

# Compacting and Baling Processes – Property

Many businesses use compacting and baling equipment as part of their waste management and sustainability strategies.

This equipment introduces several significant risks that require careful control, and this Loss Prevention Standard outlines those hazards and provides guidance on effective risk management.

# Compacting and Baling Processes – Property

## Introduction

Compacting and/or baling processes are undertaken at many business premises to compress and pack materials, such as card, plastic, paper and polystyrene inserts for waste handling, recycling, etc.

Compacting and baling offers a range of benefits, including:

- **Efficiency.** Saves storage space, essential on sites with limited space.
- **Costs.** Fewer recycling collections and potentially reduced charges at waste handling facilities.
- **Sustainability.** Supports recycling strategies, reduces transport costs and emissions.



However, these processes introduce a number of hazards that can lead to significant loss incidents. This document describes these hazards and provides risk management guidance to help reduce the potential for loss events and business interruption.

**Note:** This Loss Prevention Standard relates to compacting and baling processes undertaken to support other main business processes and is focussed on property loss prevention and related risk management guidance. It is not intended to address specialist or hazardous waste recycling operations or liability exposures. The presumption is that all regulatory requirements, such as fire risk assessments and compliance with local building regulations, codes, or standards, have or will be met.

## Understanding the Risks

Compacting and baling equipment is available to purchase or lease in a range of sizes, configurations and applications. They are commonly used in business premises to crush/compact card, plastic bottles, plastic wrap, polystyrene packaging and some light metals, e.g., aluminium and tin plate cans. Specialist applications are available including hazardous waste materials, medicinal/hospital waste, agricultural materials and food waste.

Whilst commonly integrated, separate compacting and baling equipment are also available, but typically positioned in line when large material handling operations are undertaken.

The equipment traditionally features one or more hydraulically operated rams that compress the materials which are then either baled before release or dispatched to an attached waste compartment, which can be collected or emptied when full. Other compression equipment is also available, such as pneumatically operated rams, hydraulically operated drum rollers to flatten goods and screw compactors, which can be used to separate liquids from containers.

Balers use plastic baling straps to bale materials, e.g., card, plastics, etc. for ease of handling, usually after a compacting process to reduce the size of the goods being processed. Goods are typically hand fed into smaller items of plant and conveyed into and out of larger equipment.

Common risks/exposures/issues include but not limited to:

**Electrical.** Faulty or damaged electrical wiring, overloaded circuits, damaged insulation can spark or overheat, often resulting in ignition. Many waste compactors are located externally and may be exposed to rainwater, which can access damaged electrical systems causing shorting, sparking, etc.

**Foreign Objects.** Metal objects may be crushed and spark or overheat leading to ignition. Other foreign objects include vaping equipment and other small lithium-ion battery powered devices which can ignite when crushed, producing volatile flaming.

**Combustibility.** The processed materials are often combustible and can support fire growth in the event of ignition. Polystyrene and some other plastic materials emit flammable vapours which can easily and quickly ignite.

**Self-heating.** Materials that are contaminated with certain oily residues can self-heat and smoulder inside compactors/balers.

**Housekeeping.** Accumulations of goods and poor cleaning procedures can result in significant fire loads located in proximity to equipment, potentially providing fuel in the event of ignition. Combustible dust can accumulate on and within the compactor, filters, control equipment, electrical supplies and light fittings.

**Maintenance.** Lack of maintenance can result in failed or damaged components, overheating, etc.

## Managing the Risks

### Risk Assessments

Ensure relevant fire/explosion related risk assessments have been completed and are reviewed regularly. In the United Kingdom this is typically addressed within:

- The various home nation fire risk assessment-based legislation.
- The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

**Note:** Statutory risk assessments are deemed the minimum requirement, and following the recommendations in this document, could help further reduce the risk and exposures.

### Material Damage Risk Assessment

Before initiating risk management controls or installing any additional fire detection and protection systems, an assessment of the anticipated/potential financial losses, for both material damage and business interruption exposures, in the event of a significant or catastrophic loss event relating to compacting and/or baling, should also be undertaken.

This helps ensure that risk controls, detection and protection systems, etc., are sufficient and reflective of the potential property loss estimates.

