



Safety belts
for underground mines



Solid-woven PVC
Solid-woven PVNI
Solid-woven chloroprene PVG
Plied belts GI

DEPREUX - A world leader in the field

of fire-retardant safety belts for use in underground mines

This brochure describes the conveyor belt range for underground mining applications which have to satisfy the British, Australian, South-African, Spanish, Canadian, Indian, Chinese and other national specifications. In all these countries, the basic requirements for fire-resistance and other safety features are very severe. As safety underground can not be compromised, we at DEPREUX have the answer to your needs.

DEPREUX has been producing safety belts for fire-retardant abrasive resistant installations for underground mining in excess of 50 years now, and is today one of the worlds technological leaders in this field.

DEPREUX belts are used extensively in underground mines in Germany, France, Poland, UK, Spain, USA, Australia, China, South Africa, India, Turkey, Ukraine, to name but a few.

The belts used in underground mines must comply with the different national and international safety norms and standards (antistatic, flame-resistance, drum friction, etc.) of the country in which the belts are to be installed.

DEPREUX belts, in addition to the stringent safety standards, also have to meet mechanical standards to comply with different client specifications, these requirements can be many and varied and to meet clients specific requirements DEPREUX can design conveyor belts with higher fastener holding, increased cover to carcase adhesion, special cover compounds or whatever the demands of the conveyor belts intended use might be. For your special needs please contact the DEPREUX technical department.

As the various safety or mechanical international standards are very different to one another, we at DEPREUX have adapted our wide range of technology to meet the individual market requirements.



