

CONVEYOR & ELEVATOR BELTS FOR UNDERGROUND APPLICATION

TEXTILE CARCASS

DELTAFLAM GT
Multiply with rubber covers

GI / FIREWALL
Multiply with rubber covers

FIRESHIELD
Straight-warp with rubber covers

DX FLEXAMID
Aramid straight-warp
with rubber covers

FIREMASTER / PVG
Solid-woven with rubber covers

PVC
Solid-woven with PVC covers

STEEL CARCASS

FIREMASTER ST
Steel cord with rubber covers

CONVEYOR AND ELEVATOR BELTS FOR ABOVEGROUND APPLICATION





The conveyor belts described in this brochure are to be used for conveying material in underground mines or tunneling applications. A risk analysis should be done by the user in order to assess the extent of the following hazards:

- Limited means of escape
- Potentially flammable environment
- Presence of flammable dust or transport of flammable material
- Presence of additional fuel combustion elements such as wood, plastics, etc.

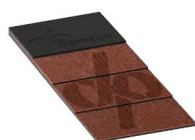
Our underground belts applications are suitable for several safety standards as:

- EN14793 in Europe,
- MSHA Part 14 standards in USA,
- VVUU in Czech Republic, Ukraina,
- etc...

Belt construction

Conveyor and elevator belts are composed of:

- **fabric or steel carcass**
- **two rubber or PVC covers** : a top cover ensuring contact with the transported material and the bottom cover ensuring contact with the carrier rollers.



MULTIPLY

(see details p4)

DELTAFLAM GT
GI
FIREWALL MSHA



**POLYESTER
STRAIGHT-WARP**

(see details p5)

FIRESHIELD



**ARAMID
STRAIGHT-WARP**

(see details p6)

DX FLEXAMID
EN14973 A/B2



SOLID WOVEN

(see details p7)

PVC
FIREMASTER / PVG



STEEL CORD

(see details p8)

FIREMASTER ST

The European standard EN 14973 defines different safety classes for the following belts to be used for the application following the risk assessment process performed by the user:

- A: for limited access and means of escape,
- B1 / B2: for potentially flammable atmosphere,
- C1 / C2: for combustible dust or combustible material conveyed + additional fuel sources, ex: fire load)

Type of belt	Safety class	Temperature range	Composition	Abrasive index (mm ³)	Break resistance (Mpa)	Elongation at break (%)	Slope / inclination (approximate)
FIREWALL (MSHA)		0°C to 50°C	CR	<120	>18	>400	20° to 22°
FIREWALL II (MSHA)			NBR	<180	>14	>380	
GI / DELTAFLAM GT / DX-FLEXAMID*	A or B2	-20°C to +80°C	SBR	<180	>15	>350	
	C1		CR	<120	>18	>400	
	C2			<160	>17	>400	
FIREMASTER ST	A ou B2	-20°C to +80°C	SBR	<180	>15	>350	
	C2		NR-SBR	<200	>15	>350	
FIREMASTER / PVG (CR)	C1 (a)	0°C to +50°C	CR	<120	>18	>400	16° to 20°
	C2			<160	>17	>400	
FIREMASTER / PVG (NI)	C1 (b)		NBR	<180	>14	>380	
	C2			<180	>14	>380	
PVC	C1		PVC	<200	>12,5	>300	13°



Multiply belts with rubber DELTAFLAM GT - GI - FIREWALL

These belts are used for the transportation of bulk or other material in various underground mining and quarrying applications, or any applications required to be fire resistance according to MSHA Part 14 or EN14793.

Belt structure

The belt with multiply textile carcass is made up of layers of fabric, from 2 to 4 (or more) plies. Each of these is separated by a rubber layer. This «sandwich» structure enables the belt to absorb shocks. The upper and lower fabrics of the belt are then covered with a final rubber cover.

Applications :

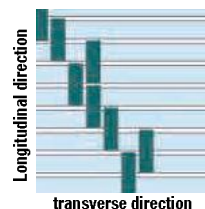
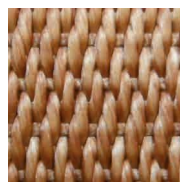
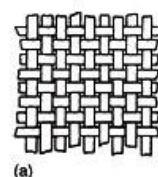


Different cover properties:
refer to the table on page 3.

Thickness and weight of the belts:
according to technical sheets on request.

Minimum diameter of use of the drums:
see details on page 10

Joining procedures:
available on request.

