 mm	5.9"								
	VLB-MD-17	177.5 mm	7"	175 mm	6.89"								
DR - material (Hydrolysis Resistant)	VDR-10-V1	158 mm	6.22"	158 mm	6.22"	188mm	7.4"	188mm	7.4"				
	VDR-13-V1	171 mm	6.73"	171 mm	6.73"	201mm	7.91"	201mm	7.91"				
	VDR-17-V1	217 mm	8.54"	217 mm	8.54"	247mm	9.71"	247mm	9.71"				

All inch sizes have been converted from metric sizes.



Back flex location can be seen in positions 1 and 2

Accessories

Volta Belting provides all the accessories required to operate the SuperDrive™ belt.

Volta Pulleys are manufactured from abrasion resistant materials that ensure a long and reliable operating life. All pulleys- both white and blue color- are made from FDA approved material.

Drive Pulley

Drive Pulley

SuperDrive™ pulleys are compatible with 'H', 'DR' and 'M'material family belts. The standard pulley diameters are 100 mm (4"), 150 mm (6") and 200 mm (8") with a square bore. Other dimensions are available on request. For more information consult your local Volta dealer.

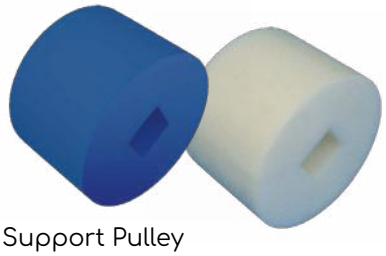
Tail Pulley

Tail Pulley

The tail pulley has smooth surfaces with a guide groove for the belt teeth. This pulley is available with the same dimensions and bore description as the drive pulley.

Support Pulley

The support pulleys are designed to support the belt for heavy loads or when the belt is significantly wider than the drive and tail pulleys (see Selection of Support Pulleys on Page 44). The support pulley has a smooth surface and is available in a standard width of 100 mm/4". This pulley is available with the same diameter and bore description as the drive pulley.



Support Pulley

SuperDrive™ Drive Pulley Specifications

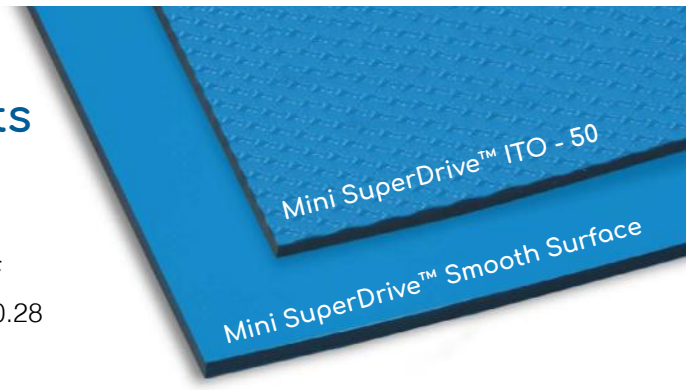
Selection of the Drive Pulley should be done on the basis of Minimum Pulley Diameter permitted for the belt as noted on the belt data. The selected pulley diameter must be greater or equal to the minimum pulley allowed for the belt Technical Data page.

Number of Teeth	SuperDrive™ 3mm & 4mm Thick Belts						SuperDrive™ 6mm Thick Belts			
	O.D. Ø		Belt Pitch Ø				O.D. Ø		Belt Pitch Ø	
			3mm Thick Belt		4mm Thick Belt					
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
8	100.5	3.96	103.50	4.07	104.5	4.11	-	-	-	-
10	126.40	4.98	129.40	5.09	130.4	5.13	-	-	-	-
12	151.40	5.96	154.40	6.08	155.4	6.12	-	-	-	-
14	177.10	6.97	180.10	7.09	181.1	7.13	-	-	-	-
16	202.90	7.98	205.90	8.07	206.9	8.15	-	-	-	-
18	228.60	9	231.60	9.12	232.6	9.16	-	-	-	-
20	254.30	10	257.60	10.13	258.6	10.18	252.6	9.94	258.6	10.18
21	-	-	-	-	-	-	265.6	10.45	271.6	10.69
22	-	-	-	-	-	-	278.5	10.96	284.5	11.2
23	-	-	-	-	-	-	291.4	11.47	297.4	11.7
24	-	-	-	-	-	-	304.3	11.97	310.3	12.21

Note: 4mm material SuperDrive™ belts are usually used in heavy load applications and therefore, we recommend using 12 teeth or larger Drive Pulleys to ensure more engagement between belt and Drive Pulley teeth.
6mm material SuperDrive™ belts are usually used in heavier load applications and therefore we recommend using the largest Drive Pulley available to ensure more engagement between the belt and Drive Pulley teeth.

- Standard Drive & Tail Pulley Width = 190+10 mm / 7½+$^{3}/_{8}$"
- Standard Support Pulley Width = 95+5 mm / 3¾ +$^{3}/_{16}$"
- Standard Square Bore Dimensions = 40mm / 1½"
- Non-Standard Round Bores are available upon request.
- Non-Standard Square Bore Dimensions, available upon request:
  • 25mm / 1"; • 50mm / 2"; • 2½"; • 3½".

‘M’ Material Mini SuperDrive™ Belts



- **Material:** Volta MB, Blue
- **Shore Hardness:** 95A / 46D
- **Temperature Range** (see Table 8b)*: -20°C to 70°C/-5°F to 158°F
- **Coefficient of Friction:** Steel: 0.5 / Stainless Steel: 0.5 / UHMW: 0.28
- **Certification:** FDA / USDA / USDA Dairy / EU Approved.

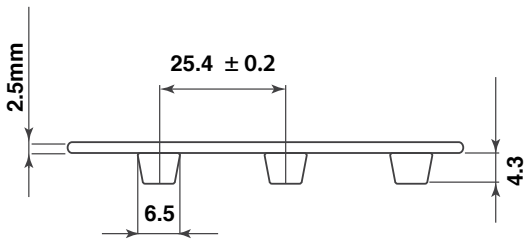
* According to “Temperature Correction Factor" from Table 8b. Page 41.

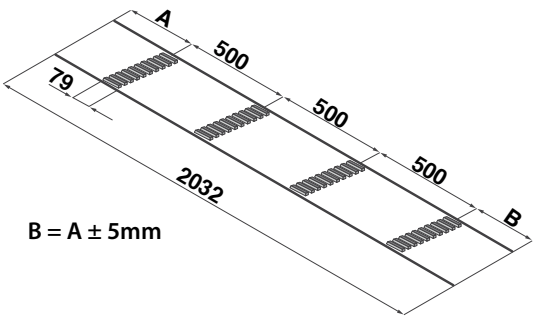
Table 3.a

Product	FMB-2.5-MSD	FMB-2.5-MSD-ITO50
Belt Thickness	2.5	2.5
Belt weight (kg/ m²) Add for each row of teeth	3 kg/ m² + 0.073 kg/ m	2.63 kg/ m² + 0.073 kg/ m
Belt weight (lb/ ft²) Add for each row of teeth	0.615 lb/ ft² + 0.049 lb/ ft	0.54 lb/ ft² + 0.049 lb/ ft
Minimum pulley diameter (normal flex)*	48 mm/ 1.89"	48 mm/ 1.89"
Minimum pulley diameter (back flex)*	65 mm/ 2.56"	65 mm/ 2.56"
Max pull force (kg/ cm width)	4	4
Max pull force (lb/ in. width)	22.4	22.4

* All inch sizes have been converted from metric sizes.

Note: *All inch sizes have been converted from metric sizes.





Base Belt Thickness: 2.5mm
Pitch Between Teeth: 25.40mm/1"±0.20mm
Tooth Base: 6.5mm
Tooth Height: 4.3mm

Standard width (4 rows of teeth): 2032mm / 80"
Max belt width with one row of teeth: 920mm / 36.22"
Distance between teeth rows, center to center: 500mm / 19.68"
Tooth Length: 79mm / 3.11"

Belt Width

W<920*	650<W<1420**	1150<W<1530	1650<W
1 row	2 rows	3 rows	4 rows

Note * W > 700mm ** W > 1200 mm
For these belt widths, consider to add pre-tension up to the 0.5% recommended. This is to support belt teeth engagement.

Pulley Guidelines & Fabrication Options

Table 3.b

Belt Type	FMB-2.5-MSD & FMB-2.5-MSD-ITO50			
MPD Base Belt	48mm/1.89"			
Minimum Pulley for Flat High Frequency Welded Flight				
App. Temperature	Temp≥0°C / 32°F		Temp<0°C / 32°F	
Cleats 3-4mm	80mm / 3.15"		120mm / 4.72"	
Minimum Pulley Diameter for Two Top Guides				
	Normal Flex		Back Flex	
VLB/VLC-8	100mm	3.94"	105mm	4.13"
VLB/VLC-10	106mm	4.17"	110mm	4.33"
VLB/VLC-13	113mm	4.45"	115mm	4.53"
CLB/CLC-13	87mm	3.43"	100mm	3.94"
CLB/CLC-17	92mm	3.62"	105mm	4.13"
VSC / VSB -8	81mm	3.19"	90mm	3.54"
VSC / VSB -10	87mm	3.43"	95mm	3.74"
VSC / VSB -13	94mm	3.70"	100mm	3.94"
CSC /CSB -10	73mm	2.87"	87mm	3.43"
CSC /CSB -13	79mm	3.11"	93mm	3.66"

All inch sizes have been converted from metric sizes.

Note: Contact Volta Belting representative for further details regarding Mini SuperDrive™ belt.
*All inch sizes have been converted from metric sizes.

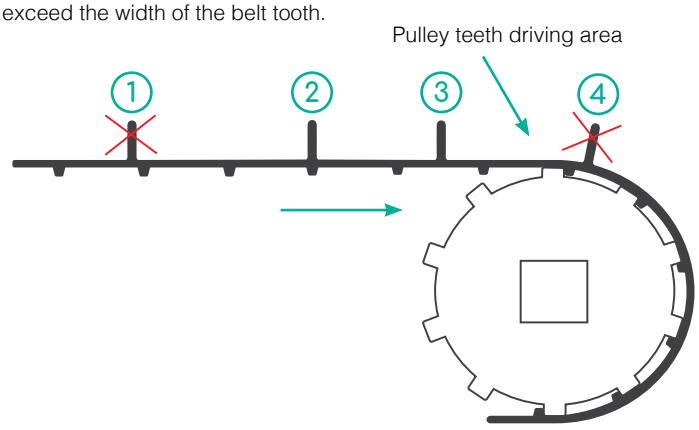
- **Flights:** Flights positioning: Flight welding position is recommended to be above the belt tooth as indicated in the sketch.
  It is also possible to weld in between the teeth centers.
  Maximum flight thickness: 4mm.
  Maximum flight height: 60mm.
- **Sidewalls:** Contact Volta Belting representative.
- **Guides:** Welding position must be at least 100mm away from belt teeth.

Recommended Flights Welding Location

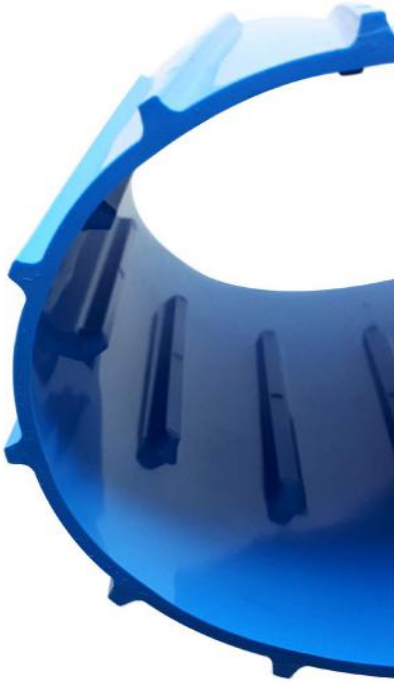
Locations 1&4 are not permitted.

- **HF welding:** location 2 is recommended; Location 3 is optional.
- **Electrode welding:** Is NOT permitted.

Note: In location 2, it is essential that the flight and weld widths do not exceed the width of the belt tooth.



‘M’ Material
Mini SuperDrive™ Belt with Mini Cleat (MC) Impression Top



- **Material:** Volta MB, Blue
- **Shore Hardness:** 95A / 46D
- **Temperature Range** (see Table 8b)*: -20°C to 70°C/-5°F to 158°F
- **Coefficient of Friction:** Bottom Surface: Steel: 0.5 / Stainless Steel: 0.5 / UHMW: 0.28
- **Certification:** FDA / USDA / USDA Dairy / EU Approved

* According to "Temperature Correction Factor" from Table 8b. Page 41.

Table 3.c

Product	FMB-2.5-MSD-MC
Belt Thickness	2.5
Belt weight (kg/m²) **Add for each row of teeth**	3.7 kg/ m² + 0.073 kg/ m
Belt weight (lb/ft²) **Add for each row of teeth**	0.76 lb/ ft² + 0.049 lb/ ft²
Minimum pulley diameter (normal flex)*	80mm/ 3.15"
Minimum pulley diameter (back flex)*	80mm/ 3.15"
Maximum pull force (kg/ cm width)	4
Maximum pull force (lb/ in. width)	22.4

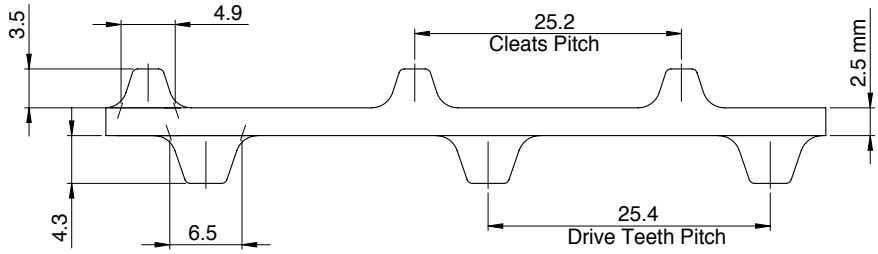
Note: *All inch sizes have been converted from metric sizes.

