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ATEX Belts

esbelt
Conveyor Belts

ATEX

Risk of Explosions in Cereal Silos

Introduction

Suspended combustible particles spread by the air at a given concentration can produce an explosion if a source of heat is present.

How an Explosion is Produced

For an explosion of dust to occur, three main factors are required:

1. Dust of a given size and concentration.
2. The burning agent is the air, which, as it contains oxygen, produces the combustion process.
3. An ignition point or heat source (sparks from friction in machinery, electrical equipment, hot surfaces, flames and so on).

Through the interaction of these three factors, an initial explosion can occur which produces a small fire or explosion; the rest of the dust present in the facility is blown by the air and when it mixes with the initial fire it produces a further (secondary) explosion which in turn leads to additional expansive waves, stirring up dust in other areas and producing further explosions, i.e. a chain reaction of explosions.

Where Explosions Usually Occur

Elevator belts fitted with buckets work at high speed for many hours a day, thus reproducing an effect similar to that of a generator.

Explosions can occur in any part of a process involving dust, milling, drying, conveyance or storage in silos, although the greatest risk and known incidents occur in bucket elevators.

Cereal silos with bucket elevators.

How to Prevent Explosions

Prevention is at the following sources:

1. Sources of dust.
2. Sources of ignition.
3. Safety of equipment and materials.

How Esbelt Collaborates in Preventing the Risk of Explosions:

All bucket elevator belts manufactured by Esbelt, **ESPOT, DRAGO** and **FEBOR**, are **ANTI-STATIC** in accordance with standard ISO 284, i.e. they do not accumulate static electricity but just the opposite: they facilitate its discharge into the elevator structure, thus preventing sparks which could act as a source of ignition for an explosion. The following esbelt belts are certified in accordance with:

DIRECTIVE 94/9/EC
As non-electrical components used in equipment for operation in **potentially explosive atmospheres.**

ATEX - Category 2
in accordance with **EN 13463-1: 2001 - EN 13663-5: 2003**

The certification is issued by an official organisation notified with the number LOM 07ATEX6087U and LOM 07ATEX6001U and covers potentially explosive atmospheres consisting of mixtures of air with inflammable substances in the form of gases (G) and dusts (D): ATEX Ex II 2GDc.

Belt type	Nº of plies	Top cover thickness mm	Bottom cover thickness mm	Belt thickness mm	Breaking load N/mm	Working load at 1% elongation N/mm	Working load at 1.5% elongation N/mm
DRAGO 20CC	2	1,00	1,00	4,10	200	20	28
DRAGO 30CC	3	2,00	1,00	6,20	300	30	40
DRAGO 40CC	4	2,00	1,00	7,40	400	35	50
ESPOT 20CC	2	1,00	1,00	4,10	200	20	28
ESPOT 30CC	3	2,00	1,00	6,20	300	30	40
ESPOT 40CC	4	2,00	1,00	7,40	400	35	50
FEBOR 21CC	2	2,00	1,00	5,00	200	20	28
FEBOR 31CC	3	2,00	1,00	6,10	300	30	40
FEBOR 32CC	3	2,75	1,50	7,40	300	30	40
FEBOR 41CC	4	2,00	1,00	7,40	400	35	50
FEBOR 9101	3	3,00	1,00	9,60	900	75	130

ESPOT belt working in a cereal factory.

Buckets fitted to a belt conveying fodder.

Our elevator belts offer resistance to abrasion, vegetable oil and fats and mineral oils. All white belts are completely non-toxic and meet FDA requirements. The smooth, regular covers are less adherent to the conveyed products than classic rubber or rubber-canvass belts.

Stabilised polyester fabrics, resistant to moisture and with almost non-existent stretch rates, i.e. they do not requiring constant tightening and shortening.

Buckets for Elevators

Our **NEUCAN** and **VERCAN** buckets, made from plastics (polyethylene and polyamide) prevent sparks from forming due to knocks or rubbing with the elevator structure.

Some of the advantages over metal buckets are: they do not rust; resistance to chemical products; the lower adherence of their walls facilitates unloading and minimises product encrustation; they weigh less; and in the case of accident (sticking) the plastic breaks instead of the belt.
Range from widths of 100 mm or 315 mm.

L'explosion de silos, près de Bordeaux, enterre treize personnes sous des tonnes de béton et de grain.