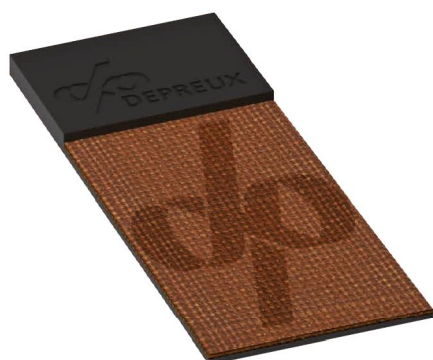


The fabric of each ply is made either by a weaving fabric called «1/1» band - DELTA (crossing a warp yard and a weft yarn) or a weaving fabric called «Jacquard» - DELTA CFW belt - (CFW or Crows Foot Weave) with warp and weft yarns bigger, which provides greater resistance to impact and to longitudinal tearing.

- At 10% of belt nominal tensile strength: 1.5% max. Permanent stretch: around 0.7% and elastic stretch: around 0.5% for standard carcass.

- The fabrics are dipped with RFL solution. The RFL and rubber composition is designed to ensure maximum adhesion between the plies. This needs to be adhesive high enough to ensure a long-life expectancy, but not so adhesive that it would hamper the operation of splicing the belt.

Adhesion: > 4N/mm.



Textile Straight-warp belt FIRESHIELD (DX FLEX MHSA)

Belt structure

The Fireshield belt has excellent properties of resistance to tearing and resistance to heavy impacts.

Thanks to a thin carcass, Fireshield can also be used with smaller pulley diameters than textile ply or steel-cord belts. Ability of Fireshield is much better than a ply conveyor belt.

Fireshield is therefore used on heavy duty conveyors where resistance to the effects of heavy impacts and resistance to tearing are important characteristics, typically seen in quarrying, open cast mining and steel industries... or in applications where heavy-duty and yet narrow belts are required, such as in tunneling.

Applications :



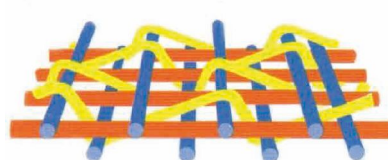
Different cover properties:
refer to the table on page 3.

Thickness and weight of the belts:
according to technical sheets on request.

Minimum diameter of use of the drums:
see details on page 10

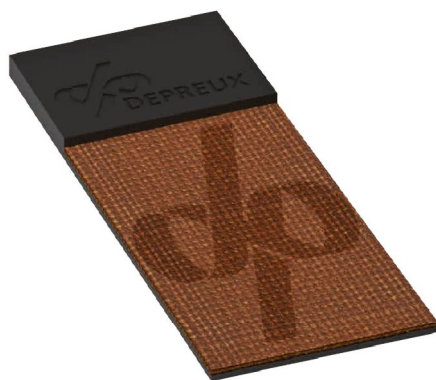
Joining procedures:
available on request.

Fireshield is a textile belt straight-warp with a carcass composed of one or two plies. Each ply is with straight-warp, protected on both top and bottom by weft lines in textile as shown in the opposite drawing.



The straight-warp is composed of thick twisted (textile cables) in polyester. This warp is inserted between two textile weft made of thick twisted polyamide. The warp and the weft are connected by a small fine wire which ensures the maintenance of textile.

For high resistance, it is better to use 2 plies straight-warp, separated by an interply in rubber to facilitate splicing.



Aramid straight-warp belt DX-FLEXAMID EN14793 A / B2

This belt is the lightest and thinnest of all the textile and steel casing options in the Depreux range. Aramid yarn has a specific strength (or toughness) 3 times higher than a polyester yarn.

It is naturally lighter than steel and its lengthening comparable. The aramid yarn is used in the warp and the polyamide yarns are generally used in the weft.

This belt is suitable for safety standard defined in the European norm EN14793, category A to B2.

Applications :



Belt structure

DX-FLEXAMID belt is composed of a straight-warp carcass, made of a layer of aramid straight chain fibre yarn, with two layers in the weft direction, upper and lower polyamide textile fibre yarn.

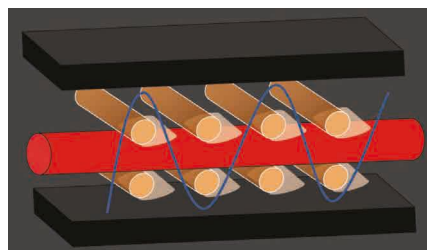
The yarn of the warp and weft are connected with a bonding polyamide yarn to ensure a strong construction.

Different cover properties:
refer to the table on page 3.

Thickness and weight of the belts:
according to technical sheets on request.

Minimum diameter of use of the drums:
see details on page 10

Joining procedures:
available on request.





Applications :



Different cover properties:
refer to the table on page 3.