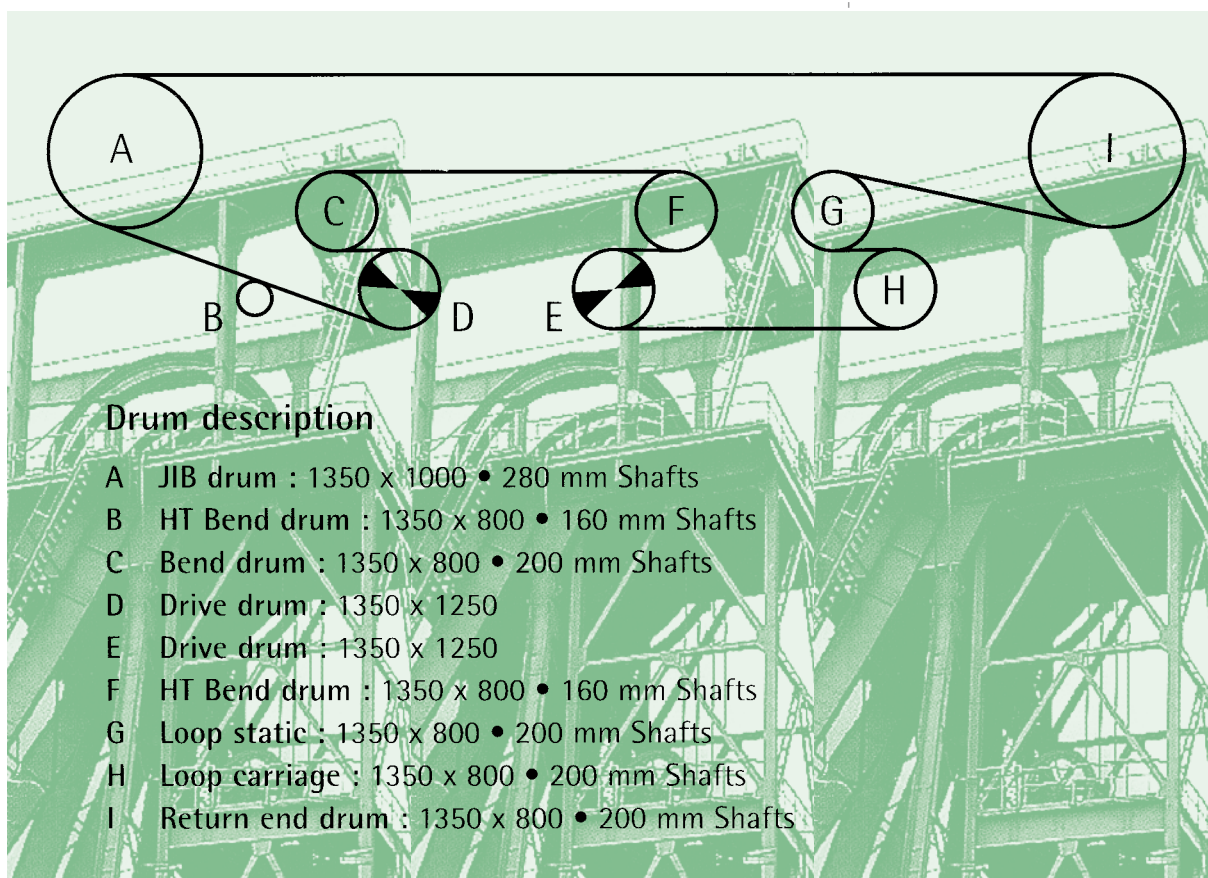
DEPREUX - A specialist manufacturer

of high tensile strength textile belts



DEPREUX is one of the worlds most experienced manufacturers of high tensile textile belts (2000 to 3150 N/mm) used underground.

Our belts have been used for many years by some of the most exacting clients in the world, such as the one described below.



Safety belts - Safety properties

All DEPREUX belts have undergone the most stringent fire and anti-static testing to obtain the necessary certification and clients approvals.

Propane burner test



This test is designed to simulate the conditions of a fire in an underground gallery with ventilation. A sample of belt to be tested is placed on a supporting frame directly above a propane burner, the burner is ignited for a designated period of time consuming a specific quantity of propane. The fire source is then removed and the belt must self-extinguish leaving an area of the belt totally undamaged. This test is a demonstration that the belt will not support combustion when the source of the flame is removed.

Each country has adopted its own method of testing based on the above basic description. DEPREUX are familiar with all the worlds leading standards and fully comply with the UK, Australian, French, German, Indian, USA, Canadian, Chinese, RSA testing criteria along with many other of the world's testing authorities.

Drum friction test



This test was developed to simulate a stalled belt where the drum continues to rotate against the sample belt and is to prove the propagation of fire will not result from the drum's generated frictional heat igniting it. As an example, in the U.K. test, the drum temperature must not exceed 325°C before the belt sample breaks on the drum, in addition there must be no flame or glow at any time during the test or when the test is completed.

Similar to the propane burner test the countries mentioned above have adopted slightly different variations of the test, concerning the running time and drum temperatures.

The other main criteria is that the frictional heat generated must not be in excess of that required to ignite coal dust and thereby cause a fire or explosion.

Flame test



Small samples of the finished belts are prepared, some are left intact and on others the covers are removed to simulate wear on the belts. These samples are held in a flame source for a certain period of time and once removed the samples must self extinguish. The time for the individual sample to extinguish is noted along with the collective time to conform to specification.

Mechanical properties

In addition to comply to the safety standard the mechanical properties of the DEPREUX belts are designed to achieve the maximum operating life and optimum installation cost.

Maximum life expectancy

Life expectancy is extended with our strongly woven carcasses in the warp and weft direction protected by an interwoven cotton surface impregnated with specially formulated PVC to achieve high adhesion between cover and carcass. DEPREUX have specially formulated covers to provide our clients with high impact, cut and abrasion resistance.

Minimum operation and installation costs

DEPREUX belts are made to have optimum elongation and troughability to ease the belt installation and start-up.

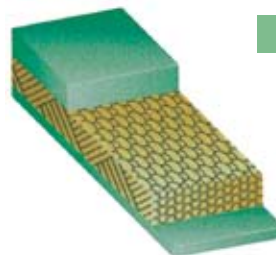
Extensive tests, both static and dynamic, have been undertaken to ensure a minimum 50% to 90%, for a mechanical fastener, or 60% to 90% for a vulcanised joint, of the specified belt tensile strength.