PARIS - 21/08/2007

PARIS– Le corps d'une femme a été récupéré hier soir sous les décombres de silos à grain qui ont explosé accidentellement à Blaye, un village de la Gironde, dans le sud-ouest de la France, très près de Bordeaux. Douze autres personnes étaient encore portées disparues sous des tonnes de grain et de béton. Une autre victime a été hospitalisée dans un état critique. L'explosion a fait s'écrouler une partie des silos de 590 mètres de hauteur et presque 200 de longueur, construits en béton armé. La cause de l'explosion n'est p
connue, mais les hypothèses suggèrent un pro
tricité statique. En effet, lors des travaux de c
de déchargement des silos, le frottement entr
peut provoquer des étincelles et allumer les
poussière qui se forment à l'intérieur des rés
L'explosion est alors immédiate et de grand

EXPLOSIÓN EN SILO EN PARANAGUÁ (BRASIL)

Noviembre 2001

Trabajos en el puerto fueron interrumpidos; 2 víctimas quedaron en estado grave.

La explosión de uno de los mayores almacenes de cereales en Paranaguá - Brasil, paralizó el corredor de exportaciones del puerto el día 16 de noviembre de 2001.

El almacén pertenece a la exportadora Comercio e Industria Brasileña (Coimbra) y queda en el corredor de exportación del Puerto de Paranaguá. Al momento de la explosión, cinco mil toneladas de maíz estaban siendo descargadas.

美国佐治亚州萨凡纳市郊区的一家制糖厂 2 月 7 日晚上发生爆炸并起火。截至当地时间 8 日下午　消防人员已找到 4 具尸体　至少 50 人受伤,由于一些人伤势非常严重　死亡人数可能还会上升。目前事故原因仍在调查中　厂方认为是易燃的糖尘引发了爆炸。

据美国媒体报道　截至 8 日下午　消防人员已从工厂废墟下的疑道中找到 4 具尸体　他们的身份尚不清楚。医院透露　目前至少有 40 人被送往医院进行治疗　许多人仍情况危急　靠呼吸机维持生命。爆炸引发的大火造成许多人被烧伤　其中一些伤势严重的人已被空运到附近奥古斯塔的一家烧伤治疗中心　该中心一位发言人称　其中 16 人情况危急　有 3 人病情十分严重。

警方称　据目前所知　厂房内至少 4 人失踪。救援人员仍在寻找死伤人员　但由于爆炸和大火造成工厂建筑结构严重损坏　搜救工作受到影响　消防人员还不敢贸然进入爆炸厂房内　等 9 日动用大型机器设备清除残骸后可能将发现更多尸体。调查人员正在对事故进行调查　目前尚无法确定究竟是什么引发爆炸。这家制糖厂的首席执行官约翰·谢普特　JohnSheptor　表示　爆炸发生在储存糖炼糖的仓库中　有可能是制糖过程中产生的糖尘引起的。如果环境太干燥产生静电　糖尘就会变得易燃　一旦引发爆炸　造成的破坏性后果和一枚炸弹一样。

专家指出　糖尘是一种易燃物质　静电、金属工具摩擦产生的火星或烟头都可以引发爆炸。在过去 30 年中　美国共发生 300 多起粉尘爆炸事故　造成在谷物粮仓、制糖厂和食品加工厂工作的 120 多名工人死亡。专家们说　如果加工时清除细微粉尘　大部分事故都可以避免发生。美国化学安全局　U.S. Ch
Safety Board　表示将派调查小组前往该糖厂进行调查。

FOUR DEAD IN SUGAR REFINERY BLAST.

FRIDAY fEBRUARY 8, 2008

ATLANTA (Reuters) - Four people died, four others were missing and more than three dozen were injured in an explosion and fire at a sugar refinery in the U.S. state of Georgia, authorities said on Frid
Portions of the riverfront plant collapsed in Thursday's blast, which may have happened in a sugar storage silo or bagging room at the Imperial Sugar Co. plant in Port Wentworth, a suburb of Savannah.

Explosion in Silo von Stärkefabrik

4.3.2008

Im Silo einer Stärkemittelfirma in Wädenswil ZH ist es am Abend auf zu einer Explosion gekommen. Dabei wurden Teile des Dachs auf die Strasse geschleudert. Die Ursache für die Explosion ist nicht bekannt. Verletzt wurde niemand. Laut der Kantonspolizei Zürich geriet durch die Explosion auch der Dachstock des Gebäudes in Brand. Dieser konnte zwar schnell unter Kontrolle gebracht werden, der Schaden sei jedoch erheblich. Die Seestrasse wurde während Stunden in beide Richtungen gesperrt. Weil weitere Gefahren nicht ausgeschlossen werden können, bleibt die Strasse voraussichtlich auch am Morgen gesperrt.

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