Conveyor Systems – Property

The use of conveyor systems in the workplace presents both benefits and challenges to building occupiers.

This Loss Prevention Standard outlines the main risk concerns in relation to conveyors, with practical guidance to help reduce the potential for loss or damage.

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Conveyor Systems – Property

Introduction



Conveyors are a common form of mechanical handling equipment used across a wide range of industries and sectors, including manufacturing, retail, warehousing, and logistics. They transport materials, stock, and products efficiently from one location to another, often over significant distances and, in some cases, through purpose-built fire compartments.

They are available in a variety of types, sizes, and configurations depending on the application and operational environment, and can be specifically designed for the location, assembled using 'off the shelf' products, or as commonly found, a blend of standard and bespoke systems.

Whilst traditionally limited to single height systems across manufacturing industries, the expansion of automated storage and retrieval systems in recent years has resulted in many warehouse environments now featuring extensive multi-level conveyor systems, bringing unique risk management challenges.

This document discusses the risks associated with conveyor systems and provides risk management guidance to help reduce the potential for loss events and business interruption.

Note: This Loss Prevention Standard relates to conveyor systems and is focussed on asset loss prevention and related risk management guidance. It is not intended to address liability/general liability exposures. The presumption is that all local regulatory territory requirements, and compliance with national/local building regulations, codes, or standards take precedence and have, or will be, met. In territories where local authorities have jurisdiction, compliance with applicable laws and regulations is assumed as a minimum requirement. The recommendations in this document are intended to supplement, not replace, local requirements.

Understanding the Risks

The following are some of the common risks and exposures associated with conveyor systems that cause frequent loss events:

- **Overheating**. Friction from misaligned belts, slipping or jamming, lubrication issues, accumulation of combustible material, e.g., lint, dust, grease, etc., around moving parts, uneven, overloading or seizing bearings/gears and motors.
- **Electrical**. Electrical arcing, malfunction, or overload and static.
- **Hot Materials.** Materials can accumulate heat during manufacturing, heating, and sealing processes. Hot materials can also be discharged onto conveyors from adjacent or overhead processes.
- **Hot Work**. Sparks from cutting and welding operations can ignite materials or dust on conveyors or associated components.

- **Battery Fires.** Lithium-ion battery powered stock picking equipment in automated storage retrieval systems can ignite as a result of damage, inherent faults, charging issues, etc.

  Refer to the Aviva Loss Prevention Standard **Lithium-ion Batteries - General Considerations** for further guidance.
- **Hydraulic Fluids.** The release of hot pressurised hydraulic fluids in the form of a vapour cloud can ignite upon contact with hot surfaces.

The potential for fire propagation can be aided by:

- **Combustibility.** Conveyors can feature combustible elements such as plastics, rubbers, hydraulic oils, lubrication oils/grease, lint build-up, etc., notwithstanding combustible goods, materials, packaging, etc., on the conveyor.
- **Travelling Fire.** Fire can spread through premises as the conveyor continues moving.
- **Location.** Conveyors are often sited in raised locations, or at ceiling height, with limited accessibility; this can make initial fire-fighting attempts challenging.
- **Encasement.** Conveyors can be encased/enclosed to help control emissions such as dust and lint, or for soundproofing purposes. This can hinder fire-fighting efforts and also increases the potential for explosion incidents.
- **Fire Load.** The volume of goods or materials moved by conveyor systems may increase the fire load within the premises.

Types of Conveyors

There are many different types of conveyors and conveyor systems, depending on the end use application. They can be electrically or pneumatically powered, manually operated or gravity driven. Common types include, but are not limited to:

Belt Conveyors. These are the simplest type of conveyor system and utilise a continuous belt, typically made of rubber or fabric, to move products, goods, etc., between processes or to and from storage locations.

Roller Conveyors. Roller conveyors work by using a number of free spinning rollers connected to a supported frame. Goods can move using gravity or via momentum.

Chain Conveyors. These systems use chains and sprockets to power the conveyors and are typically used in heavy industry and manufacturing plants.

Screw or Auger Conveyors. Mainly used for moving bulk materials such as grains, pellets, powders, etc., via a rotating screw/auger. These conveyors are commonly enclosed to avoid waste and reduce dust levels.