Bottom - Mini SuperDrive™

Base Belt Thickness: 2.5mm
Pitch Between Teeth: 25.40mm/1"±0.20mm
Tooth Base: 6.5mm
Tooth Height: 4.3mm

Top - Mini Cleat (MC)

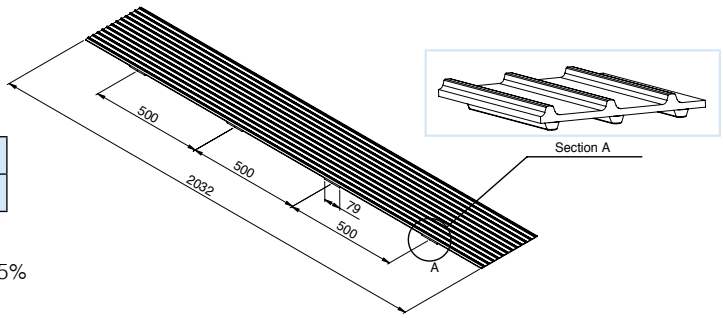
Pitch Between Cleats: 25.2mm
Cleat Base: 4.9mm
Cleat Height: 3.5mm



Standard width: 2032mm / 80"
Max belt width with one row of teeth: 920mm / 36.22"
Distance between teeth rows, center to center: 500mm / 19.68"
Tooth Length: 79mm / 3.11"

Belt Width

W<920*	650<W<1420**	1150<W<1530	1650<W
1 row	2 rows	3 rows	4 rows



Note: * W > 700mm ** W > 1200 mm
For these belt widths, consider to add pre-tension up to the 0.5% recommended. This is to support belt teeth engagement.

Minimum Pulley Specifications for Mini SuperDrive™ Belts with Top Guides

- For Mini SuperDrive™ belts 450mm or wider, we recommend using guides on both upper edge sides of the belt. The belt guides sit under the v-grooved rollers in the transition section of the conveyor. This is the recommended method.
- When using wide belts, it is very important to support the belt on the return side. Using flights adds weight and it may be necessary to make a center gap in the flight to enable supporting the belt.

Belt Type	Mini SuperDrive™ FMB-MSD & FMB-MSD ITO50			
Guide Types	Normal Flex		Back Flex	
VLB/VLC-8	100mm	3.94"	105mm	4.13"
VLB/VLC-10	106mm	4.17"	110mm	4.33"
VLB/VLC-13	113mm	4.45"	115mm	4.53"
CLB/CLC-13	87mm	3.43"	100mm	3.94"
CLB/CLC-17	92mm	3.62"	105mm	4.13"
VSC / VSB -8	81mm	3.19"	90mm	3.54"
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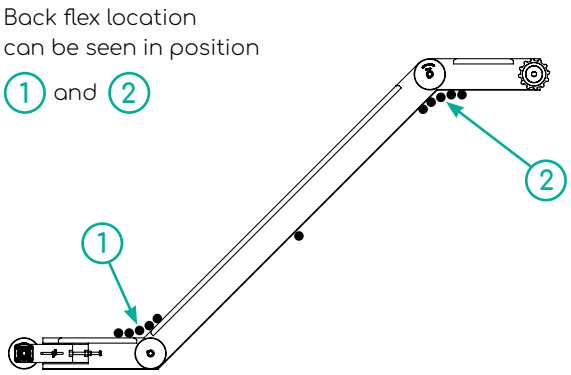
VSC / VSB -13	94mm	3.70"	100mm	3.94"
CSC /CSB -10	73mm	2.87"	87mm	3.43"
CSC /CSB -13	79mm	3.11"	93mm	3.66"

Note: All inch sizes have been converted from metric sizes.



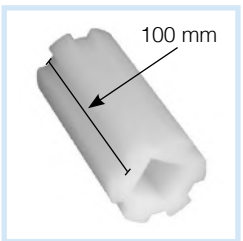
Mini SuperDrive™ Pulley Specifications

Number of Teeth	6		8		10		12		19	
Measurement	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Pulley Outer Diameter	48.0	1.89	65	2.56	80	3.15	96.5	3.8	154.3	6.07
Standard Belt Pitch Diameter	50.5	1.98	67.5	2.65	82.5	3.24	99	3.89	156.8	6.17
Standard Bore Size (Square)	20	3/4	25	1	40	1.5	40	1.5	40	1.5
Round Bore Diameter*/**	25	1	25	1	25	1	25	1	-	-
Max. Possible Square Bore Diameter	20	3/4	25	1	40	1.5	50	2	65	2.5
Max. Possible Round Bore Diameter	25	1	38	1.5	50	2	65	2.5	80	3.15
Sprocket Locking Device (More details on page 24).	Retainer Ring						Volta Locking Collar			

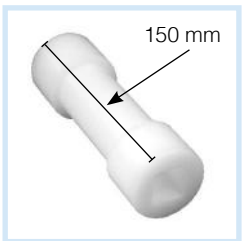
All inch sizes have been converted from metric sizes.

Note: *Round Bore Sprockets with keyway; from Acetal; for Drive and Support Pulleys.
**Round Bore Sprockets without keyway; from UHMW; for Tail and Support Pulleys.
The Pulley diameter and the bore size in the above table relate to all Pulley types (Drive,Tail,Support).

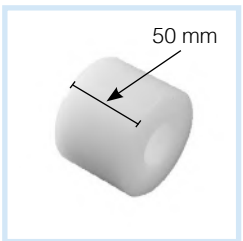
- Standard Drive Pulley Width = 100mm/4"
- Standard Tail Pulley Width = 150mm/6"
- Standard Support Pulley Width = 50mm/2"
- Non-Standard Square Bores are available upon request.
- Pulleys for center drive conveyors available upon request =19 Teeth-154.3mm/6.07"
- Default configuration: Drive pulley with keyway, Tail pulleys without keyway.



Drive Pulley



Tail Pulley



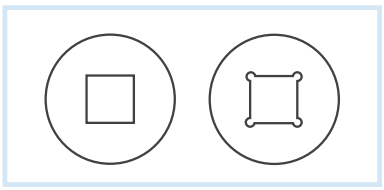
Support Pulley

4. Securing Pulleys

Pulley Bore Description

The SuperDrive™ drive, tail and support pulleys are available in two standard square bore dimensions 1½" and 40 mm. The 1½"v square bore dimension is also available with round corners. The round corner bore is designed to provide a channel for water to carry debris away during wash-down. Pulley bore dimensions should be chosen according to the load on the shaft to avoid shaft deflection and to transmit the required torque.

Pulley Bore patterns



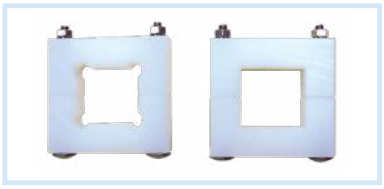
Standard bore Round Corner bore

Locking Collars

Square Stainless Steel Locking Collar is made of two parts of stainless steel wire with two bolts. This system can be assembled without dismantling the shaft and can be used with all sprocket types on 1½ (40mm) square shafts.

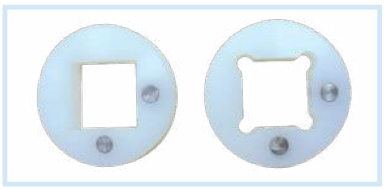
Square Stainless Steel Locking Collar

Square Plastic Locking Collar (UHMW) is made of two plastic parts that lock with two bolts. The collar can be assembled without dismantling the shaft. It can be used with pulleys that have 12 or more teeth and are available in 1½ in/ 40mm, 2" and 2.5" SuperDrive™ pulleys. Some bores can be ordered with round corners. Locking Collar face width = 20mm.



Square Plastic (UHMW) Locking Collar

Round Plastic Locking Collar (UHMW) suitable for SuperDrive™ 8 teeth and Mini SuperDrive™ 12 teeth pulleys and larger.
The shaft can be dismantled in order to assemble this locking collar.
The collar can be ordered in 1½ in/40mm and also with round corners for 1½ in. shaft. Locking Collar face width = 20mm.

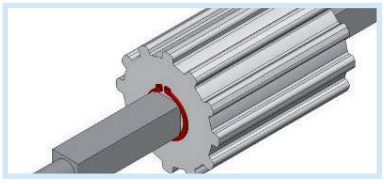


Round Plastic (UHMW)

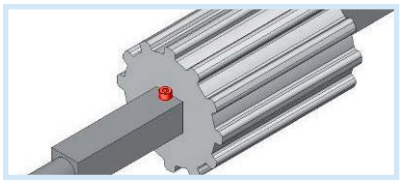
"C" Ring - Use a "C" ring on the shaft on either end of the pulley. Machine a groove suitable for the thickness of the "C" ring you are using. This method of securing the pulleys is standard with modular belting.

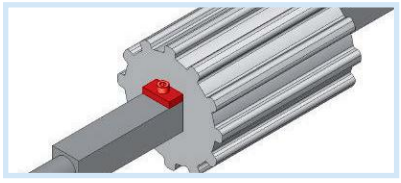
Additional Options for Securing SuperDrive™ Pulleys

Volta offers two alternative methods of securing pulleys to a shaft.
We recommend checking with your engineering department regarding the effects this will have on the conveyor shafts. Volta does not supply materials for this procedure and is not is responsible for damage to/or weakening of the shaft when using one of these options.



1. Drill and thread a hole at either end of the pulley. Mount an Allen screw in each hole to secure the pulley.





2. Mount a small piece of flat metal on either end of the pulley. Drill and thread a hole in the shaft and mount an Allen screw to secure the metal pieces.

Locking Collars

Pulley Outside Diameter	SuperDrive™ Pulley Description	Plastic Round Collar	Round Corner Plastic Round Collar	Plastic Square Collar	Round Corner Plastic Square Collar	Plastic Square Collar	Plastic Square Collar	Stainless Steel Collar
								
		Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 2"/50mm Face Width-20mm/ 0.78"	Bore size 2.5"/ 63.5mm	Bore size 1.5"/40mm
3.96"/100.5mm	SD Drive/Tail/Support Pulley 8T 1.5"/ 40mm	✓						✓
	SD RC Drive/Tail/Support Pulley 8T 1.5" Drive		✓					✓
5.96"/151.4mm	SD Drive/Tail/Support Pulley 12T 1.5" / 40mm	✓		✓				✓
	SD RC Drive/Tail/Support Pulley 12T 1.5"		✓		✓			✓
	SD Drive/Tail/Support Pulley 12T 2"					✓		
	SD Drive/Tail/Support Pulley 12T 2.5"							
7.98"/202.9mm	SD Drive/Tail/Support Pulley 16T 1.5" / 40mm	✓		✓				✓
	SD RC Drive/Tail/Support Pulley 16T 1.5"		✓		✓			✓
	SD Drive/Tail/Support Pulley 16T 2"					✓		
	SD Drive/Tail/Support Pulley 16T 2.5"						✓	
10.01"/254.3mm	SD Drive/Tail/Support Pulley 20T 1.5" / 40mm	✓		✓				✓
	SD RC Drive/Tail/Support Pulley 20T 1.5"		✓		✓			✓
	SD Drive/Tail/Support Pulley 20T 2"					✓		
	SD Drive/Tail/Support Pulley 20T 2.5"						✓	

Pulley Outside Diameter	Mini SuperDrive™ Pulley Description	Plastic Round Collar	Round Plastic Square Collar	Stainless Steel Collar	"C" Ring	Keyway
						
		Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 1.5"/40mm Face Width-20mm/0.78"	Bore size 1.5"/40mm	Circlip 471	Keyway bXh
1.89"/48mm	MSD Drive/Support 6T 3/4" SQB				Circlip 471-26	
	MSD Drive/Support 6T 20 MM SQB				Circlip 471-27	
	MSD Drive/Tail/Support 6T 1" RB				Circlip 471-25	1/4" X 1/4"
	SD Drive/Tail/Support 6T 25mm RB				Circlip 471-25	8 X 7
2.56"/65mm	MSD Drive/Support 8T 1" SQB				Circlip 471-36	
	MSD Drive/Support 8T 25 MM SQB				Circlip 471-25	
	MSD Drive/Tail/Support 8T 1" RB				Circlip 471-25	1/4" X 1/4"
	MSD Drive/Tail/Support 8T 25mm RB				Circlip 471-25	8 X 7
3.15"/80mm	MSD Drive/Support 10T 1.5" SQB			✓	Circlip 471-55	
	MSD Drive/Support 10T 40 MM SQB			Tail & Support only	Circlip 471-56	
	MSD Drive/Tail/Support 10T 1" RB				Circlip 471-25	1/4" X 1/4"
	MSD Drive/Tail/Support 10T 25mm RB				Circlip 471-25	8 X 7
3.8"/ 96.5mm	MSD Drive/Support 12T 1.5" SQB	✓		✓	Circlip 471-55	
	MSD Drive/Support 12T 40 MM SQB	✓		✓	Circlip 471-56	
	MSD Drive/Tail/Support 12T 1" RB				Circlip 471-25	1/4" X 1/4"
	MSD Drive/Tail/Support 12T 25mm RB				Circlip 471-25	8 X 7
6.07"/154.3mm	MSD Drive/Support 19T 1.5" SQB	✓	✓	✓	Circlip 471-55	
	MSD Drive/Support 19T 40 MM SQB	✓	✓	✓	Circlip 471-56	

5. Motorized Pulley

A motorized pulley (or drum motor) is an assembly with a motor, gearbox and shaft sealed inside a metal shell. The motor transmits power through the gearbox, which is coupled to a geared rim fixed to the drum end housing.
The sealed casing makes the assembly impervious as well as resistant to liquids in process as well as to high pressure cleaning.
An added benefit when using a motorized pulley in conjunction with SuperDrive™ is that this forms a completely hygienic conveying system that is easily cleaned.
Volta cooperates with the major motorized pulley manufacturers to develop toothed outer rings on the drums that correspond to the Volta Positive Drive pulleys including those for SuperDrive™ and Mini SuperDrive™.
Drum motors with a sprocket ring fabricated from UHMW will allow the same correct operation with all Volta Positive Drive belts as per the given belt specifications (loads, temperatures, humidity and speed).

