FENNER DUNLOP
CONVEYOR BELTING

Fire resistant belting

Guide to fire-retardant conveyor belts for general above-ground use

If a belt does not perform according to the manufacturer's claims by wearing prematurely or ripping too easily, for example, the risk to life is relatively small. However, if a conveyor belt specified as fire-retardant catches fire and does not resist the flames as intended, the consequences can be catastrophic.

No conveyor belt is fireproof

The most important point to remember is that conveyor belts cannot be completely fireproof. The rubber used for the covers and the rubber skim between the fabric plies can be engineered to resist fire, but the complete belt structure cannot be made entirely fireproof.

When choosing a fire-retardant conveyor belt, determining the appropriate level of fire resistance required for a specific application or operating environment is crucial.

Environments with flammable dust and gas

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Above-ground and general service applications

Because fire safety is such an important issue, there are numerous safety classifications and international standards, supported by a wide range of tests used to measure the self-extinguishing properties of conveyor belts.

The basis of most tests for belting used in standard industrial applications is EN ISO 340. This standard distinguishes between fire resistance with covers, classified as K, and fire resistance with or without covers, classified as S.

No conveyor belt is fire proof

The relevance of "with or without covers" is that wear gradually reduces the amount of fire-resistant rubber protecting the flammable carcass.

The best way to choose between K and S grades is to consider the material being transported. For moderately abrasive materials, such as grain, K grade is usually adequate.

However, if the material is abrasive and tends to wear the top cover rapidly, or if the belt is carrying biomass that can self-combust, the safest option is to select S grade, classified as Class 2B.

In both K and S grades, the rubber skim bonding the fabric layers of the carcass together must also be fire-resistant. In the case of S grade, which is fire-resistant without covers, the rubber skim should be thicker than the skim used for K grade.

Fire- and wear-resistant

The ingredients used to create a fire-resistant rubber compound generally have an adverse effect on its wear-resistant properties. As the thickness of the rubber decreases, so does the level of protection.

At Fenner Dunlop, our rubber compound technicians have developed fire-resistant compounds that are also extremely resistant to abrasion. Buyers should always request a technical datasheet showing the abrasion level and should demand an average of less than 150 mm^3.

EN ISO 340 testing

EN ISO 340 testing involves exposing six individual belt samples to a naked flame, causing them to burn. The flame source is then removed, and a current of air is applied to each test piece for a specified period.

The time taken for each belt sample to self-extinguish after the flame has been removed is then measured. The duration of continued burning, indicated by a visible flame, should be less than 15 seconds for each sample, with a maximum cumulative duration of 45 seconds for each group of six test samples.

This test helps determine how fire may be carried along a moving belt. Even if a manufacturer states that its fire-resistant belt has passed the ISO 340 test, buyers should still exercise caution. A typical conveyor belt can spread fire over a distance of more than 40 metres within 15 seconds.

For this reason, Fenner Dunlop's required time-limit standard is no more than one second and ideally zero seconds. Buyers of fire-resistant belts are advised to request copies of the test results and verify that the laboratory carrying out the tests complies with EN ISO 17025, Chapter 5.

What standard of fire resistance do I need?

For the vast majority of conveyor belts used in open-air applications, Class 2A or Class 2B is perfectly adequate.

Class 2A requires the belt to pass the ISO 340 test with the covers intact on the belt samples, known as K grade.

Class 2B requires the belt to pass the ISO 340 test with both the top and bottom cover rubber removed, known as S grade.

The electrical conductivity of the belt must also meet the requirements of ISO 284.

Fire test at Dunlop lab.

Don't play with fire

Although manufacturers and suppliers provide test certificates, in some cases the certificate may relate only to the belting produced specifically for certification testing. The actual belt delivered to the site may not meet the required standard.

For greater peace of mind, we recommend ordering an additional metre of belt for independent testing by an accredited testing authority or laboratory.

Seek advice

More often than not, the quality of a belt, including its ability to resist wear, is reflected in its price. It is always worth carefully checking the original manufacturer's specifications and requesting documented evidence of tested performance against the relevant international standards before placing an order.

Learn more about Fenner Dunlop Conveyor Belting

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