Bucket Elevators. These conveyors use a number of buckets attached to a moving belt or chain and are commonly used to move aggregates or agricultural products.

Spiral Elevators. Typically utilised in food manufacturing, these conveyors feature a continuous spiral-shaped belt, rollers, or chain to transport goods, largely in space limited environments.

Apron Conveyors. These comprise overlapping metal plates and are commonly used in heavy industry, aggregates handling, etc.

Management Programmes

Management programmes provide a structured approach to identifying, controlling and reducing risks associated with routine operations, planned changes and emergency events. Adherence to management programmes, together with associated rules and procedures, can help organisations reduce the likelihood and impact of property damage and business interruption losses.

The following management programmes should be considered:

- **Risk Assessments**. As required in accordance with local or national regulations, standards or codes.
- **Material Damage Risk Assessment**. This ensures that management programmes, risk controls, detection and protection systems, etc., are sufficient and reflective of the potential property loss estimates.
- **Managing Change**. This helps ensure that any significant change to conveyor systems or associated buildings, processes and equipment are managed with minimal disruption to activities and the inadvertent introduction of new or increased hazards.
- **Hot Work Operations**. Poorly controlled hot work operations can result in fire, explosion and business interruption events. Hot work should be managed in accordance with the Aviva Loss Prevention Standard **Hot Work Operations**.
- **Emergency Response Procedures**. Robust emergency response procedures help minimise the consequences of an incident or loss event.

Further guidance can be found in the following Aviva Loss Prevention Standards:

- **Material Damage Risk Assessment**
- **Business Continuity – Step 4: Business Impact Analysis and Risk Assessment**
- **Managing Change – Property**
- **Hot Work Operations**
- **Emergency Response Teams - Property**

Design and Construction

Conveyor systems should be designed and built to restrict fire spread and smoke contamination. The design, construction, commodities conveyed, location, speed and incline of the conveyor may all influence fire and smoke propagation, the ability of detection and fire protection systems to respond, and the access available for firefighting.

Construction. The conveyor system should be made of non-combustible materials where available and designed to withstand a fire without collapse.

- Ensure the supporting frame and structure are non-combustible.
- The use of intumescent finishes to conveyor supports should be considered if there is a significant risk of collapse during a fire event, resulting in damage to critical infrastructure, equipment, fire protection systems, fire compartmentation, etc.
- Use non-combustible conveyor belts. If this is not possible, use fire-retardant belts if operating parameters allow their use.
- If an enclosure around or over the conveyor is needed, ensure the materials are non-combustible.

Location. Where possible, do not position one conveyor above another (either parallel to or crossing over).

- Doing so may create areas that are shielded from any ceiling sprinklers, and in the event of collapse potentially result in increased damage.
- Where positioning one conveyor over another cannot be avoided, sprinkler protection, where present, should be extended to beneath any significant conveyor obstructions.
- Do not locate conveyor systems directly over critical infrastructure, machinery, etc.
  - ✓ Consider what exposures exist to the conveyor by way of critical plant, other utilities in proximity, or the building structure, etc., and what infrastructure, equipment, critical processes, etc., would be exposed should the conveyor system catch fire, collapse, etc.
- Conveyor system(s) running at high level or underground, through tunnels or below galleries can also hinder manual firefighting efforts.
  - ✓ Open conveyors are normally preferred as they provide visibility for fire detection and better access for firefighting.
  - ✓ Enclosed conveyors can act as a flue which may prevent heat from being released or firefighting hoses being deployed.
  - ✓ Where there is a risk of a fire leading to an explosion (deflagration to detonation transition), enclosures can also lead to significantly more damage.
  - ✓ When enclosed conveyors are used, localised fire suppression is often the most effective fire protection solution.
- Avoid vehicle routes or parking around and under conveyor structures.
  - ✓ Protect vulnerable conveyor(s) and support structures against impact damage.

Compartmentation. Avoid bypassing any fire compartment walls, floors, or fire barriers.