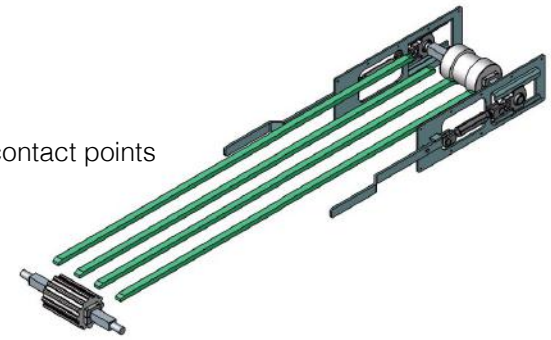
Please contact Volta Belting representative for more information.

6. Conveyor Construction

Classic Conveyor Construction

The classic conveyor construction consists of the following parts:

- Volta Drive Pulley
- Slide Bed made of UHMW(PE-1000) strips - to minimize friction at all contact points
- Tail Pulley with Take-up Device (Tensioner)
- Additional support pulleys depending on the belt width and the projected load (see Belt Calculations on Page 40)
- Return Rollers
- Snub Rollers when needed



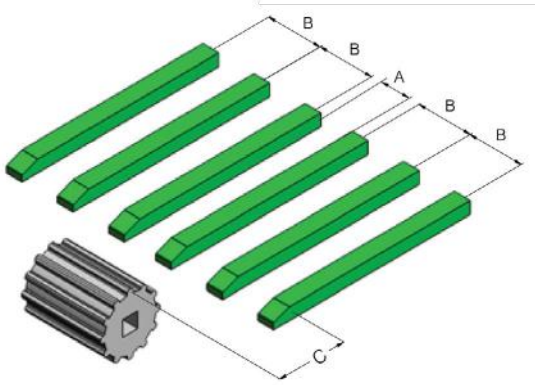
- If a stainless steel bed is required, note the high friction between the two surfaces may affect the adhering capacity and tracking of the belt. Please contact your Volta representative for construction recommendations and for pull force calculation.

Prior to installation on a conveyor, the belt path should be thoroughly examined, on the slide bed, around the pulleys and on the belt return, to ensure that all these areas are free from catch points that can snag the belt. This includes any side wall or other extraneous areas where the belt might come into contact during normal use due to minimal sideways movement. All the contact areas (slide bed, pulleys and return supports) must be chamfered and/or rounded to avoid any sharp edges from grooving or even scratching the belt surface (top and bottom) when loaded and moving. This examination should be repeated periodically as part of the regular maintenance procedure.

In particularly long conveyors with heavy loads the use of roller Slide Bed as shown on Page 30 is recommended. Many conveyors have a special construction that allows a complete and quick removal of the belt without using lace.

Suggested Conveyor Slide Bed Construction with UHMW Strips

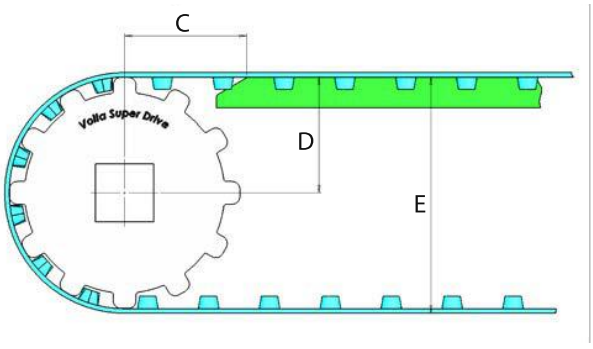
1. Recommended Dimensions for SuperDrive™ & Mini SuperDrive™ Belts with One Row of Teeth:



A. Distance between Guide Strips for the belt teeth: 85mm (3.35").

B. Distance between Support Strips:
A100-150mm (4-6"). Add strips depending on product size and weight, and for higher loads.

C. The distance of the front edge of the slide strip from the pulley depends on the cross section of the slide strip and the slide strip supports. Dimension 'C' should be kept to a minimum but still leaving dimension 'X' with a minimum of 20mm.

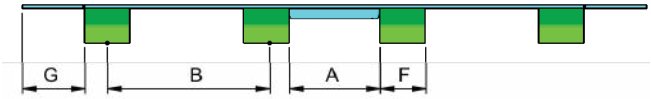


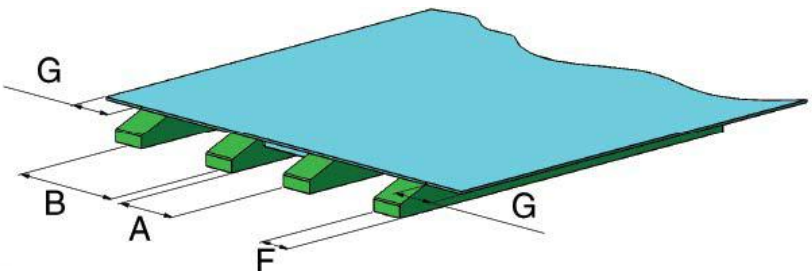
D. Distance between Drive Pulley Centre and Strip Surface: half of the drive pulley diameter.

E. Distance between Slide Bed Surface and Return Bed Surface at 180° contact engagement between the belt and pulley: pulley pitch diameter (= pulley diameter + belt thickness).

F. Strip width: 25-50 mm (1-2").

G. Maximum distance between the belt edges and strip: 50mm (2").



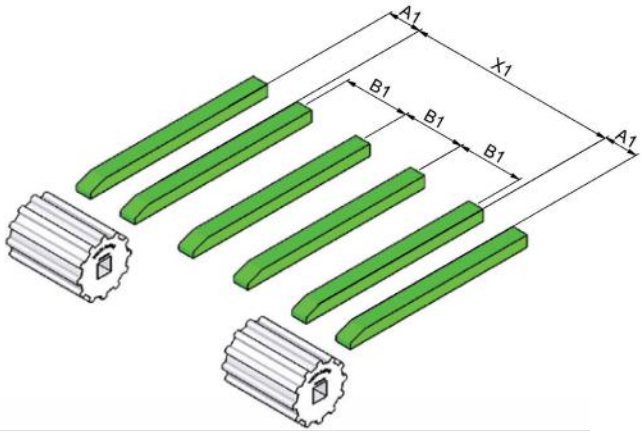


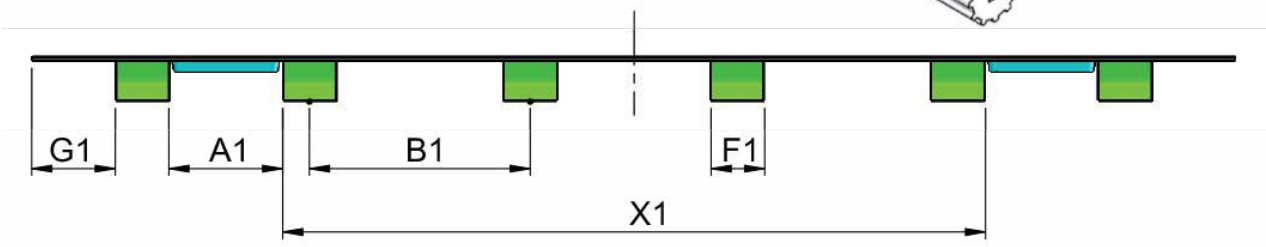
2. Recommended Dimensions for SuperDrive™ and Mini SuperDrive™ Belts with Two Rows of Teeth Suitable for Both 'H','DR' and 'M' Material Family Belts.

A1. Distance between Guide Strips for the belt teeth: 89mm (3.5").

B1. Distance between Support Strips: 100-150mm (4-6"). Add strips depending on product size and weight, and for higher loads.

X1. Total distance of the Support Strips between the two Guide Strips.
For SuperDrive™: X1=520mm / 20.47"
For Mini SuperDrive™: X1=407mm/16.02"





F1. Strip width: is 25-50 mm (1-2").

G1. Maximum distance between the belt edges and strip: 50mm (2").

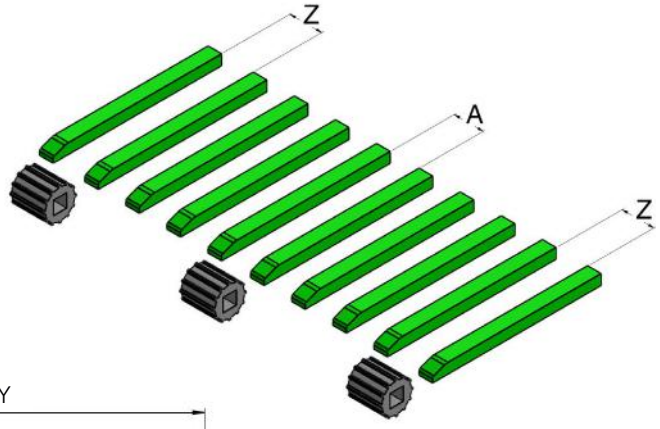
3. Recommended Dimensions for SuperDrive™ Belts with Three Rows of Teeth Suitable for 'H','DR' and 'M' Material Family Belts.

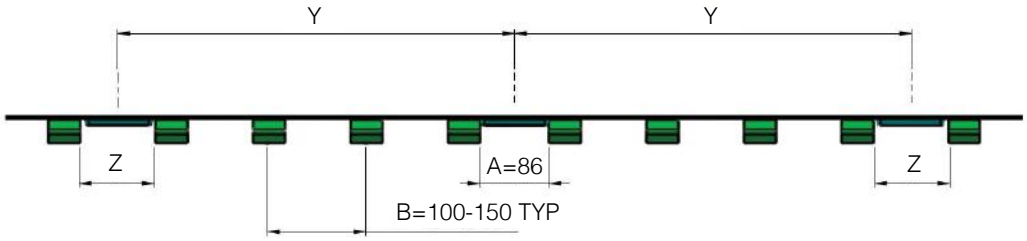
A. Distance between Guide Strips for the middle belt teeth row: 86mm (3.39").

B. Distance between Support Strips: 100-150mm (4-6"). Add strips depending on product size and weight, and for higher loads.

Y. Distance between Center lines of the Guide Strips Spacing for the Belt teeth.

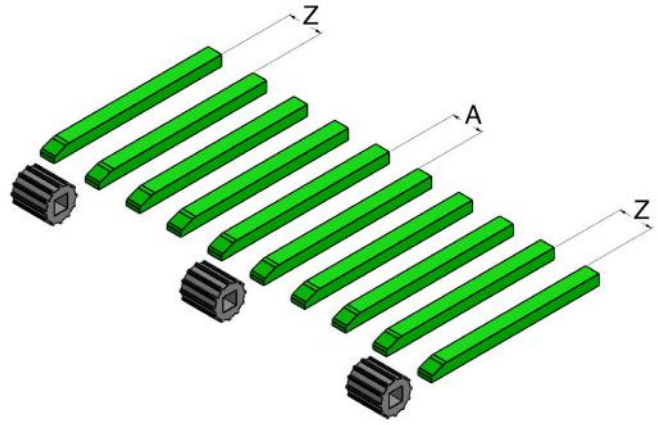
Z. Distance between Guide Strips for the two outer belt teeth rows.





Supported Belts	Dimension "Y"	Dimension "Z"
SD MB & HB materials together	609mm/23.98 inch	94mm/3.70 inch
SD MB materials only	613mm/24.13 inch	86mm/3.39 inch
SD HB materials only	605mm/23.81 inch	86mm/3.39 inch

4. Recommended Dimensions for Mini SuperDrive™ Belts with Three Rows of Teeth.

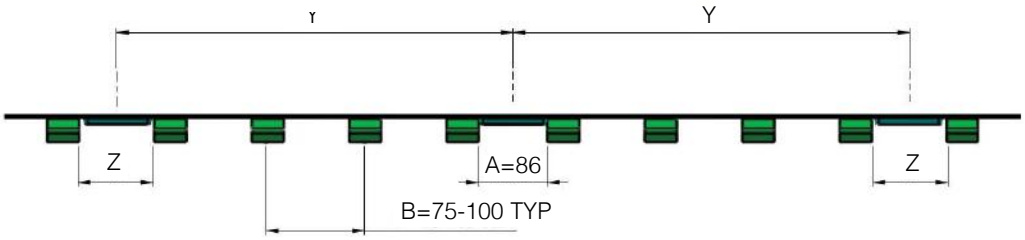


A. Distance between Guide Strips for the middle belt teeth row: 86mm (3.39").

B. Distance between Support Strips: 75-100mm (3-4"). Add strips depending on product size and weight, and for higher loads.

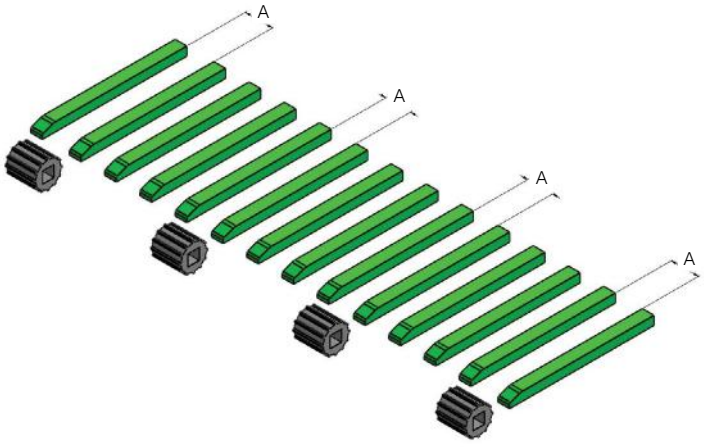
Y. Distance between Center lines of the Guide Strips Spacing for the Belt teeth.