DEPREUX belt constructions

In order to satisfy the different clients requirements five textile belt constructions are offered :

Solid-woven (PVC)

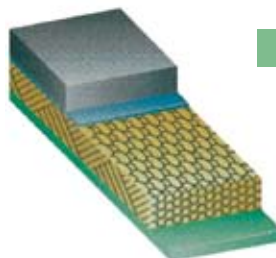
Composed of PVC impregnated solid-woven carcass with PVC covers



PVC

Solid-woven nitrile and PVC (PVCNI)

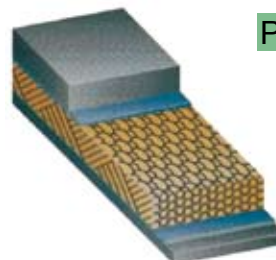
Composed of a PVC impregnated solid-woven carcass with a nitrile cover on the carrying side and a PVC cover on the underside



PVCNI

Solid-woven nitrile (PVNI)

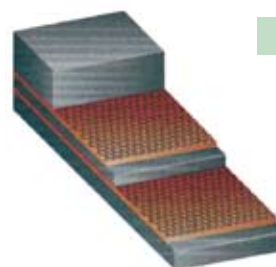
Composed of PVC impregnated solid-woven carcass with nitrile covers both sides



PVNI-PVG

Solid-woven chloroprene (PVG)

Composed of PVC impregnated solid-woven carcass protected with chloroprene rubber covers both sides



GI

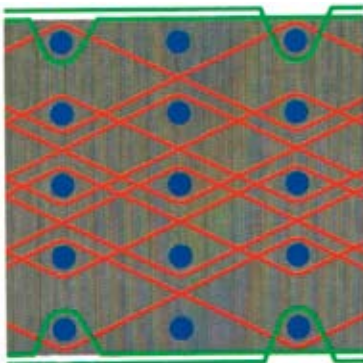
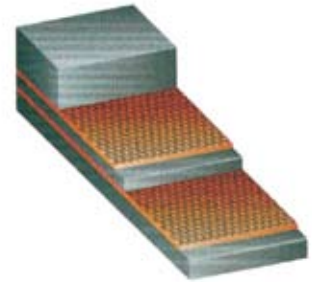
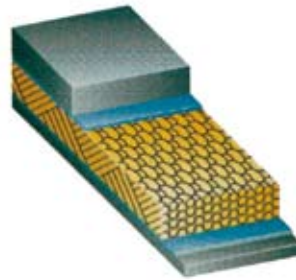
Plied belts (GI)

Composed of several plies of EP fabrics separated by fire-resistant rubber interlayer and covered with fire-resistant chloroprene rubber covers

The belt carcass

Solid-woven range

GI range



The different belts all have a PVC impregnated solid-woven textile carcass, which follows a complex pattern.

The carcass is made of a textile fabric which is designed to the requirements regarding belt elongation, flexibility for troughing, fastener holding retention and resistance to impact and edge damage.

The warp in the fabric is either in polyester (for a low elongation belt), or in polyamide (for special impact resistance). The weft is mainly polyamide to ensure troughing flexibility. Cotton ply warp yarn is added on top and bottom of the fabric to protect the carcass against impact and potential cuts or damage.

This textile fabric is then impregnated with PVC paste, which makes it compact, fire resistant and totally impervious to moisture or other degradation, while retaining its mechanical properties.

In DEPREUX's impregnation process the PVC impregnated rate is controlled, and the carcass is stretched in the machine. This feature allows the belt to have optimum flexibility and low elongation.

The GI belt is composed of several fabrics separated by flame-resistant rubber.

The warp in the fabric is generally in polyester to achieve low elongation, and the weft is in polyamide to ensure good troughing, flexibility and impact resistance.

Standard range

The standard range is 400 N/mm to 2500 N/mm with a maximum of 5 plies.

Alternative belts may of course be proposed, as for example, with polyamide in the warp or stronger weft construction and with stronger fastener holding properties, or made to match particular clients specification.



International designation	"British" designation	Warp strength (N/mm), min.	Weft strength (N/mm), min.	Nominal carcass thickness (mm), min.	Nominal carcass specific weight (kg/m ²), min.
400/1	400/1 • (type 2)	400	160	3,0	4,0
500/1	580/1 • (type 3)	580	245	5,8	6,5
630/1	710/1 • (type 4)	710	265	6,2	7,0
800/1	875/1 • (type 5)	875	320	7,0	8,0
1000/1	1140/1 • (type 6)	1140	350	7,5	9,5
1250/1	1250/1 • (type 7)	1250	350	8,0	10,0
1400/1	1400/1 • (type 8)	1400	350	8,7	11,0
1600/1	1600/1 • (type 9)	1600	450	9,0	11,2
1800/1	1750/1 • (type 10)	1750	450	9,5	11,5
2000/1	2100/1 • (type 12)	2100	450	10,5	12,5
2500/1	2625/1 • (type 15)	2625	450	12,5	14,5
3150/1	3150/1 • (type 18)	3150	450	15,5	17,0