- Where this is not possible, automatic fire shutters should be installed at conveyor openings to achieve a fire resistance rating commensurate with the fire compartment wall, floor, or barrier.
  - ✓ Fire shutters should only be held open with special devices that release, prompting closure, automatically when the fire alarm and/or automatic fire sprinklers activate. Shutters that operate via a fusible link or other similar devices are not recommended due to their delay in operation.
  - ✓ Modifications may be required to the conveyor system to retract or drop down upon activation of fire detection and/or protection systems to allow full closure of the fire shutters and retain the integrity of the shutter protection. This should be factored into the design specification.

  Refer to Aviva Loss Prevention Standards **Fire Compartmentation** and **Fire Doors, Shutters, Dampers and Collars** for further guidance.
- Conveyor control and monitoring systems should be provided to prevent conveyed material from blocking the operation of any shutters.
- Conveyor tunnels linking buildings should be protected at either end in a similar manner.

Design Considerations.

- Equipment should be suitably rated for hazardous environments where applicable, e.g., combustible dusts.
- Hydraulic conveyor systems should utilise non-combustible hydraulic fluids where possible.
  - ✓ This reduces the overall fire load presented by the conveyor system and the potential for fire propagation.
  - ✓ The potential for flammable vapour cloud release attributed to pressurised leaks of hot hydraulic oils is also negated.

- Consider ventilation/heat and smoke extraction.
  - ✓ Combustible conveyors can produce intensely hot fires which emit dense, black, toxic smoke when ignited. This smoke can severely hamper manual firefighting, particularly in underground or enclosed systems where entry and means of heat venting are limited.

  Refer to Aviva Loss Prevention Standard **Heat and Smoke Venting Systems** for further guidance.
- The speed of the conveyor may directly influence the rate of fire spread, which in turn, influences how quickly fire detection and protection systems need to respond.
  - ✓ Where conveyors are inclined, fire growth may be exacerbated by the flue effect. Inclines of more than 30% allow for a faster spreading flame front.
  - ✓ Ensure this is considered within the design of fire detection and protection systems (cause and effect).
- Do not use conveying systems to transport utilities such as grouped electric cables, flammable gases or ignitable liquids.

Monitoring. Condition monitoring via belt conveyor monitoring should be considered, particularly for fast-moving systems with increased hazard exposure and / or criticality.

- These systems monitor the conveyor systems for issues such as bearing temperature, speed and motion, alignment of belts and tracks, damage/tearing, etc.
- The monitoring equipment should provide an audible alarm and notify key personnel of any detected issues.
- Where the process allows, such systems should be interlocked to isolate the system safely upon actuation of a detection/monitoring device.

Self-Inspection

Conveyors should be included as part of the premises formal self-inspection programmes. This can help with early identification of damage, faults, wear, leaks, etc., that may lead to more significant damage. In addition, checks should be carried out at the beginning of each shift to check for:

- Loose or stuck rollers.
- Frayed belts.
- Material accumulating on or under belts, motors, bearings and supporting structures.
- Unusual noise or vibration.
- Hydraulic oil leaks (where present).
- Excessive debris, dirt, dust, or lint accumulation.
- Combustible material stored beneath conveyors.
  - ✓ If such storage cannot be avoided, provide automatic sprinkler protection.
- Vegetation growth that exposes external conveyor(s) and support structures.
- Unnecessary sources of fire ignition, such as smoking around combustible conveyors or conveyors transporting combustible or explosive materials, should be eliminated.

Adequate access should be provided to allow operatives to walk the entire conveyor system, and where deficiencies, blockages, material accumulations and/or spillages are noted, remedial action should be taken promptly.

The use of photographic evidence when undertaking such inspections can prove invaluable. Thermographic camera inspections can also prove invaluable for such inspections, e.g., checking for hot spots or overheating.

Refer to Aviva Loss Prevention Standards **Self-Inspections**, **Use of Thermographic Cameras - General Considerations** and **Checklist** for further guidance.

Maintenance

- Ensure an appropriate regime of Planned Preventative Maintenance (PPM) is in place for all conveyor components (e.g., belts and tensioners, motors, gears, and bearings, electrical components, etc.) based on Original Equipment Manufacturer (OEM) instructions and industry best practice.
  - ✓ The fire hazards associated with some conveyors can increase with age. For example, an older belt conveyor can become coated or impregnated with oils or combustible residue over time, increasing its combustibility. Metal belts on travelling ovens expand with age and need more regular servicing. Older conveyors may also be more prone to mechanical breakdown and replacement parts may be harder to obtain, increasing the replacement lead time.
- Earthing continuity should be subject to at least monthly checks, or more frequently if static discharges could ignite combustible dusts or flammable vapours.
- Adequate spares should be held for any conveyor equipment with potential long replacement lead times, such as complex or specialised gear sets and tensioners, along with spare belting to repair or replace damaged portions of any conveyor system.
- Do not use heat-generating equipment. e.g., blowtorches, to remove worn belts.
  - ✓ Frayed belt fibres should instead be removed using cutting equipment and sealed.