Z. Distance between Guide Strips for the two outer belt teeth rows.



Supported Belts	Dimension "Y"	Dimension "Z"
MSD MB material	500mm/19.69 inch	86mm/3.39 inch

5. Recommended Dimensions for Mini SuperDrive™ Belts with Four Rows of Teeth.



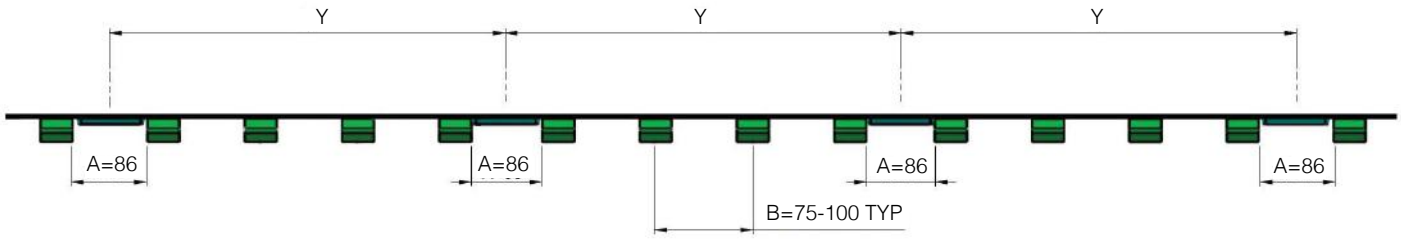
A. Distance between Guide Strips for the belt teeth: 86mm (3.39").

B. Distance between Support Strips: 75-100mm (3-4"). Add strips depending on product size and weight,and for higher loads.

Y. Distance between Center lines of the Guide Strips for the belt teeth.

Supported Belts	Dimension "Y"
MSD MB material	500mm/19.69 inch

Note: Tolerance for dimension "Y": +/- 1.5mm.
For larger tolerance,enlarge dimension A to 89mm.

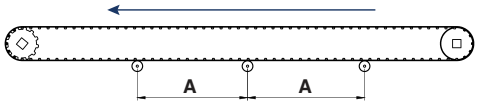


How to Drive the Belt

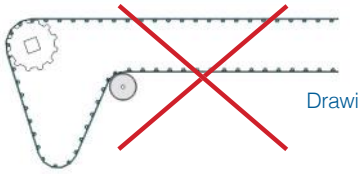
A Belt is driven by first ensuring that the belt drive teeth are engaged with the drive pulley. This is achieved by one or more of the following methods:

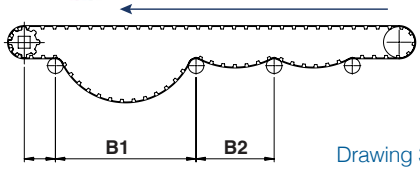
- Minimal pre-tensioning (up to 0.50% maximum);
- Controlling the catenary sag by means of a suitable return way design and / or with a snub roller.

The design should prevent belt slack occurring in the area where the belt wraps around the drive pulley in order to ensure that the belt teeth do not disengage during operation (See Drawing 2). One must ensure a consistent arc of contact.
Pre-tensioning, Drawing 1, suits most of the applications and conveyor designs as long as the loads are not on the high end of the belt specifications. The use of return ilder design to control catenary sag as shown in Drawing 3, and the use of a snub roller adjacent to the pulley as an alternative or additional measure is commonplace in conveyor design. One or more of these features is essential in applications where the belt length is expected to vary due to one of the following situations: a high product load; a wide temperature range; a relatively long conveyor.



Drawing 1


Drawing 2



Drawing 3

Take-up Device and Quick Release

The Take-up Device performs a number of functions on the conveyor. It enables the use of minimal, measured pre-tensioning; it facilitates the mounting and disassembly of the belt and it enables the use of extra belt length to simplify belt splicing.
The length of belt take-up allowed by a belt quick release take up device and its construction depend on the conveyor length, the cleaning method and the overall conveyor structure. Volta recommends using a minimum take-up of at least 5-8 inches (125-200 mm) in any case.
A quick release mechanism added to the take-up device means that a belt is returned to the same level of tensioning when released and repositioned for cleaning or conveyor maintenance. This belt allows to be lifted to provide easy and effective access to the underside of the belt as well as the guides and pulleys, for cleaning. After cleaning has been completed, the quick release take-up device can be re-engaged in order to return the belt to its correct pre-tension and alignment without additional adjustments.

Return Way

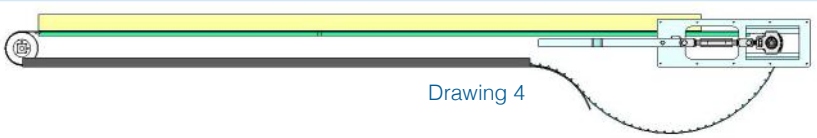
Return roller design is shown in Drawing 3: Volta recommends 1m (3ft.) spacing between the rollers and depending on the application a maximum distance of 1.5 meters (5ft). Note that if a belt is pre-tensioned (up to 0.50% maximum), the belt can sag due to its own weight. Take great care not to over-tension the belt. For longer conveyors with multiple catenary sags, recommend to vary the support roller spacing: adjacent spacing gaps not to be identical length, to reduce oscillation of the belt on the return way. Once the belt runs under load, additional sagging is expected. Control that there is no sagging directly under the drive sprocket causing disengagement and also ensure that the sag does not contact with any part of the conveyor or other structures such as collecting pans or the floor.
Channeling the belt sag by correct spacing of return rollers:
Return rollers should be placed to allow for belt accumulation to occur in a specific location or locations. The belt will tend to sag in the larger spacings on the return (B1; B2). On a decline conveyor, the sag can be expected to accumulate at the lower end. Smaller spacing seen at position "A", relatively to B1/B2, will help avoid sagging under the drive sprocket.

Snub Rollers

Snub Rollers are widely used to increase the arc of contact on the drive pulley, eliminating slack which can cause the drive teeth to disengage (“jumping”). Safety precautions must be taken to prevent access to the area where the snub roller is located.

Return Rails Design

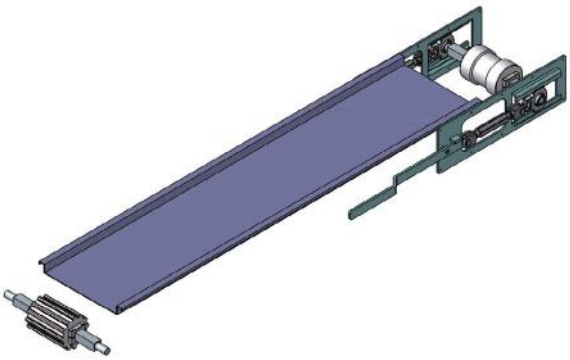
Return rails are a possible design option although rollers (idlers) are the preferred option. Return rails allow the belt to rub that increases friction and this is a cause of potential wear on the belt work surface. Plan an area for the belt to sag and accumulate any extra length due to high loads; wide temperature range; relatively long conveyors. To permit a section of belt to sag, the return rails should not support the belt on the entire return way from drive to end idler shaft. It is important to plan a large radius at the end of the rails where the belt is allowed to sag as shown in Drawing 4.
The use of return shoes is by way of a design similar to that used for return rollers. The shoes should be made from UHMW to reduce the friction and thus the wear on the belt surface. As they are stationary elements, shoes have the same disadvantage as rails regarding potential wear on the belt surface.


Drawing 4

Conveyor Retrofit

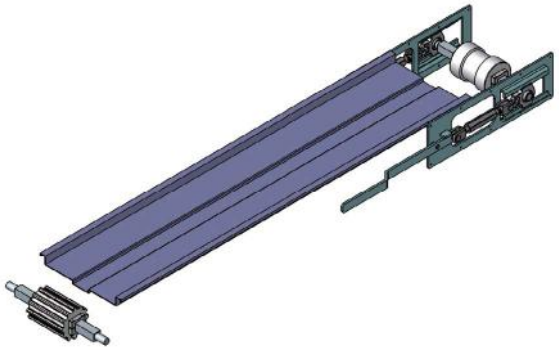
Retrofit of Conveyor with a Flat Slide Bed

These conveyors typically have outside walls. In this case strips are not necessary to guide the belt teeth (remember that the belt should not press against either one of the conveyor walls).
Several options for retrofit are available:



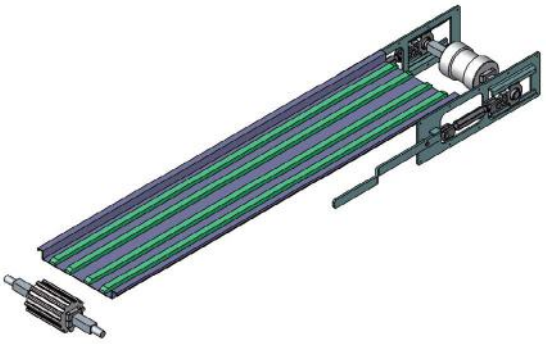
1. Flat Slide Bed

The teeth can ride on the flat Slide Bed without affecting the belt operation. In this case, because of the SuperDrive™ teeth, the center line of the belt will be slightly higher than the edges of the belt. This construction is not recommended with 'DR'/ 'M'/'MD'/'LT'/'Z' material belts.



2. Slide Bed with a groove to accommodate SuperDrive™ teeth

When a groove is added to the Slide Bed the belt operation becomes smoother and more efficient. In this case the belt will be guided by its teeth in the center groove and it should not touch the conveyor bed sidewalls. This construction is not recommended with 'DR'/ 'M'/'MD'/'LT'/'Z' material belts in applications with heavy loads and long conveyors.

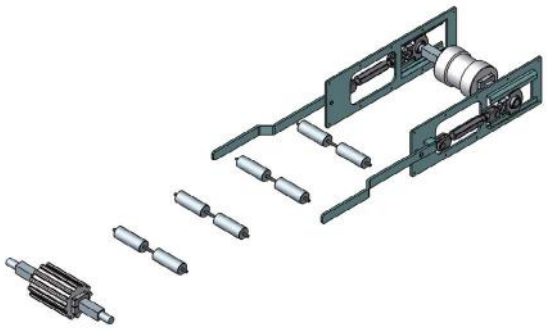


3. Slide Bed with UHMW (PE-1000) strips

Slide Bed as seen in accompanying drawing is the most recommended type, especially for 'DR'/ 'M'/'MD'/'LT'/'Z' material belt applications. The UHMW (PE-1000) strips reduce the coefficient of friction between the belt and the Slide Bed. This increases the carrying capacity of the belt. In this case, it may be necessary to raise the position of the drive and tail pulleys.

Retrofit of Conveyor with a Roller Slide Bed

This type of conveyor is not typical of food applications. If you wish to install a belt on a roller bed conveyor, use rollers with grooves in order to guide the teeth and allow a smooth belt operation.
Stainless Steel Slide Bed is least recommended especially when using 'DR'/'M'/'MD'/'LT'/'Z' belts.



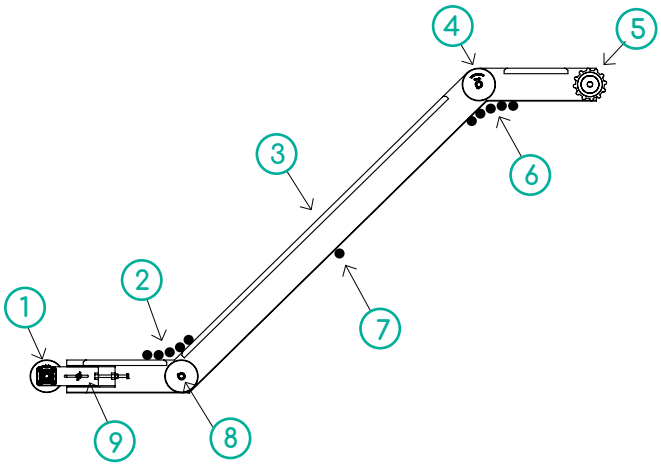
‘Z’ or Swanneck Conveyor Construction

The “Z” or swanneck conveyor is commonly used for lifting products.
The SuperDrive™ (SD) and Mini SuperDrive™ are suited for this designs for several reasons:

- The SuperDrive™ and Mini SuperDrive™ material is relatively stiff across the belt and will not bend in the middle when the belt changes from a horizontal to an angled position.
- The SuperDrive™ operates without tension, therefore, reduces problems of holding the belt in place.
- The transition areas (horizontal to elevation and back) can be assisted as for traditional belts, by using a single large roller or a set of small rollers (see drawing below).