Thickness and weight of the belts:
according to technical sheets on request.

Minimum diameter of use of the drums:
see details on page 10

Joining procedures:
available on request.

Solid-woven belts with rubber or PVC covers PVG/FIREMASTER - PVC

Firemaster-PVG belts are used when a long service life is expected. It is for use in applications which are characterized by severe operating conditions such as high speed systems, presence of large material, risk of impact damage, longitudinal tearing, or edge wear.

Firemaster-PVG belts are also used for long distances and/or when the system faces a steep slope. This belt will be better for these applications than a standard ply or steel cord belt because of its high mechanical and corrosion resistance, the lower power requirement, the ease of installation and maintenance and its superior mechanical fastener holding.

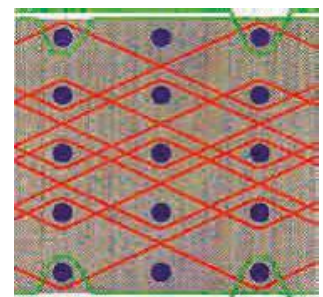
Condition of use: from 0°C to 50°C. The belt is insensitive to moisture and rot-proof.

A major advantage over ply belts is that Firemaster-PVG belts need smaller drum diameters. The advantage over steel-cord belts is that Firemaster-PVG belts usually need less power to function.

Belt structure

The solid-woven textile is made of polyester (E) yarns in the warp direction to minimize the stretching of the belt, and of polyamide (P) yarn in the weft direction for good belt flexibility.

- At 10% of nominal belt tensile strength: 1 % maximum
- Elastic stretch: 0.5% to 0.7% for standard carcass
- Permanent stretch : 0.4% to 0.7%.
- Excellent fastener holding capacity - from 50% to 90% - which makes this joining technique increasingly popular.



The solid-woven carcass is covered with cotton ply yarns laid in the warp direction, and special edge reinforcements which make the belt exceptionally resistant:

- to impacts by sharp or large materials,
- to longitudinal tearing,
- to carcass wear in case of substantial damage in the rubber cover.

As the carcass is highly compact, the thickness of the outer rubber covers can be reduced.



Applications :



Different cover properties:
refer to the table on page 3.

Thickness and weight of the belts:
according to technical sheets on request.

Minimum diameter of use of the drums:
see details on page 10

Joining procedures:
available on request.

Steel cord belt with rubber covers FIREMASTER ST

Steel cord belts are used in a wide variety of applications such as mining, harbour terminals, tunneling, steel works, cement plants and power generation plants.

Steel cord belts are preferred to textile plied or solid-woven conveyor belts in the following situations:

- when the required tensile strength is high and the conveyor tight. The feeding capacities are interesting for small width belts.
- when a very low elongation of the belt is necessary, especially for very long open-cast conveyors, such as those connecting a quarry and a cement plant, steel mills or tunneling.

Belt construction

A Firemaster-ST conveyor belt is composed of:

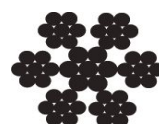
- steel cables placed at a constant pitch across the width of the belt,
- a special rubber-bonding layer to the cables and to the rubber covers,
- top and bottom rubber covers.

Steel cord construction

DEPREUX uses the open type steel cord construction that allows the rubber to penetrate fully into the cable, which is a guarantee of the longevity for the belt. This technique optimises the adhesion and minimises corrosion to the steel cords in the case of damage to the belt.

Open steel cables also offer characteristics that enhance the impact absorption capability of the belt and makes for easy transition between the troughed position of the belt to flat and vice versa.

The steel cables are also protected against corrosion with special zinc plating.



Steel breaker ply technical parameters

Break resistance (N/ mm)	HE 125	HE 250	HE 315	HE 400
Weight (kg/mm)	0.7	1.20	1.45	2.50
Cable diameter (mm)	1.35	1.52	1.52	2.40
Pitch (mm)	8.9	6.4	5.1	7.1
Density (cable/m)	112	156	196	141