Refer to the Aviva Loss Prevention Standard **Maintenance Regimes** for further guidance.

Detection and Fire Protection Systems

Automatic Fire Detection

Automatic fire detection and fire alarm systems should be designed, in accordance with local or national regulations, standards or codes, for the anticipated fire signature, and be capable of quickly detecting a travelling conveyor fire, e.g., linear heat detection or flame detectors.

- Locating and spacing of automatic fire detection should be based upon the combustibility of the conveyor and the commodities conveyed, including the packaging, as well as the speed of the conveyor relative to the speed of detection needed to actuate any fixed fire protection systems and/or shut down the conveyor to minimise fire spread.
- Automatic fire detectors should be located so as to avoid impact damage from the conveyed material.
- A means of manually raising the fire alarm should also be provided.

Note: Any plans to change the existing fire detection system or install a new fire detection system should be discussed with your insurer, Insurance Broker or jurisdiction having authority.

Fire Protection Systems

Sprinkler protection within premises featuring conveyor systems presents several challenges:

- If the clearance distance from the conveyor to the fire protection is too great, and the seat of the fire is moving away from the protection as it travels, activation/actuation of the sprinkler head(s) may be delayed.
- Alternatively, and depending on the conveyor speed and fire size/energy, too many heads could activate.

In either scenario, the sprinkler system could be compromised, meaning the fire may not be promptly suppressed or adequately controlled.

In addition, the majority of automatic sprinkler systems are designed to control rather than extinguish a fire and require some form of manual firefighting intervention. Fire and Rescue Service attendance may be delayed due to changes in attendance policy or location, and deployment and targeting of the fire may be further complicated by the presence of enclosures, potentially preventing water reaching the seat of the fire.

Despite these challenges, an automatic sprinkler system, designed and installed in accordance with local or national regulations, standards or codes, remains the most effective fixed fire protection system to protect conveyors, although the type of protection needed will likely be dependent on the design and construction of the conveyor, and the commodity being conveyed.

A wet pipe sprinkler system is the most reliable sprinkler system and has the least delay before water can suppress a fire at its seat. With this system design, the sprinkler pipework is normally charged with water, and as soon as the fire activates a sprinkler head in the room, water is immediately available to suppress the fire at its seat.

Where an existing automatic sprinkler system is already installed, the design should be adequate for any changes in risk profile associated with conveyor systems. A suitably accredited sprinkler maintenance company should be asked to confirm that the coverage, sprinkler density, water supply demand and water supply duration are likely to be adequate and provide recommendations for enhancing the protection where necessary.

Additional drainage or conveyor pitch may be necessary to help prevent collapse due to overloading from water weight from either sprinkler discharge or fire hose streams. Wherever conveyors operate underground, diversion curbing at grade level to intercept any water rundown from the aboveground segments should be provided. Adequate sump pump or dry well facilities to remove water should also be installed.

Refer to the Aviva Loss Prevention Standard **Sprinkler Systems - How They Operate** for further guidance.

Note: Any plans to change the existing fire detection system or install a new fire detection system should be discussed with your insurer, Insurance Broker or jurisdiction having authority.

Explosion Detection and Suppression Systems

Where enclosed conveyor systems are used to transport commodities that produce finer particles and dust with explosive potential, consideration should be given to installing spark detection and suppression systems within and through the enclosure.

Such systems provide rapid detection of sparks, typically generated from worn moving parts, bearings, trapped metals or aggregates, and emit a suppression agent or watermist to suppress the spark and/or reduce the oxygen levels within the enclosure, often with little impact to production activity.