UHMW Strip Bed Construction

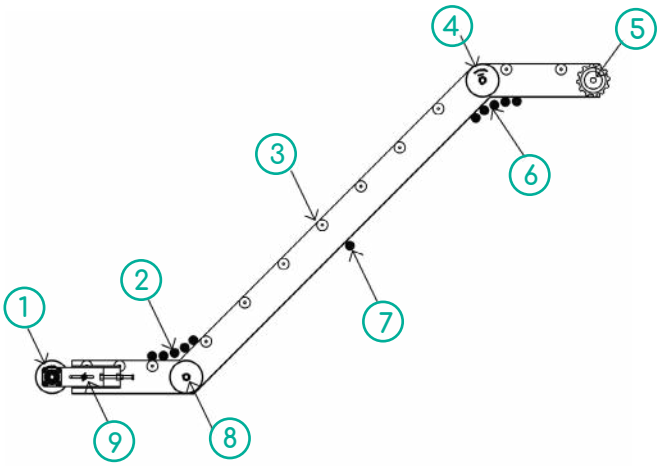
Figure 1



1. Tail Pulley
2. Roller Set: Transition Horizontal to Incline
3. Incline UHMW (PE-1000) Slide Bed
4. Top Roller: Transition Incline to Horizontal
5. Drive Pulley
6. Roller Set: Return transition horizontal to decline
7. Return Support Roller
8. Bottom Roller: Return transition decline to horizontal
9. Take-up Device (Tensioner) for tail pulley

Roller Bed Construction

Figure 2



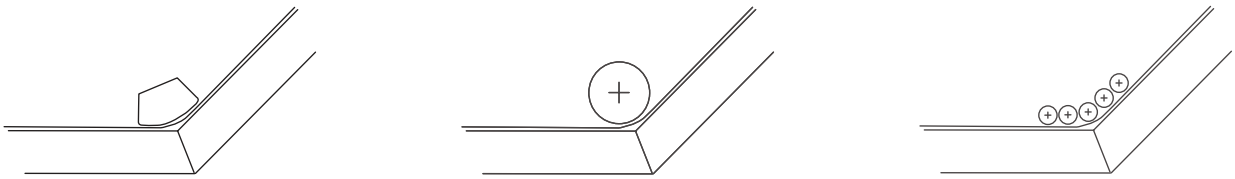
1. Tail Pulley
2. Roller Set: Transition Horizontal to Incline
3. Roller Slide Bed
4. Top Roller: Transition Incline to Horizontal
5. Drive Pulley
6. Roller Set: Return transition horizontal to decline
7. Return Support Roller
8. Bottom Roller: Return transition decline to horizontal
9. Take-up Device (Tensioner) for tail pulley

- Figure 1 & 2 demonstrate typical Z-elevator conveyor constructions with Fig.1 showing a Slide Bed made from UHMW (PE-1000) and Fig 2 showing a roller Slide Bed. In applications with heavy loads & long conveyors it isadvantageous to use the roller Slide Bed type (Fig. 2) especially when using ‘DR’/‘M’/’MD’/’LT’/’Z’ type belts.

  In transition areas (2 & 4) – the belt will tend to rub against the conveyor’s curved construction and to create an area of high tension strain and friction. Therefore, it is recommended to use rollers on position 2 and Tail+ Support pullies on position 4 to minimize the strain and friction.

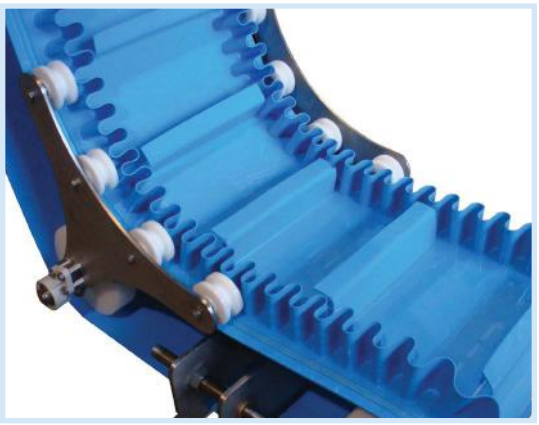
There are 3 Typical Options for the Transition Areas

- The belt curve should be the maximum possible size and not less than the minimum pulley diameter of the specific belt with its fabrications. The bigger the curve, the less wear and tear. It is easiest to apply the roller set to larger curves.
- Roller systems for transitions are best to insure the most optimal performance but a shoe system can be considered. If opting for a shoe system, please consult with a Volta representative to discuss details of the application.



Swan-neck conveyor - transition rollers/ shoe (direction change) options

- For SuperDrive™ belts 600mm or wider and Mini SuperDrive™ belts 450mm or wider, we recommend using guides on both upper edge sides of the belt. The belt guides go through the v-grooved rollers in the transition section to hold the belt (see the picture).

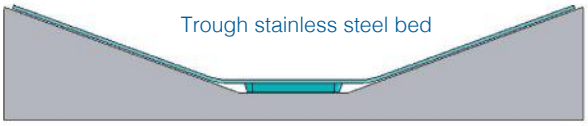


- When using wide belts, it is very important to support the belt on the return side. Using flights may cause problems and it may be necessary to make a center gap in the flight to enable supporting the belt.

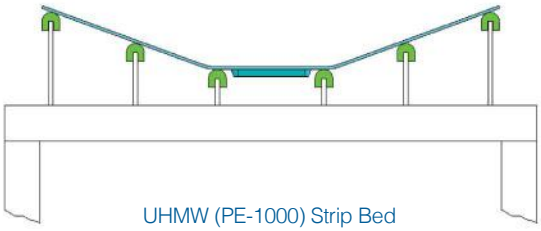
Trough Conveyors

The SuperDrive™ belt can be used in trough conveyors. The belt teeth are usually positioned at the center of the belt. When designing the trough conveyor allow enough space for the belt teeth to lay flat.

Trough Bed Construction



Roller bed construction

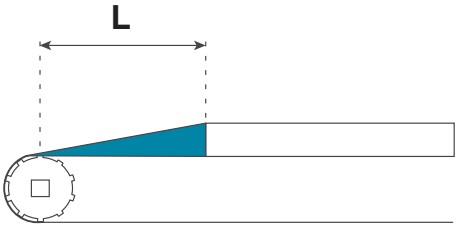


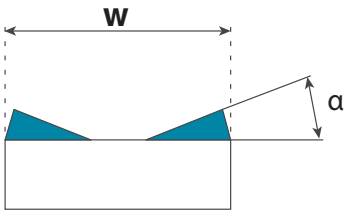
UHMW (PE-1000) Strip Bed

Transition Length

There must be a minimum distance between the drive/ tail pulleys and the beginning of the trough since high tension is created on the belt sides and edges. This distance is called the transition length and is measured from the pulley centers at both ends of the conveyor.

Transition length (L)





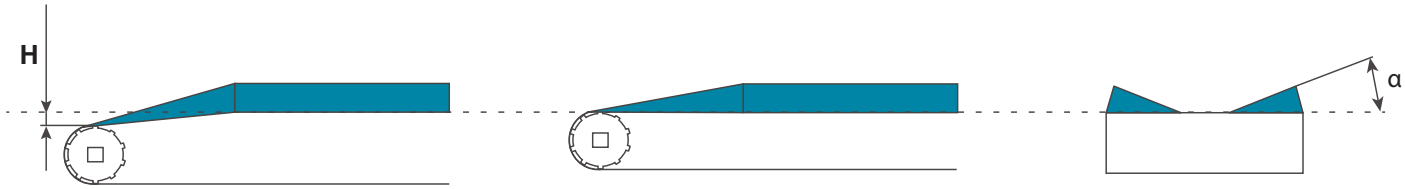
L = C * W **L** - Transition length = **C** - Factor from table* **W** - Belt width

Trough Angel	10°	20°	30°	45°
C Factor	1	1.5	1.5	2

The Pulley Construction and Height Location

Due to the strain on the belt sides and edges, it is very important to use support pulleys to hold at least 80% of the belt underside, particularly at the edges.

The drive and tail pulleys should be placed at the full trough depth or 20 - 40 mm/ ¾ " - 1½" lower than the trough base depending on the conveyor construction and the belt width. This will enable the belt to take the trough shape when the load is low or the belt is relatively narrow or short.



Pulley lower than the trough depth

Pulley at the full trough depth

Full trough depth

Belt Tension

The belt used on a trough conveyor must be pre- tensioned to 0.3 - 0.5% so that the belt takes the trough shape.

Allowed Belt Trough Angle for 3mm Thick "H" Material Family Belts

Belt Width / Trough Angle	300 mm/12”	400 mm/16”	500 mm/20”	600 mm/24”
10°	NO	YES	YES	YES
20°	NO	YES	YES	YES
30°	NO	YES	YES	YES
45°	NO	*	*	*

Note: Discuss trough angle with your local Volta Belting representative when choosing thicker SuperDrive™ belt.
For Mini SuperDrive™ data please consult your local Volta Belting representative.

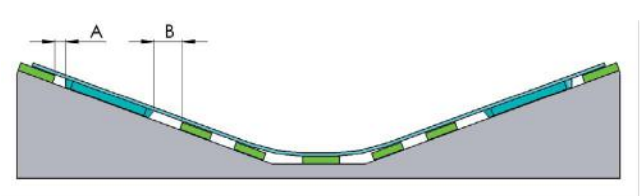
Allowed Belt Trough Angle for 3mm Thick "DR" & "M" Material Family Belts

Belt Width / Trough Angle	300 mm/12”	400 mm/16”	500 mm/20”	600 mm/24”
10°	*	YES	YES	YES
20°	*	YES	YES	YES
30°	*	YES	YES	YES
45°	*	*	YES	YES

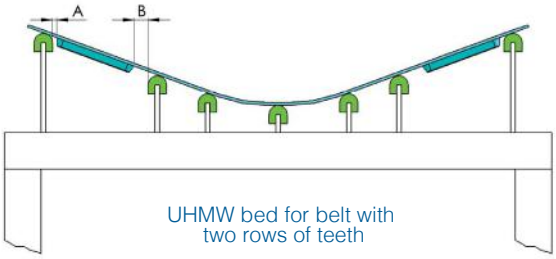
Note: * When loaded, the belt will take the trough shape.
6 mm thick SuperDrive™ belt cannot be used for Trough conveyors.
For Mini SuperDrive™ data please consult your local Volta Belting representative.

- One method for ensuring a stiff belt takes up the trough form is to restrict it by means of a series of short ‘shoes’ positioned along the conveyor length. Each shoe contains and restricts the outer part of the belt from above and below to prevent buckling or deforming while pressing the belt edge at the same time into the troughing.
  The shoes should be made from UHMW and the lower part under the belt should be longer than the upper part.

Construction of Trough Conveyor when Using SuperDrive™ Belt with Two Rows of Teeth



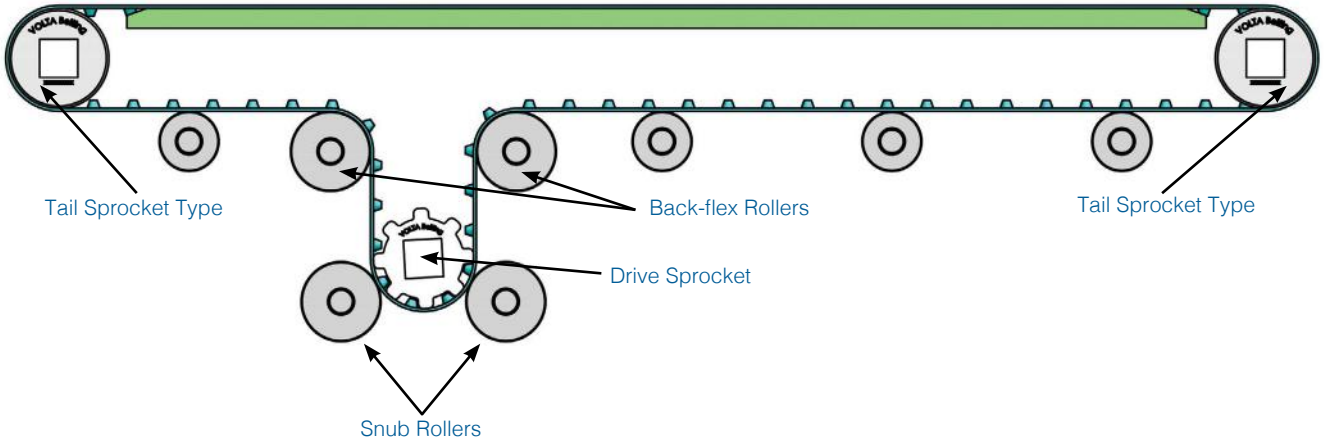
Trough stainless steel bed for belt with two rows of teeth



UHMW bed for belt with two rows of teeth

- The same principle as for a belt with one row of teeth should be taken into consideration when strips are used to support a belt with two rows of teeth. It is important to leave a gap between the belt teeth and the nearest strip to the center side (B) to enable the belt to take the trough shape. The belt can be guided by the strips on the teeth closest to the outer side (A). When adding UHMW strips on an existing frame (see figure above), the strips should be at least 10 mm (3/8") high.

Center Drive Conveyor



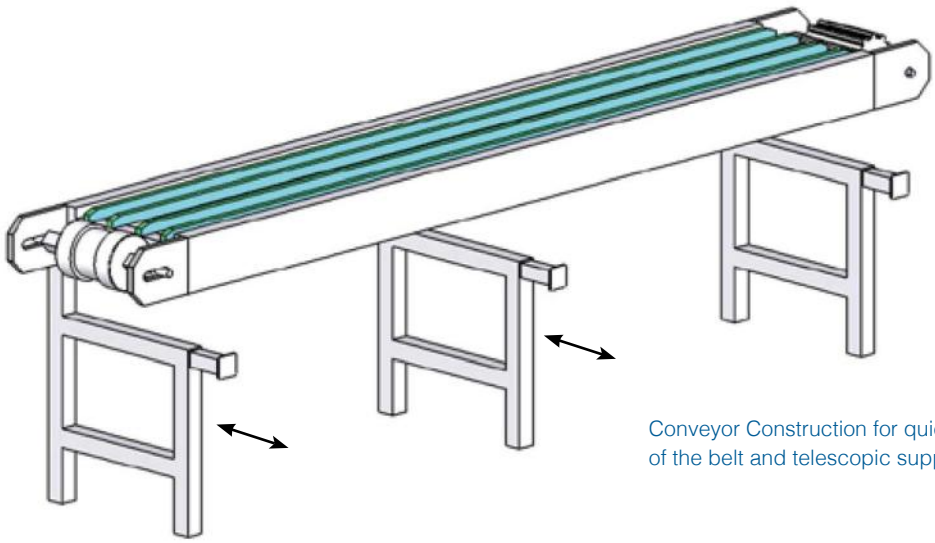
This conveyor is used in two typical applications:

- One option is when the drive pulley is large, the tail pulley can be much smaller within the limitations of the minimum pulley diameter of the base belt making the conveyor most suitable for tight transition of products.
- Another option is when the conveyor works in two directions. In this case add two snub rollers as shown to ensure smooth operation. In most cases, snub rollers are placed both before and after the drive pulley, positioned tightly against the drive pulleys on both sides. This ensures smooth operation when the belt is running in both directions.