Technical parameters

Construction according to ISO 15236-2

Type	Unit	ST 500	ST 630	ST 800	ST 1000	ST 1250	ST 1400	ST 1600	ST 1800	ST 2000	ST 2250	ST 2500	ST 2800	ST 3150	ST 3500	ST 4000	ST 4500	ST 5000	ST 5400
Tensile strength	N/mm	500	630	800	1000	1250	1400	1600	1800	2000	2250	2500	2800	3150	3500	4000	4500	5000	5400
Max. steel cord diameter	mm	3,0	3,0	3,7	4,2	4,9	5,0	5,6	5,6	5,6	5,6	7,2	7,2	8,1	8,6	8,9	9,7	10,9	11,3
Min cord tensile strength	KN	7,6	7,6	10,3	12,9	18,4	20,6	26,2	25,5	25,5	26,2	39,7	39,7	50,0	55,5	63,5	75,0	90,3	96,0
Space between cords (±1,5mm)	mm	14,0	11,0	12,0	12,0	14,0	14,0	15,0	13,5	12,0	11,0	15,0	13,5	15,0	15,0	15,0	16,0	17,0	17,0
Min thickness cover	mm	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	5,0	5,0	5,5	6,0	6,5	7,0	7,5	8,0
Belt width	tolerance (mm)	Cord numbers																	
600	+10/-5	33	42	39	39	34	34	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
650	+10/-7	44	54	51	51	45	45	41	46	52	56	41	46	41	41	41	39	36	N/A
800	+10/-8	54	68	64	63	55	55	60	57	64	69	51	57	51	51	51	48	45	45
1000	±10	68	84	80	80	68	68	63	71	80	86	63	71	63	64	63	60	56	57
1200	±10	86	110	97	97	82	82	76	85	96	104	76	85	76	76	76	72	67	68
1400	±12	96	124	114	113	97	97	90	100	112	122	89	99	89	89	89	84	79	79
1600	±12	111	142	130	130	111	111	103	114	129	140	102	114	102	102	102	96	90	90
1800	±14	125	160	147	147	125	125	116	129	145	159	116	128	116	116	116	108	102	102
2000	±14	139	177	164	163	140	139	130	144	162	177	129	143	129	129	129	121	114	114
2200	±15	153	195	180	180	154	154	143	159	179	195	142	158	142	142	142	133	126	126
2400	±15	167	213	197	197	168	168	156	174	195	213	156	173	156	156	156	146	137	137
2600	±15	181	231	214	213	182	182	170	189	212	231	169	188	169	169	169	158	149	149
2800	±15	196	249	230	230	197	197	183	203	229	249	182	202	182	182	182	171	161	161
3000	±15	210	267	247	247	211	211	196	218	245	268	196	217	196	196	196	183	173	173
3200	±15	224	286	264	263	225	225	210	233	262	286	209	232	209	209	209	196	184	184

N/A: Not applicable because of troughability

RECOMMENDED MINIMUM PULLEY DIAMETRES (MM)

DELTAFLAM GT - GI - FIREWALL

Break resistance N/mm	630		800		1000		1250		1400	1400	1600	1800	2000	2500
Number of plies	2 to 3	4 to 5	2 to 3	4 to 5	2 to 3	4 to 5	2 to 3	4 to 5	3	4 or 5	3 to 5	4 or 5	4 or 5	5
Pulley type A	500	630	800	1000	630	1000	800	1000	800	1000	1250	1000	1000	1250
Pulley type B	400	500	630	800	500	800	630	800	630	800	1000	800	800	1000

FIRESHIELD

Break resistance N/mm	400		500	630	800	800	1000	1000	1250	1600	1800
Number of plies	1		1	1	1	2	1	2	2	2	2
Pulley type A	315		315	315	500	630	630	800	800	1000	1000
Pulley type B	250		250	250	400	500	500	630	630	800	800

DX-FLEXAMID EN14973

Break resistance N/mm	1600		1800		2000		2500		3150	
Pulley type A	800		1000		1000		1250		1250	
Pulley type B	630		800		800		1000		1000	

FIREMASTER PVG - PVC

Break resistance N/mm	400	500	630	800	1000	1250	1400	1600	1800	2000	2500
Number of plies	1	1	1	1	1	1	1	1	1	1	1
Pulley type A	400	400	500	500	630	800	800	800	1000	1000	1250
Pulley type B	315	315	400	400	500	630	630	630	800	800	1000

FIREMASTER ST

Break resistance N/mm	ST630	ST800	ST1000	ST1250	ST1600	ST2000	ST2500	ST3150	ST3500	ST4000	ST4500	ST5000	ST5400	ST6300
Number of plies	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pulley type A	500	500	630	800	1000	1250	1400	1500	1600	1600	1600	1800	1800	1800
Pulley type B	400	400	500	630	800	1000	1000	1250	1250	1250	1250	1400	1400	1400



CONVEYOR BELT MANUFACTURER

Cobra has an international sales team and three production sites (in France, Poland and China).

With the three brands Depreux, Transco and Indi as well as the corresponding accessories and services, Cobra offers complete solutions for your requirements.

Our decades of experience is based on:

- a controlled manufacturing process,
- the traceability of raw materials,
- compliance with safety standards,
- cooperation with universities and institutes,
- Highly qualified staff.

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