- Any such systems should be tested and certificated to an approval standard such as:
  - ✓ FM3265 Examination Standard for Spark Detection and Extinguishing Systems.
  - ✓ NFPA 69 Standard on Explosion Prevention Systems, and
- Be designed, installed, commissioned, and maintained by a competent and reputable installer with experience in installing spark detection and suppression systems within enclosed conveyor systems.

Note: Explosion Detection and Suppression Systems that do not conform to a published performance standard will require a bespoke design specification modelled on the equipment to be protected. The installation of such a system should be discussed with your insurer and broker for review and approval prior to any works commencing.

Automatic Shutdown

Automatic interlocks should be provided to shut down conveyor systems and raise an alarm to a constantly attended location:

- Upon actuation of any automatic detection or fire protection system.
- If a fault is detected through predictive or condition-based monitoring systems.

Contributing conveyors should also be interlocked so that other operating conveyor cannot discharge material to a stopped downstream conveyor. Where heated materials are discharged onto the conveyor, interlocks should be installed to shut down the feed system if the material exceeds a safe temperature.

Additional interlocks should be installed to prevent the conveyor from operating where associated critical safety systems are not operating in higher-risk activities, e.g., extract ventilation interlocks for travelling ovens, paint spraying booths, etc., or if fixed fire protection is isolated.

In addition to automatic interlocks, manual shutdown capability, e.g., emergency stops along the conveyor and at either end, should be provided. Where it is risk assessed as being safer for conveyors to continue to operate in the event of a fire, e.g., travelling ovens, etc., conveyors should be configured to divert burning materials to a safe, preferably external area, accessible for firefighting.

Alarms

Alarms associated with automatic detection and fire protection systems should raise a site fire alarm to ensure there is an appropriate emergency response and escalation if needed. If not already in place, consider connecting the alarm to a constantly attended location or an approved Alarm Receiving Centre. An accredited fire alarm/fire protection system installer can provide further guidance and assistance.

Impairments

Ensure any impairments relating to fire detection and protection systems are reported to your Property Insurer and Insurance Broker. Temporary changes may be necessary to some arrangements whilst impairments are ongoing.

Refer to Aviva Loss Prevention Standard **Impairment Management** or further guidance.

Business Continuity

Every business should have a formal Business Continuity Plan in place. This should be reviewed to ensure disaster recovery and continuity arrangements remain adequate. Any actions generated should be addressed promptly.

Refer to Aviva Loss Prevention Standard **Business Continuity - Seven Steps to Continuity** for further guidance.

Checklist

A generic **Conveyors Checklist** is included in Appendix 1 available, which can be tailored to organisation's needs.

Contact Information

Canada

Please visit Aviva Risk Management Solutions | Aviva Canada or email us at arms.canada@aviva.com

Ireland

Please visit Insurance Risk Management | Business Risk Management Insurance - Aviva Ireland or Email us at armsireland@aviva.com

United Kingdom

Please visit Aviva Risk Management Solutions or email us at riskadvice@aviva.com. To speak to one of our advisors, call 0345 366 6666.*

*The cost of calls to 03 prefixed numbers are charged at national call rates (charges may vary dependent on your network provider) and are usually included in inclusive minute plans from landlines and mobiles. For our joint protection telephone calls may be recorded and/or monitored.

Specialist Partner Services

Aviva have created a network of Specialist Partners to complement our in-house capabilities and to enable our policyholders to benefit from a wide range of risk management solutions at preferential rates and terms. Together, we provide solutions to help with the significant challenges of modern-day risk management.

Note: These partner relationships are wholly for the benefit of our policyholders with no income to Aviva.

The following Specialist Partners provide products or services in relation to risk guidance provided, discussed or referenced in this Loss Prevention Standard.