Removing the Belt for Cleaning

There are a number of options in the conveyor construction that allow the belt to be removed from the conveyor without being opened.

- Quick Release Take-up Device (Tensioner) - This device permits the release of belt tension without losing belt alignment (Page 29). In some conveyors telescopic supports are used. During normal operation of the conveyor, the supports are flush with the sides of the conveyor. During cleaning or maintenance, the supports are pulled out and are in a position to hold the conveyor belt during cleaning and maintenance (see drawing).
- The Hinge Lace, RoundFlex™ Lace or a mechanical fastener can be used to open the belt for cleaning and maintenance (Page 37).

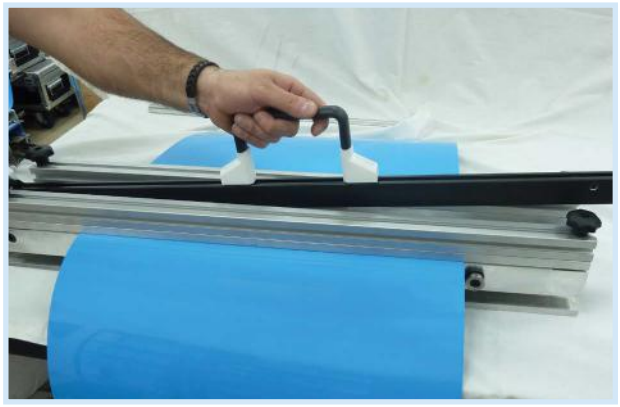


Conveyor Construction for quick dismounting
of the belt and telescopic supports to hold the belt

7. Splicing the SuperDrive™ and Mini SuperDrive™

The SuperDrive™ and Mini SuperDrive™ conveyor belt is extruded with a series of teeth as an integral part of the belt. These teeth are designed to mesh with the teeth on the Super-Drive™ and Mini SuperDrive™ drive pulley. To ensure efficient performance, it is necessary to maintain the spacing between the teeth in the region of the weld.

We recommend using Volta Tools for this procedure. These tools are designed for use with all our belts and materials. They are also designed to maintain the correct spacing between the teeth on the SuperDrive™ and Mini SuperDrive™ belt.



FBW PD & Mini - Flat Butt Welding

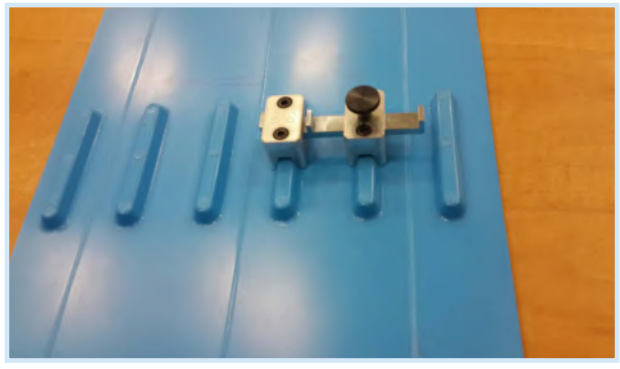
The FBW PD&Mini System was created to butt-weld the belts endlessly. The FBW Welding System can be used for flat belts, SuperDrive™, 1" Pitch belts (Mini SuperDrive™ & Mini DualDrive™) DualDrive™. Adapters are available for welding special textured top flat belts. The FBW tool range offers maximum splicing width up to 2300mm/90.5".

FT - Electrode Welding Kit

For the FT Welding System extruded electrodes are used to endless splice Volta flat belts and SuperDrive™, DualDrive™,1" Pitch belts (Mini SuperDrive™ & Mini DualDrive™). The FT Welding System uses a router bevel the belt edges and to trim the excess weld on comple- tion. The weld done with a Leister Hot Air Gun and Volta electrodes. When welding 2mm thick belts, use the 7mm section electrode and for thicker belts use 9mm section electrode. This tool is supplied with a built-in adaptor for welding SuperDrive™ belts. The FT tool range offers maximum splicing width of 1000mm/39.4" and 1500mm/60".

Pitch Gauge Measuring Tool for Volta Positive Drive Belts

Volta Positive Drive belts need to be welded endlessly while maintaining a correct pitch tolerance between the teeth closest to the weld. A tool has been developed to ensure this.
The Pitch Gauge Measuring Tool is not included in the FBW Welding kit. This tool can be purchased as a separate unit - Cat.No. - 81307570.



Volta Hinge Lace Systems

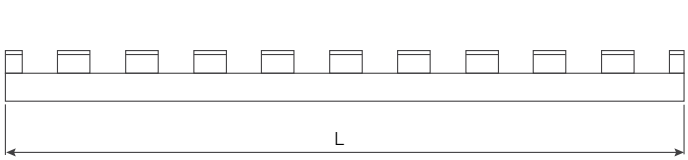
The Plastic Hinge Lace allows you to easily open the belt by removing the hinge pin. The belt should be closed after each refitting with a new pin. The Plastic Hinge Lace is made of Volta homogeneous food approved materials and is compatible with Volta M family product belts from 2.5mm to 5mm thickness. Volta belts are renowned for their homogeneous and hygienic characteristics and, therefore, they do not require opening and joining on a regular basis- unlike modular belts. Welding instructions for the Volta Laces are included in our FBW (Flat Butt Welding) tool instruction manual.

Hinge Lace Benefits

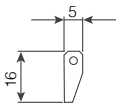
Easy Open-Close Technique

The fastening structure allows you to easily open both the Universal Lace and the Roundflex™ Lace by removing the hinge pin from the lace. After setting up the belt on the conveyor, fasten the lace and secure it by inserting a new hinge pin into the slit and crimp up the pin ends.

Universal Lace : LMW-U & LMB-U

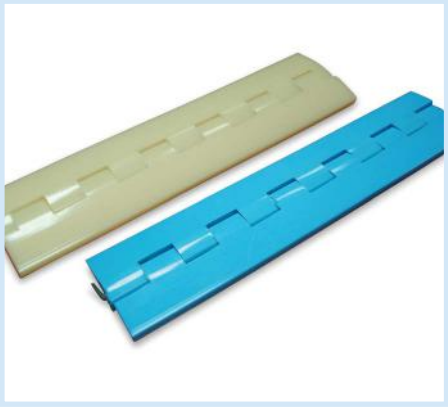


Maximum Length (L): 3.05 m (10ft.)

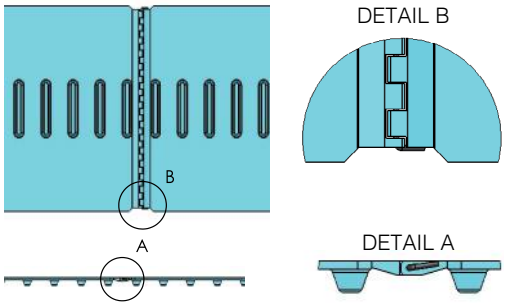


Dimensions: 5 x 16mm (0.2" x 0.63")

Closing belt with Universal Lace



Universal Lace



Universal Lace Specifications

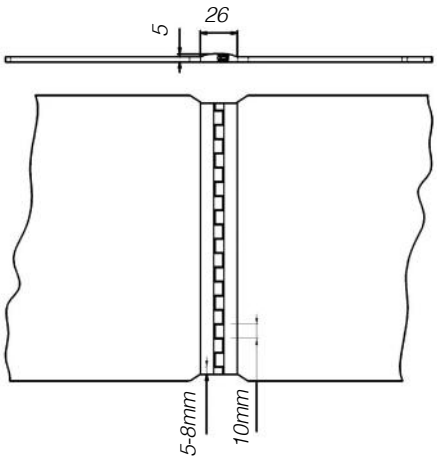
Lace & Belt Type	Volta LMW-U and LMB-U with SuperDrive™		Volta LMB-U with Mini SuperDrive™	
Description	Flat toothed strip		Flat toothed strip	
Material	Volta MW, Beige - Volta MB, Blue		Volta MB, Blue	
Hardness	95A		95A	
Working Temp Range	-20°C to 60°C/ -5°F to 140°F		-20°C to 60°C/ -5°F to 140°F	
Dimensions	5 x 16 mm - 0.2in x 0.63 in		5 x 16 mm - 0.2in x 0.63 in	
Maximum Length	3.05 m - 10ft		3.05 m - 10ft	
Maximum Pull Force	3 kg/cm - 16.8 lb/in		3 kg/cm - 16.8 lb/in	
Minimum Pulley Normal Flex	80 mm - 3.15"		67 mm - 2.64"	
Minimum Pulley Back Flex	100 mm - 3.94"		80 mm - 3.15"	
Pin Options	Stainless Steel Pin coated with Nylon - 0.065"/1.65mm diameter	Cat. No.: 81651170	Stainless Steel Pin coated with Nylon - 0.065"/1.65mm diameter	Cat. No.: 81651170
	* Nylon (Plastic) Pin - 0.065"/1.65mm diameter with Stainless Steel leader	Cat No.: 81651130	* Nylon (Plastic) Pin - 0.065"/1.65mm diameter with Stainless Steel leader	Cat No.: 81651130
Certifications	FDA / USDA / USDA Dairy / EU Approved			

Note:* Maximum Pull force with the Nylon (plastic) Pin is 2 kg/cm (11.2 lb/in).

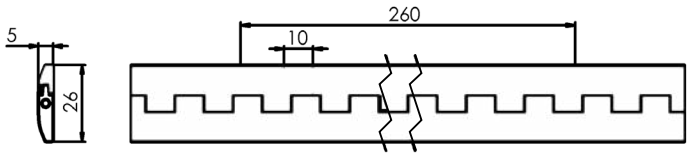
Roundflex™ Lace - LMB-R, LMW-R, LDR-R, LMD-R

The Roundflex™ Lace is made of Volta homogeneous food approved materials and is compatible with Volta DR and M family product belts.

Material:	**Volta (MB) Blue,Blue 02, (MW) Beige, (DR & LT) Blue 15,(MD) Blue 09**	
Working Range:	Suitable for belt thickness 2.5 – 5 mm	
Hardness:	95A	
Description:	Flat Toothed Strip	
Temp. Range:	-20°C to 60°C / -5°F to 140°F	
Certification:	FDA / USDA / EU	
Dimensions:	5 x 26mm (0.2" x 1.02")	
One Section Length (L):	260mm (10.23")	
Maximum Pull Force:	3kg/cm (16.8lb/in)	
Minimum Pulley Diameter **Normal Flex:** **Back Flex:**	Choose the highest MPD between the belt and the lace 80mm (3.15") 80mm (3.15")	
Pin Options:	NYLOSTEEL PIN - 2.4mm	Cat.No.: 81651172
	PLASTIC PIN - 2.4mm	Cat.No.: 81651176



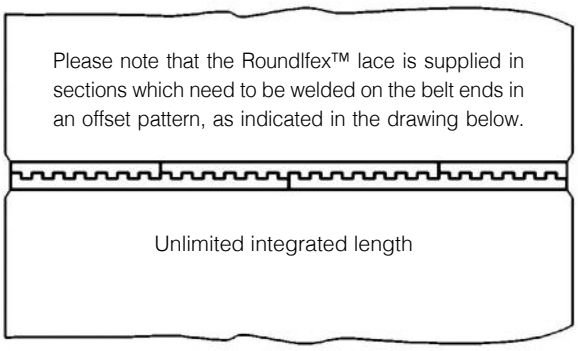
Note:* Maximum Pull force with the Plastic Pin is 2 kg/cm (11.2 lb/in).



Dimensions:
5 x 26mm (0.2" x 1.23")

One Section Length (L):
260mm (10.23")

Roundflex™ Lace



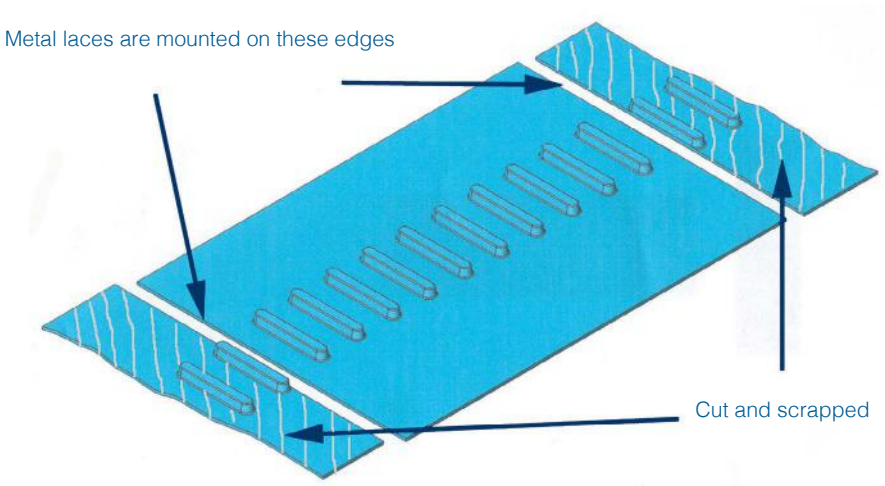
Reduced Maintenance Downtime

Volta belts are highly cleanable and do not need to be removed routinely for wash-downs even in high hygiene applications. In instances where removal is necessary, Hinge Lace reduces the risk of contamination to a minimum. The castellated lace is fabricated from homogenous belt material welded seamlessly on to the belt edges. The hinge pin may need replacing when the lace is opened.