DEPREUX range

The properties of the covers are given in the following table :

	PVC	Nitrile (PVNI and PVCNI)	Chloroprene (GI and PVG)
Slope / inclination (approximate)	13°	16° to 20°	20° to 22°
Cover thickness (theoretical maximum)	4 mm per side	6/8 mm per side in case of rubber 4 mm in case of PVC	6/8 mm per side
Specific weight of cover	1,40 kg/m ³	1,35 kg/m ³	1,45 kg/m ³

Belt covers

The belts are designated by DEPREUX as follows :

Example : **PVC 1400/1 - 1200 - 2 + 2 - BS**

PVC	belt with PVC on both faces
1400	nominal tensile strength
1	one ply
1200	width 1200 mm
2 + 2	upper and lower cover thickness
BS	BS standard for underground

Belt designation

Belt design and maintenance



For design purposes summarised in the following table are our recommendations concerning the minimum drum diameters. For optimum DEPREUX conveyor belt joint performance please refer to our technical department for recommendations.

International designation	UK designation	Minimum recommended drum diameters (mm)	
		High tension	Low tension or snub
400/1	400/1 (type 2)	315	250
500/1	580/1 (type 3)	315	250
630/1	700/1 (type 4)	400	355
800/1	875/1 (type 5)	500	355
1000/1	1140/1 (type 6)	630	400
1250/1	1250/1 (type 7)	750	450
1400/1	1400/1 (type 8)	750	450
1600/1	1600/1 (type 9)	800	600
1800/1	1750/1 (type 10)	800	600
2000/1	2100/1 (type 12)	1000	750
2500/1	2625/1 (type 15)	1200	800
3150/1	3150/1 (type 18)	1500	1000

DEPREUX's recommendations for conveyor design as well as belt installation, jointing, maintenance and accessories selection are detailed in a document that is available upon request.

Assistance in conveyor system design

DEPREUX's engineers are at your service to assist you with propriety software to optimise the design of the conveyor belt as well as the conveyor systems main components, and to advise you on the most suitable method to install, joint and operate the belt.



Belt Reeling

Different reeling possibilities are offered to maximise the roll length to reduce the number of belt joints on a conveyor. A special machine has been designed to roll up belts in a variety of ways to meet dimension constraints which often occur in the underground mining conditions.

Coiling alternatives :

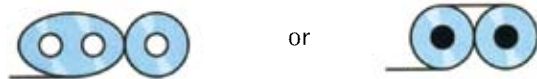
Type 1 : single coil rolls



Type 2 : cassette coiled rolls with belt ends internal



Type 3 : cassette coiled rolls with one belt end on the outer lap



Type 4 : cassette coiled rolls with both belt ends on the outer laps



Type 5 : single belt lengths rolled to form four coils



Type 6 : single belt lengths rolled oval



○ standard core

● special core



Experience gained by working with exacting international clients has enabled DEPREUX to establish a rigorous quality control system.

Our total systems are certified to ISO 9002. The DEPREUX factory is equipped with the most modern laboratory and control facilities enabling us to produce a record of the extensive quality checks on the belts we manufacture for you. These records are available to all our customers on request.

**DEPREUX –
guaranteed
quality control**



This brochure describes the safety belts that can be used underground according to specific norms, but DEPREUX also produces other types of conveyor belts:

- 1) **fire resistant belts** for use in underground mines, in compliance with other norms and standards
- 2) **other belts** for use in various **industrial sectors, quarries and opencast mines** :
 - DELTATHERM for the transport of hot materials
 - DELTAFAT and DYNAFAT for the transport of oily and greasy materials
 - DELTAFLAM and DYNAFLAM for fire-resistant applications
 - belts for use with bucket elevators
 - belts for various other special applications
- 3) **belts** used for transporting of **food products** :
 - FIGUM : rubber
 - FIPLAST: PVC

COBRA EUROPE

12 rue Henry Guy
70303 LUXEUIL LES BAINS
France

Tel.+33 3 84 93 89 30

Fax +33 3 84 40 44 92

www.cobra-cs.com