Canada

- Electrical Service & Solutions Toronto | IPE Canada

For more information please visit: Our Specialist Partner Network | Aviva Canada

Ireland

- Pass Thermal Imaging Cameras and PAT Testing Equipment - Aviva Ireland

For more information please visit: Insurance Risk Management | Business Risk Management Insurance - Aviva Ireland

United Kingdom

- Fire risk assessment: Cardinus Risk Management
- Explosion/DSEAR Risk Assessments: Bureau Veritas
- Thermographic imaging and PAT testing: PASS
- Automatic fire detection and portable extinguishers: SECOM

For more information please visit: Aviva Risk Management Solutions – Specialist Partners

Standards, Sources and Useful Links

Canada

- Applicable federal, provincial or territorial occupational health and safety regulations relating to combustible dusts, flammable substances and explosive atmospheres, together with the requirements of the Canadian Electrical Code (CEC) for hazardous locations.
- CAN/ULC-S524 — Standard for the Installation of Fire Alarm Systems
- CAN/ULC-S104 Standard Method for Fire Tests of Door Assemblies.
- NFPA 80 Standard for Fire Doors and Other Opening Protectives for installation, inspection, testing and maintenance requirements.
- FM Global Property Loss Prevention Data Sheets - 7-11: Conveyors
- NFPA 61 - Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
- NFPA 654 Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 69 Standard on Explosion Prevention Systems
- NFPA 72 — National Fire Alarm and Signalling Code

Ireland

- Part 8 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 – Explosive Atmospheres, which implements the ATEX Workplace Directive (1999/92/EC) and requires the assessment and control of explosion risks, hazardous area classification, and explosion protection measures.
- I.S. 3218:2013+A1:2019 Fire detection and alarm systems for buildings - System design, installation, commissioning, servicing, and maintenance and Amendment
- Fire shutter assemblies should meet the requirements of EN 16034: Pedestrian Doorsets, Industrial, Commercial, Garage Doors and Openable Windows. Product Standard, Performance Characteristics. Fire Resisting and/or Smoke Control Characteristics and the testing and evaluation requirements for LPCB approval and listing of fire door sets as detailed in LPCB Loss Prevention Standard LPS LPCB 1056 Requirements for the LPCB approval and listing of fire doorsets, lift landing doors and shutters or equivalent
- LPS 1048: Requirements for the approval of sprinkler system contractors in the UK and Ireland
- FM3265 Examination Standard for Spark Detection and Extinguishing Systems
- NFPA 69 Standard on Explosion Prevention Systems

United Kingdom

- Health and Safety Executive guide to The Dangerous Substances and Explosive Atmospheres Regulations 2002
- Fire shutter assemblies should meet the requirements of BS EN 16034:2014 Pedestrian Doorsets, Industrial, Commercial, Garage Doors and Openable Windows. Product Standard, Performance Characteristics. Fire Resisting and/or Smoke Control Characteristics and the testing and evaluation requirements for LPCB approval and listing of fire door sets as detailed in LPCB Loss Prevention Standard LPS LPCB 1056 Requirements for the LPCB approval and listing of fire doorsets, lift landing doors and shutters or equivalent

- BS 5839-1: Fire detection and fire alarm systems for buildings - Code of practice for design, installation, commissioning, and maintenance of systems in non-domestic premises
- LPS 1048: Requirements for the approval of sprinkler system contractors in the UK and Ireland
- FM3265 Examination Standard for Spark Detection and Extinguishing Systems
- NFPA 69 Standard on Explosion Prevention Systems

Additional Information

Loss Prevention Standards

These documents set out best practice recommendations to help reduce the likelihood and impact of losses.

Relevant Aviva Loss Prevention Standards include:

- **Material Damage Risk Assessment**
- **Business Continuity - Step 4: Business Impact Analysis and Risk Assessment**
- **Managing Change - Property**
- **Hot Work Operations**
- **Emergency Response Teams - Property**
- **Fire Compartmentation**
- **Fire Doors, Shutters, Dampers and Collars**
- **Heat and Smoke Venting Systems**
- **Self-Inspections**
- **Use of Thermographic Cameras - General Considerations**
- **Use of Thermographic Cameras - Checklist**
- **Maintenance Regimes**
- **Sprinkler Systems - How They Operate**
- **Impairment Management**
- **Business Continuity - Seven Steps to Continuity**

Please visit Loss Prevention Standards to view the full library.

Aviva Risks Training Solutions (United Kingdom Only)

Aviva Risk Training Solutions, delivered through our Specialist Partner, SafetyCulture, provide free, bite-sized learning modules exclusively for Aviva policyholders.

Please visit Aviva Risk Training Solutions for further guidance.