We recommend using the Hinge Lace only when absolutely necessary. Make sure that the conveyor pulleys fully support the entire face length of the belt or at least 80% of the face length. Note that the maximum allowed pull force for the lace (per cm/ in.) is lower than the allowed pull force of the belt (per cm/ in.). Therefore, check that the calculated pull force of your belt is lower than the maximum allowed pull force of the lace.

Mechanical Fasteners

- There are occasions when it may be necessary to splice the SuperDrive™ and Mini SuperDrive™ belt using a Mechanical Fasteners.
- When working with fasteners, it is important that you work according to the manufacturer`s recommendations.
- When using fasteners for splicing the SuperDrive™ and Mini SuperDrive™ belt, the Pull Force calculations provided by Volta are not applicable.
- The distance between the teeth at the splice must be the same as the distance between the teeth on the rest of the belt.
- Volta takes no responsability for Metal Fasteners or joints conforming to hygienic requirements.



Note: The pitch between the driving lugs at the splice can be reduced for the SuperDrive™ up to 2-3mm and for the Mini SuperDrive™ up to 1mm, without adversely affecting belt operation. However, the distance between the teeth should never be increased.

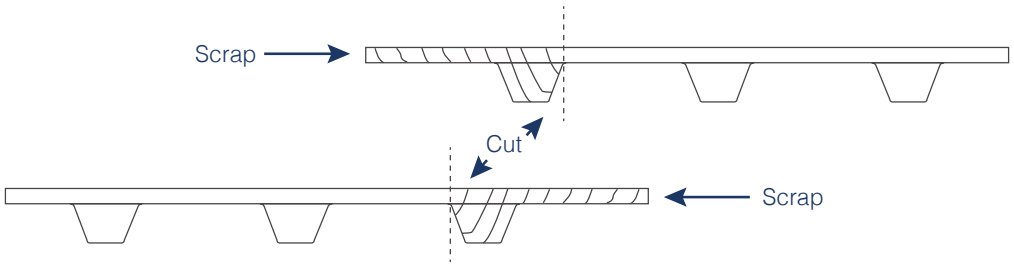


Figure 5a: Tooth pattern after joining the SuperDrive™ belt with lace

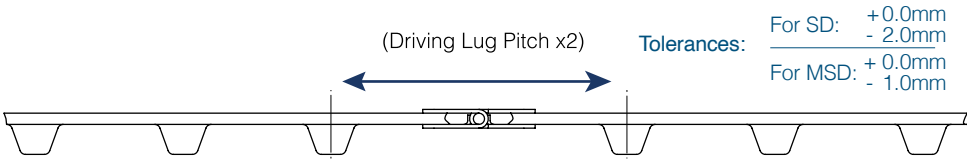


Figure 5b: Shows the correct spacing between teeth with one missing tooth

With some lace products, it may be necessary to remove one tooth completely. For these products, it will be necessary to cut each end of the belt according to the fastener`s properties. After mounting the lace, the belt will have a gap of one tooth (Figure 5b). The loss of one tooth will not affect the operation of the belt. We do not recommend using this method when using pulleys of 12 teeth or less.

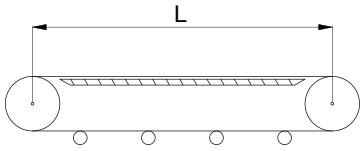
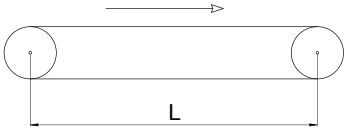
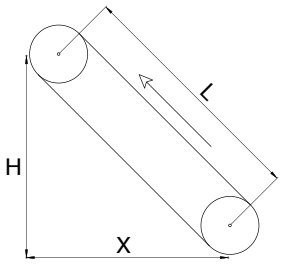
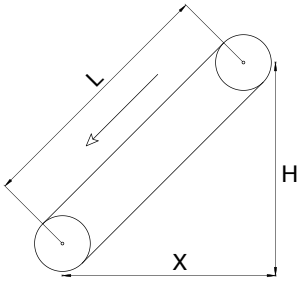
For detailed splicing instructions refer to "Flat Butt welding (FBW) Instruction Manual".

8. Belt Calculations

Pull Force Calculation Procedure

1. Net Pull Force F on the Belt is Calculated by the Formula

$$F = f_S * (G_1+G_2)* \frac{X}{L} + f_R * G_2 * \frac{X}{L} + f_R * G_3 + C * G_1 * \frac{H}{L} + 0.25 * G_4$$

<table>
<tr><td></td><td colspan="3">Conveyor with Slide Bed
  </td></tr>
<tr><td>Return Bed</td><td>Rollers with Bearings
f_R = 0.03</td><td>Rollers with Bushing
f_R = 0.1</td><td>UHMW Sliders
f_R = refer to Technical Data Sheet</td></tr>
<tr><td>Slide Bed</td><td colspan="3">fs = refer to Technical Data Sheet</td></tr>
<tr><td>1. Horizontal transport
  </td><td colspan="3">C = 0; L = X; H = 0</td></tr>
<tr><td>2. Incline
  </td><td colspan="3">C = 1</td></tr>
<tr><td>3. Decline
  </td><td colspan="3">C = -1</td></tr>
</table>

Symbols and Dimensions

fR = Coefficient of friction of rollers (Bearings or Bushing)
fS = Coefficient of friction of belt on Slide Bed
L = Conveyor length (m)/ (ft)
H = Elevating height (m)/ (ft)
X = Horizontal distance of conveyor (m)/ (ft)
G1 = Maximum load on the conveyor (kg)/ (Lb)
G2 = Belt weight (one direction) (kg)/ (Lb)
G3 = Weight of supporting rolls-upper and lower sections
(kg)/(Lb) G4 = Maximum accumulated weight (kg)/ (Lb)

* In case of Z Conveyor, the calculation is made up of two conveyors, one horizontal and one inclined.
In order to find the total Pull Force, add the results of both calculations.

2. Pull Force Per Unit Belt Width

Divide the Calculated Pull Force from Step 1 by the belt width (cm or inch.) and record the answer.

3. Determine Allowed Pull Force and Pulley Diameter

The Pull Force (PF) is affected by a combination of Load and Temperature.

Pulley Correction Factor

To determine the Allowable Pull Force (Fa) find the number of meshed teeth in the left hand column of Table 8a. If the number of meshed teeth is less than 6, multiply the Maximum Pull Force by Pulley Correction (Kp) Factor below.

Table 8a: Pulley Correction Factor (Kp)

Teeth in mesh	Kp Factor	Contents
6 or more	1	180° arc of contact at standard 150 mm/6”pulley
5	0.8	
4	0.6	180° arc of contact at standard 100 mm/4”pulley

Temperature Correction Factor

The recommended method of estimating operating temperature is to measure belt temperature at several points when fully loaded; at intake, out-feed and along the return cycle. For heavy loads at higher temperatures, the available (Pull Force) of a given belt thickness can be calculated following the correction factor below:

Table 8b: Temperature Correction Factor (Kt)

Belt material	Temperature														
	25°C/ 77°F	30°C/ 86°F	40°C/ 104°F	45°C/ 113°F	50°C/ 122°F	55°C/ 131°F	60°C/ 140°F	65°C/ 149°F	70°C/ 158°F	75°C/ 167°F	80°C/ 176°F	85°C/ 185°F	90°C/ 194°F	95°C/ 203°F	100°C/ 212°F
H - 55D Shore	1	1	1	0.95	0.87	0.85	0.80	0.75	0.67	0.64	0.61	0.57	0.53	0.47	0.44
M - 53D Shore	1	1	0.92	0.83	0.75	0.72	0.65	0.60	0.56	0.54	0.52	0.47	0.42	0.38	0.35
DR-V1 - 53D Shore	1	1	0.89	0.81	0.77	0.71	0.67	0.62	0.61	0.57	0.54	0.51	0.51	0.47	0.45
MDD-M - 95A/46D Shore	1	1	1	0.98	0.95	0.90	0.87	0.80	0.70						
LT -95A/46D Shore	1	1	1	1	1	0.85	0.70	0.55							

Fa = Fmax * Kp * Kt

Fa = Allowable pull force at given temperature
Fmax = Maximum pull force allowed for the belt (use the Technical Data of each belt)
Kp = Factor from Table 8a - Pull Force Correction Factor (Teeth in Mesh)
Kt = Temperature correction factor

- Certain conditions may affect the life of the belt such as temperature, cooling cycle, load, product accumulation, and certain aggressive active ingredients in the product. At higher temperatures belt life may be less than if the belt was running under normal ambient temperatures.
- In higher temperatures the color of the belts can change, especially when combined with abrasive or chemically active products.
- The belt will elongate and contract far more significantly than at room temperature. How much depends on the temperature, maximum load, belt type and friction.
- A snub roller or some form of containment for the catenary sag that results should be considered. Especially if the belt is long, care should be taken on the return to cater for the additional length to avoid it touching conveyor parts or the factory floor when elongated.
- If removed for any reason, the belt should be replaced on the conveyor when cool, to ensure the engagement with the sprocket/s and snub do not result with additional tensioning when the belt cools down.
- Recommend UHMW (PE-1000) strips to reduce friction with the slide bed.

4. Verify that the Selected Belt can Carry the Calculated Pull Force

Compare the answer in step 2 to the Maximum Allowable Pull Force. If the Calculated Pull Force in Step 2, is less than or equal to Maximum Allowable Pull Force (Fa), then the selected belt is suitable for the application. You should continue with Step 5 to select the correct combination of Drive/Tail and Support Pulleys.
If the Calculated Pull Force in Step 2 is greater than maximum Allowable Pull Force in Step 3, you must change one of the following parameters:

- Increase the belt width.
- Change the Slide Bed to reduce the coefficient of friction. Volta recommends using UHMW (PE-1000) strips.
- Add a snub roller to increase the arc of contact (to increase the number of meshed teeth).
- Choose a larger diameter Pulley (to increase the number of meshed teeth).
- Reduce the load on the belt.

5. Start - Stop Applications

Such applications require a careful additional calculation of the pull force. Volta personnel should be consulted with full detail of the motor drive.

6. Determine the Number of Support Pulleys Required

For belts with one row of teeth add support pulleys in pairs.
Table 6a and Table 6b give the different pulley combinations based on the Pull Force. Locate the Calculated Pull Force from Step 1 in Table 6a and Table 6b. The row heading indicates the pulley combination you will need for the conveyor drive and tail shafts. Volta recommends using support pulleys for any belt 450mm/18": or wider regardless of the load weight.

Table 6a: Selection of Support Pulleys for Belts with One Row of Teeth

Belt type	Drive pulley only	Drive with 2 support pulleys	Drive with 4 support pulleys	Drive with 6 support pulleys
	20 cm / 8" width	40 cm / 16" width	60 cm / 24" width	80 cm / 32" width
SD-H-3mm	203 kg / 448 lb	343 kg / 756 lb	483 kg / 1065 lb	623 kg / 1374 lb
SD-H-4mm	261 kg / 574 lb	441 kg / 970 lb	621 kg / 1366 lb	801 kg / 1762 lb
SD-H-6mm	406 kg / 893 lb	686 kg / 1509 lb	956 kg / 2103 lb	1246 kg / 2741 lb
SD-M-3mm	138 kg / 304 lb	263 kg / 578 lb	388 kg / 854 lb	513 kg / 1130 lb
SD-M-4mm	176 kg / 387 lb	336 kg / 739 lb	496 kg / 1091 lb	656 kg / 1443 lb
SD-M-6mm	275 kg / 605 lb	525 kg / 1155 lb	775 kg / 1705 lb	1025 kg / 2255 lb
SD-LT-3mm	66 kg / 145 lb	126 kg / 277 lb	186 kg / 409 lb	246 kg / 541 lb
SD-Z-3mm	110 kg / 242 lb	210 kg / 462 lb	310 kg / 682 lb	410 kg / 902 lb
SD-Z-4mm	145 kg / 319 lb	277 kg / 609 lb	409 kg / 8998 lb	541 kg / 1190.20lb
SD-Z-6mm	220 kg / 484 lb	420 kg / 924 lb	620 kg / 1364 lb	820 kg / 1804 lb

Note: For the Mini SuperDrive™ belts add a Support Roller for every 75-100mm/ 3"-4" of belt width.

Table 6b: Selection of Support Pulleys for Belts with Two Rows of Teeth

Belt type	Pull force (PF) for 2 Drive pulleys	Pull Force (PF) for each additional Support pulley
SD-H-3mm	406 kg / 896 lb	70 kg / 154 lb
SD-H-4mm	522 kg / 1148 lb	90 kg / 198 lb
SD-H-6mm	812 kg / 1786 lb	140 kg / 308 lb
SD-M-3mm	276 kg / 608 lb	62 kg / 136 lb
SD-M-4mm	352 kg / 774 lb	80 kg / 176 lb
SD-M-6mm	550 kg / 1210 lb	125 kg / 275 lb
SD-LT-3mm	132 kg / 290 lb	30 kg / 66 lb
SD-Z-3mm	220 kg / 484 lb	50 kg / 110 lb
SD-Z-4mm	290 kg / 638 lb	66 kg / 145 lb
SD-Z-6mm	440 kg / 968 lb	100 kg / 220 lb

Note: For the Mini SuperDrive™ belts add a Support Roller for every 75-100mm/ 3"-4" of belt width.

