**FIRE PROTECTION IN TEXTILE AND NON-WOVEN MILLS**

More than 70% of EU imports of textile and clothing come from Asia. Many Asian workers have to work in sweatshop conditions, but the issue appears in global media only when major fatal accidents occur, like that at Rana Plaza in Bangladesh, in 2013.

Long working hours, low wages, lack of regular contracts, and systemically hazardous conditions are often reported. Trade unions, when allowed, are unable to protect workers.

Not all Asian countries exporting textile and clothing to the EU have ratified "Fundamental" ILO conventions and their concrete application is far from the norm. UN Guiding Principles on Business and Human Rights, and OECD Guidelines for Multinational Enterprises fix good standards of corporate social responsibility for Western brands operating in such countries, but are not binding and do not provide for sanctions if not applied. In practice, they have failed to defend workers' rights.

A number of measures have been suggested to change this situation, including in repeated European Parliament resolutions. Such measures would require action by Asian governments, international brands and the importing countries. They include greater union rights, more regular work, brands doing more due diligence when dealing with contractors, efficient and more cooperative audits, more stable purchasing practices, making some guidelines and principles legally binding, and putting pressure on Asian authorities to have workers' human rights better respected

**Fire Risk**

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| Streaming Sparks | Textile and nonwoven mills have experienced fires in the Opening, Blending, Cleaning, Carding, Spinning, Weaving, and Filtration areas since the introduction of electrically operated machinery. In the past, these fires were controlled by alert mill employees who were able to bring manually operated fire  |

extinguishers and fire hoses to the machine and fight the fire. Even if the fire was relatively large, it normally only damaged one or two machines. With the introduction of automated high speed Production Machinery and Air Filtration systems, the product moves from the Opening through Carding processes without being touched by humans. The material is transported at speeds ranging from 10 meters per second to 25 meters per second. If a fire is started in one achine it can be transported to the next machine in less than one second.

The fire can be spread through a complete Blow Room installation in less than one minute. This is normally too fast for the limited personnel in the area to react and stop the machinery so that they may fight the fire. Even if the machinery could be stopped quickly enough by an operator, the machines are normally completely enclosed in their housings, therefore making it impossible for a person to discharge an extinguisher or fire hose into the machinery.

As a result of the high stock transport speeds, the enclosed machinery, and a reduced number of personnel in the area - when fire strikes an automated Blow Room installation it is possible to burn out several machines as well as the filters. With the increased cost and efficiency of the new automated machinery, most modern Blow Rooms have only two or three lines of this machinery. Therefore, when a line of machinery is burned out, the production of the Blow Room is reduced by one half or one third until the machinery can be repaired or replaced. This large drop in production underlines the need for serious fire protection planning by production-conscious mill managers.

**Fire Prevention**

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| Burned Mill Machine | It is far better to prevent the fire than it is to fight it after it has started. Therefore, the first steps in fire planning must include such things as machinery maintenance to assure that the machine will not start a fire by itself. Fire can start as a result of loose parts or poorly aligned bearings and shafts.  |

If proper maintenance is practiced, most fires of a machine origin can be eliminated.

This not only includes alignment of parts, but also proper lubrication and careful attention to electric motors.Although it is frequently difficult to have complete control of accumulations of waste, it is important that this “housekeeping” portion of fire prevention be observed. Periodic cleaning around machines is of extreme importance.

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| Burned Mill Floor | Careful attention to broken wire bale straps occurring upon opening of the bales is extremely important. Broken pieces of wire bale straps are frequently introduced into opening machines, and will almost always start fires.  |

This is the direct responsibility of the person charged with opening the bales prior to introducing them into the machines.

Automatic fire protection systems on a Traveling or Circular Bale Opener will detect and suppress sparks and fire both inside the Bale Opener as well as on the cotton laydown.

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| Mill Destroyed by Fire | Magnets and heavy material traps located in the stock transfer ducts are a way of reducing the problem of transporting fire-starting material in the stock ducts. A more effective way of eliminating metal is by using a high speed Metal Detector that will operate a pneumatic diverter.  |

There are now Metal Detection and Diversion systems available on the market that will detect ferrous and non-ferrous metal as small a 2mm and divert it into a collector box less than 2 meters away. These high-speed diverters occupy less than 4 meters of total duct space. Even after all precautions have been taken, fires will continue to be a textile mill problem. These fires are caused by material “choke ups” in rotating machinery which will cause friction induced fires. It is almost impossible to prevent every fire-starting piece of foreign material from entering the process (such as stones), and even good maintenance practice will not prevent every machine malfunction from occurring.

## Fire Detection

When a fire does occur, it is essential to detect the fire as quickly as possible and to control it. In addition to controlling the fire, the machinery must be stopped in order to prevent the passage of the fire from one machine to another, and alarms must be sounded to alert the personnel in the area.

In the early days of automatic textile fire protection, traditional smoke detectors were used in the belief they would be able to sense the large quantities of smoke generated in a textile fire. However the maintenance on these detectors, resulting from dust and lint entering the detectors, made their use prohibitive. These smoke detectors were not designed to operate in a lint-filled atmosphere, and later extensive testing was conducted on various types of heat, ultra-violet, and infrared detectors.

## Fire Control

The fire control systems normally used in textile machinery applications are Dry Chemical, Carbon Dioxide and FE-227ea. All of these agents are effective on textile fires when used properly. Each has advantages and disadvantages, and the decision on which to use should be made with these advantages and disadvantages in mind.

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| AV10 Valves | However, please be aware that none of these extinguishing agents can be guaranteed to completely extinguish any textile fire when a large volume of material is involved. These extinguishing agents are designed to control and prevent spread of textile fires. In most cases they actually extinguish the fire, although the user must be aware that some  |

fire may remain in the machine after discharge. The material in the machine must be removed to make certain that no fire remains in the machine before restarting.

In addition to automatic fire extinguishers, high speed Spark Diverters can also be located after the bale opener and before the mixers and chute-fed card lines to prevent embers from entering a machine.