Appendix 1 – Conveyor Systems Checklist

Location	
Date	
Completed by (name and signature)	

	Risk Assessment	Y/N	Comments
1.	Have the conveyor systems in your workplace been properly risk assessed due to the unique travelling fire risk they present? The risk assessment should consider: • If a fire was to start, how quickly would it develop and spread. • Overall type(s) and design of conveyor systems used and the associated fire risks (e.g., speed, incline, height, etc.) • Combustibility of the conveyor belts and products (including packaging) being conveyed. • Adequacy of existing fire protection/detection systems. • Adequacy of existing conveyor safety devices (e.g., interlocks/isolations, dust control, explosion venting, earthing, smoke venting, etc.) and any condition-based monitoring. • Age, condition, and maintenance regimes in place. • Fire compartmentation (protection of conveyor openings through compartment walls/floors, etc.). • Exposure to and from associated infrastructure. • Accessibility for firefighting (high level or underground, open, or enclosed). • Business impact/interruption following the loss of the conveyors.		
2.	• Are conveyors used to transport commodities that produce finer particles and dust with an explosion potential? • If so, has a specific explosion risk assessment been undertaken in accordance with regulations, standards or codes, etc?		

	Design and Construction	Y/N	Comments
3.	Are conveyor systems designed to restrict fire spread and smoke contamination?		
4.	Is the commodity (including any packaging) being conveyed combustible?		
6.	Are any conveyor systems, including the belts, covers, etc. combustible? **Note**: The use of fire-retardant conveyor belts is recommended, however all conveyors made of natural or synthetic rubber or plastics should be considered combustible.		
7.	Are there any conveyor systems running at high level or underground, through tunnels or below galleries which will hinder manual firefighting?		
8.	Are conveyor systems enclosed, operating at high speed or steeply inclined and therefore expected to result in rapid fire spread?		
9.	Has the conveyor systems been designed to enable adequate smoke venting and access for manual firefighting?		
10.	Are any conveyor systems passing through fire compartment walls or floors adequately protected to restrict fire spread from one compartment to another?		
11.	Are conveyor systems arranged one above another or cross over? **Note:** Where possible do not position one conveyor above another (either parallel or crossing over).		
12.	Are conveyors and support structures suitably protected against fire and impact damage from surrounding structures, plant and machinery, storage, or utilities?		
13.	Does the conveyor systems expose surrounding structures, critical plant, and machinery to damage in the event of fire or collapse?		
14.	Have conveying systems been used to transport other utilities such as grouped electric cables, flammable gases, and ignitable liquids?		
15.	Has drainage or suitable conveyor pitch been considered/provided to prevent collapse of the conveyor systems from the weight of water from sprinkler discharge or fire hose streams?		
16.	Have vehicle routes or parking in proximity to conveyor structures been avoided?		
17.	Are vulnerable conveyors and support structures protected against fire and impact damage?		

	Management and Maintenance	Y/N	Comments
18.	Are the conveyor systems (including the belts, rollers, motors, gears, and bearings, etc.) subject to planned preventative maintenance in accordance with the manufacturer's instructions?		
19.	• Are the conveyor systems subject to regular checks as part of the premises fire safety self-inspection programme? • If so, Is there a formal system for completing remedial actions where deficiencies, blockages, material accumulations and/or spillages are noted as part of the fire safety inspections?		
20.	Has any combustible storage and/or vegetation growth that expose conveyors and support structure been removed?		
21.	Are all fire detection, protection, and safety devices (e.g., alarms, monitoring systems, interlocks, etc.) associated with the conveyor systems also subject to regular inspection, testing and maintenance?		
22.	Are critical spares for conveyor systems held based upon the manufactures recommendations?		
23.	Has smoking been prohibited around all combustible conveyors or conveyors that transport combustible material?		
24.	Is hot work on or close to combustible conveyors or conveyors that transport combustible or explosive material prohibited or controlled by a formal procedure and permit to work system that meets Aviva standards?		
25.	Has the emergency response team been trained to handle emergencies involving conveyor systems, particularly where facilities have extensive enclosed or underground conveyor runs?		
26.	Are any changes to your conveyor systems or the products being conveyed (e.g., combustibility, weight, etc.) regularly reviewed as part of a formal Management of Change process?		
27.	Is there a formal procedure in place for managing fire protection impairments protecting conveyor systems?		