For belts with two rows of teeth, determine the number of Support Pulleys as follows

6.1. If the Calculated Pull Force from Step 1 is less than the values shown in Table 6a or Table 6b for the Pull Force of a Standard Pulley (one for each row of teeth), you will need two Drive Pulleys without Support Pulleys. Nevertheless, Volta recommends using one Support Pulley mounted between the two Drive Pulleys.

- For a belt wider than 1200mm we recommend using at least 3 support pulleys regardless of load (one support between two rows of teeth and one on either end side of the teeth).

6.2. If the Calculated Pull Force in Step 1 is greater than the value shown in Table 6a or Table 6b.

6.2.1. Subtract the value in Table 6a or 6b from the calculated Pull Force (For example, for “M” material we subtract 276 kg / 608 lbs).

6.2.2. Divide the answer by 62 kg/136 lbs (for “M” material, Table 6a) and round up the given value. This gives the number of Support Pulleys needed to meet the Pull Force requirements.

For example, if the Pull Force is 320 kg/ 704 lbs. for a SD ‘M’ belt with two rows of teeth, then the number of support pulleys that you need is calculated as follows:

Metric Calculation	English Calculation
(320 - 276) /62 = 0.7 and round up to 1	(704 - 608) /136 = 0.7 and round up to 1

You will need one support pulley for each one of your conveyor drive and tail shafts.

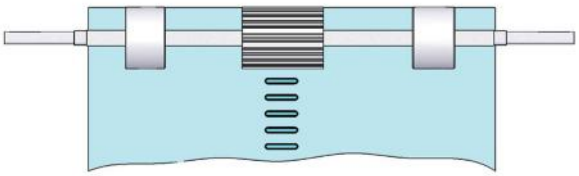
- After selecting the number of Support Pulleys required, add the lengths of all the Pulleys (Drive and Support or Tail and Support) together and make sure that the total length of the pulleys is not larger than the width of the belt.

Installation and Positioning of Support Pulleys

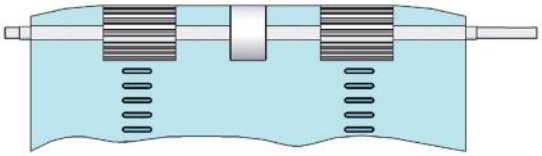
- Volta recommends using support pulleys for any belt 450mm/18" or wider regardless of the load.
- For belts with two rows of teeth, we recommend including at least one support pulley between the two drive pulleys.
- For a belt wider than 1200mm we recommend using at least 3 support pulleys regardless of the load (one support between two rows of teeth and one on either end side of the teeth).
- Support pulleys should be added according to the load to be carried on the belt and the belt width. The support pulleys should be positioned to remove any depressions in the belt surface.

The figures bellow show how to arrange the support pulleys in the correct position.

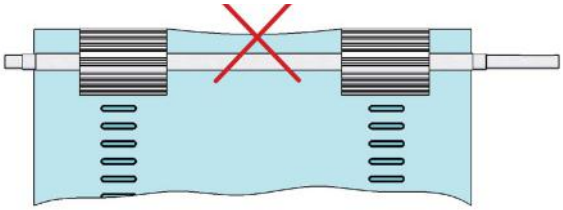
6.1



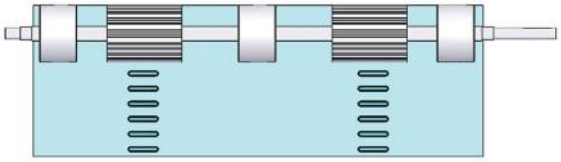
6.2b



6.2a



6.2d



6.2c

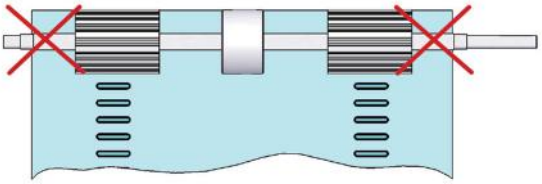


Figure 6.1 shows adding support pulleys for belt with one row of teeth. Add additional pulleys according to belt width.

Figure 6.2a shows a depression between the two drive pulleys. In this situation, install at least one support pulley between the two drive pulleys as shown in **Figure 6.2b.**

Figure 6.2c shows the belt with a support pulley between the drive pulleys but with the ends of the belt left unsupported.

Figure 6.2d shows the installation of support pulleys under each belt edge. The support pulleys should be positioned symmetrically.

Calculation Example

A Stainless Steel Slide Bed conveyor that elevates meat packages. Check if the 450 mm (18") FMB-3-SD belt is suitable for the application and choose the pulley set (drive, tail and support pulleys) and the pulley diameter.

Conveyor Conditions		
Package Weight	13.6 kg	30 lbs
Maximum number of packages on the belt	20	20
Conveyor Length (L)	15.2 m	50 ft.
Conveying Height (H)	3 m	9.84 ft.
Conveyor Horizontal Distance (X)	14.9 m	48.8 ft.
Weight of Return Rollers	4.5 kg	10 lbs
Number of Return Rollers	6	6
Pulley Diameter	152 mm	6"
Number of Teeth in Mesh	6	6
Accumulated Weight	0	0

1. Calculate the Maximum Pull Force

F=fs*(G1+G2)*X/L+fr*G2*X/L+fr*G3+C*G1*H/L+0.25*G4	
Metric	**English**
X=14.9	X=48.8
H=3	H=9.84
L=15.2	L=50
fs = 0.5 (stainless steel slidebed)	fs = 0.4 (stainless steel slidebed)
fr = 0.1	fr = 0.1
G1= 20*13.6=272 kg	G1= 20*30=600 lbs
G2= (3.6*0.45*15.2)+(0.180*15.2)=27.4 kg	G2=0.74*(18/12)*50+(0.121*50)=61.5 lbs
G3= 6*4.5=27 kg	G3= 6*10=60 lbs
G4= 0	G4= 0
F=0.5*(272+27.4)*14.9/15.2+0.1*27.4*14.9/15.2+0.1*27+1*272*3/15.2+0.25*0	F=0.5*(600+61.5)*48.8/50+0.1*61.5*48.8/50+0.1*60+1*600
F=205.8 kg	F=452.7 lbs

2. Calculate the Pull Force Per Unit Width of Belt

205.8/45 = 4.6 kg/cm or 452.7/18 = 25.15 lbs/inch.

3. Determine Allowable Pull Force and Pulley Diameter

Fa=Fmax * K

Fmax = 6.25 kg/cm (35 lb/in.) - see Maximum Pull Force in Technical Data on Page 8.

K = 1 (180° arc of contact at standard 150 mm/6 in. pulley)

4. Verify that the Selected Belts can Carry the Calculated Pull Force

The Pull Force per unit width of belt, 4.6 kg/cm (32.5 lbs/ft) is less than the allowable Pull Force for 6 or more teeth in mesh. Therefore you can use 150 mm (6") pulleys with 180o arc of contact.
If you require a 100 mm (4”) pulley for design reasons, calculate as follows:

Fa=6.25*0.6=3.75 kg/cm or Fa=35*0.6=21 lb/ink = 0.6 (k=06 for 4 teeth in mesh)

The allowable Pull Force 4.2 kg/cm (23.5 lb/inch.) is less than the application requirements 5.7 kg/cm (32.5 lb/inch). You must change one of the parameters listed in Step 4. For example, if you change the Slide Bed to UHMW strips, the coeffi- cient of friction will be 0.28 and therefore, the Calculated Pull Force from Step 1 will be 141.8 kg (312 lbs). The Pull Force per unit width of belt will be:

141.8/45 = 3.15 kg/cm or 312/18 = 17.33 lbs/inch.

This change brings the Pull Force per unit width below 3.75 kg/cm (21 lbs/ft). So you can use a 100 mm (4”) pulley.

5. Determine Support Pulley Requirements

The calculated pull force is 205.8 kg (452.7 lbs) and the Pull Force for a Standard Pulley without supports is 138 kg (304 lbs.) as shown in Table 6a. Therefore we must use the standard Drive Pulley with 2 Support Pulleys.

This arrangement can take up to 263 kg (578 lbs.) of Pull Force.

The length of the drive pulley and two support pulleys is shorter than the belt.

200 + 2 * 100 = 400mm	**8 + 2 * 4 = 16 inch**
And the belt is: 450 mm	18 inch

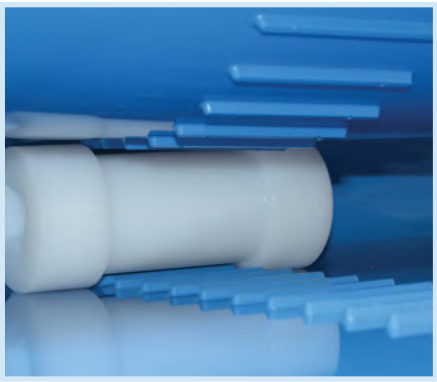
9. Motor Capacity Calculation

Calculation Procedure (for Constant Speed)

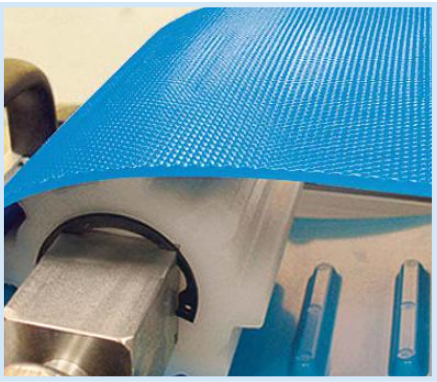
Metric	English
1. Calculation of the required torque for the drive pulley	
$M = \frac{F^* 9.81^* Dp}{1000 * 2}$	$M = \frac{F^* Dp}{12 * 2}$
M = torque [N* m]	**M =** *t*orque [lb.* ft.]
F = calculated Pull Force [kg] - see section 1, pg. 40	**F =** calculated Pull Force [lb.] - see section 1, pg. 40
Dp = pulley pitch diameter [mm] - see page 17	**Dp =** pulley pitch diameter [in.] - see page 17
2. Calculation of drive pulley revolution [rpm]	
$n = \frac{V^* 1000}{\pi * DP}$	$n = \frac{V^* 12}{\pi * DP}$
n = number of drive pulley revolution [rpm]	**n =** number of drive pulley revolution [rpm]
Dp = pulley pitch diameter [mm] - see page 17	**Dp =** pulley pitch diameter [in.] - see page17
V = belt speed [m/min]	**V =** belt speed [ft./min]
3. Calculation of the motor capacity	
$P = \frac{M^* n}{9550^* \eta} * k$	$P = \frac{M^* n}{5250^* \eta} * k$
P = power in [0.746 Kw=1 HP]	**P =** power in [HP] (1 HP = 0.746 Kw)
M = torque [N* m]	**M =** torque [lb* ft] (from step 1)
n = number of drive pulley revolution [rpm] (from step 2)	**n =** number of drive pulley revolution [rpm] (from step 2)
η = efficiency of the drive transmission equipment (η < 1)	**η =** efficiency of the drive transmission equipment (η < 1)
It depends on the drive type and motor data provided by the manufacturer. In most cases it may vary from 0.6 to 0.85.	
k = correction/ safety coefficient (K > 1)	**k =** correction/ safety coefficient (K > 1)
Take into account working conditions according to the motor and drive gear data provided by the manufacturer.	
4. Choose a motor: the next size up	

Notes

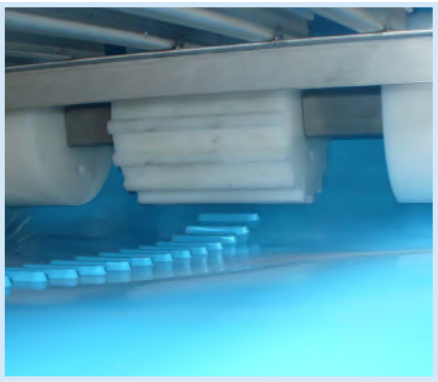
SuperDrive™ & Mini SuperDrive™ Belts



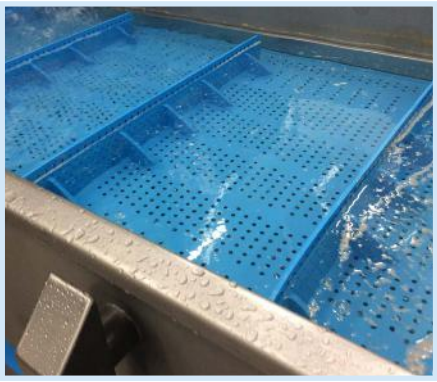
Mini SD™ Tail Pulley



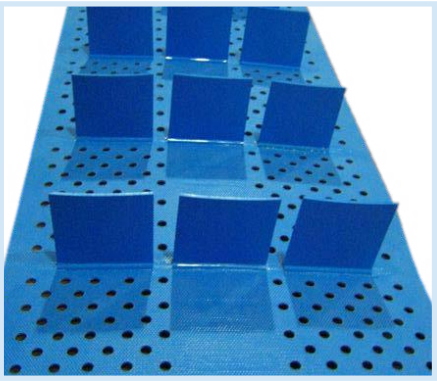
SD™ Drive Pulley



SD™ Drive & Support Pulley



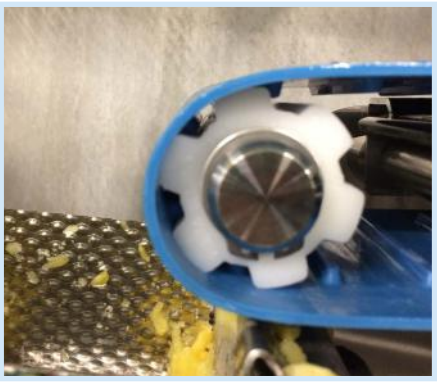
SuperDrive™ Working Under Water



Perforated SD™ Belt With Flights

Conveyor construction with Mini SD™

SD™- LT Low Temperature



Mini SD™ belt

Trough Conveyor

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