	Protection	Y/N	Comments
28.	• Is automatic sprinkler protection installed to protect the conveyor systems? • If so, is this based upon a risk assessment / insurer's requirements?		
29.	Where automatic sprinkler protection is provided at ceiling level only, has it been extended beneath any conveyor obstructions, exceeding 1 metre in width?		
30.	Where automatic sprinkler protection is provided, has it been designed to minimise the risk of impact damage from conveyed material?		
31.	Does the automatic sprinkler protection generate an alarm signal to a constantly attended location?		
32.	Are automatic sprinkler systems designed, installed, and maintained in accordance with recognised international standards?		
33.	• Are conveyors used to transport commodities with an explosion potential? • If so, are these protected in accordance with the guidance in NFPA 69 or FM 3265?		
34.	Have automatic fire detection systems been designed for the anticipated fire signature and able to quickly detect a travelling conveyor fire?		
35.	Has the locating and spacing of automatic fire detection been based upon the anticipated flame front, taking into consideration the combustibility of the conveyors and the commodity (including the packaging) as well as the speed of the conveyors relative to the speed of detection needed to actuate any fixed fire protection systems and/or shut down the conveyors to minimise fire spread?		
36.	Have automatic fire detectors been located to prevent impact damage from the conveyed material?		
37.	Does the automatic fire detection generate an alarm signal to a constantly attended location?		
38.	Is the automatic fire detection designed, installed, and maintained in accordance with recognised standards		
39.	Have portable fire extinguishers been provided which are appropriate for the occupancy and the materials being conveyed?		

	Protection Cont'd	Y/N	Comments
40.	Is belt alignment and belt speed monitoring installed, designed to interrupt driving power, and shut down conveyors upon sensing a serious misalignment or a 20% reduction in belt speed?		
41.	Are regular thermographic inspections carried out on known or frequent ignition zones, such as drive motors and bearings to identify potential problems?		
42.	Where bearings are inaccessible are fixed thermocouples installed to automatically monitor bearing temperature and interlocked to shut down conveyor systems?		
43.	Is vibration analysis undertaken for gears, belt drives, turning pulleys, tensioning pulleys to identify potential problems?		
44.	Are devices fitted which detect damaged belts (anti-rip detection)?		
45.	Are automatic interlocks provided to shut down conveyor systems and raise an alarm to constantly attended location upon actuation of the automatic fixed fire protection or detection systems and/or if a fault is detected?		
46.	Are automatic interlocks provided that prevent operating conveyors discharging material to a stopped downstream conveyor?		
47.	Are automatic interlocks provided where heated materials are discharged onto any conveyors to shut down the feed system if the material exceeds a safe temperature?		
48.	Are automatic interlocks provided to prevent conveyors working where associated critical safety systems are not operating (e.g., extract ventilation interlocks for travelling ovens / paint spraying booths, etc.) and/or if the fixed fire protection is isolated?		
49.	Are manual interlocks / shutdown (e-stops) provided along conveyors and at either end?		
50.	Where it is has been risk assessed as being safer for conveyors to continue to operate in the event of a fire (e.g., travelling oven), have conveyors been designed to be run manually after they are shut down to divert burning materials to a safe, external area, accessible for firefighting?		

	Business Continuity	Y/N	Comments
51.	Has the potential impact / interruption in the event of loss or damage of the conveyor systems been properly assessed as part of your organisations Business Continuity Plan (BCP)? You should consider: • How critical the conveyors are to the business. • What impact loss or damage would have. • Anticipate probable maximum damage or downtime. • What action is needed to restore normal operations. • What action is needed to maintain operations in the interim.		
52.	Where conveyor systems are critical to the business, have disaster recovery plans been developed to consider various business interruption scenarios and the contingency plans needed to restore normal operations as quickly as possible?		
53.	Do disaster recovery plans include risks from fire, explosion, mechanical breakdown as well as other natural catastrophe risks that potentially expose the conveyor systems (e.g., flood)?		
54.	Does the contingency plan outline how operations would be maintained for the interim period until normal operations are resumed?		
55.	Have any actions identified that would limit any potential business interruption or downtime, such as enhanced fire protection/detection, introduction of predictive maintenance or condition-based monitoring and critical sparing, etc., been implemented?		
56.	Additional Comments:		

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