Refer to the Aviva Loss Prevention Standards **Material Damage Risk Assessment** and **Business Impact Analysis** for further guidance.

## Managing Change

The installation of compacting/baling equipment, and any associated works to accommodate the equipment, should be managed through a formal Management of Change process. This helps ensure all stages of the change are progressed with minimal exposure to the existing arrangements.

- These proposed changes should also be discussed with your Property Insurer and Insurance Broker.

Refer to the Aviva Loss Prevention Standard **Managing Change** for further guidance.

## Compacting and/or Baling Equipment

- Good quality equipment, with a proven track record, should be sourced from a reliable and reputable manufacturer/supplier.
- Installers should be experienced and reputable. Electrical works should be undertaken in compliance with national/local regulations, standards or codes.
- Ensure the banding used is compatible with the equipment and as recommended by the supplier.
- The equipment should feature safety features to help prevent material damage including:
  - ✓ Hydraulic pressure relief valves and containment for leaking fluids.
  - ✓ Safety guarding and interlocks
  - ✓ Accessible emergency buttons.
  - ✓ Interlocked metal and other foreign object detection
  - ✓ Interlocked obstruction detection

Ensure these safety features and interlocks are operational at the start of each shift and as part of self-inspection procedures.

- Ensure all equipment is subject to a formalised service/maintenance arrangement with a reputable company.
- Compacting and baling equipment must not be operated whilst unattended.

## Compartmentation

Compacting and/or baling equipment presents a number of risk concerns when located within buildings, requiring careful management.

Smaller integrated equipment types should preferably be located in a separate fire compartment, remote from other processes or storage/warehouse areas. Where this is not possible, a dedicated and demarcated area should be established, at least three metres from goods in storage and other equipment or processes.

Larger compacting facilities should be located in a detached, dedicated building wherever possible, or where this cannot be achieved, a dedicated fire compartment, providing a defined fire resistance (insulation and integrity) rating of at least 90 minutes.

**Note:** Increased fire resistance periods may be necessary depending on the activities undertaken at the premises and values exposed. Always discuss fire compartmentation requirements with your insurer and broker.

Refer to Aviva Loss Prevention Standards **Fire Compartmentation** and **Fire Doors, Shutters and Dampers** for further guidance.

Compactors, balers and associated equipment located externally should be rated as suitable for external usage and installed by competent, qualified and accredited contractors in accordance with local/national regulations, standards or codes.

Consideration should be given to the location of the equipment, ensuring that the risk of fire spread to buildings, valuable assets or materials is minimised. At least 10 metres separation is recommended.

### **Housekeeping**

Poor housekeeping standards, which includes storage arrangements, management of waste and cleaning arrangements, can increase the risk of fire and its subsequent impact on an organisation.

- Robust cleaning arrangements should be implemented. The compacting and baling equipment location should be cleaned throughout the day and at the end of each shift. This includes the areas around the equipment and any internal areas recommended by the manufacturer/supplier, beneath any conveyors and within any caged or guarded areas where waste may have accrued.
- Dust and other debris can accumulate around equipment, electrical switches and panels and on other surfaces. The location should be routinely deep cleaned to remove any dust and debris. The frequency of cleaning and equipment used, e.g. explosion rated vacuum equipment, should be based on a risk assessment.
- Waste should be removed to external waste stores at the end of each shift.

### **Material Storage - General Goods**

Stock, whether processed or awaiting processing should be stored in an orderly manner, e.g., within cages or palletised and in 'blocks' to help reduce the risk of fire spread.

- Storage 'blocks' should be no more than 50 m<sup>2</sup>.
- Each storage island should be separated by aisles of at least 3 metres on all sides including from equipment.
- Storage height should not exceed 1.8 metres.
- Processed stock should be removed from the premises at regular intervals and levels maintained as low as achievable.
- Stock stored externally should be at least 10 metres from buildings or other valuable assets. Consider arson exposures when storing near site boundaries, storing a safe distance from perimeter fencing, etc., can reduce the potential for arson related fire losses.

### **Material Storage - Polystyrene**

Where polystyrene packaging is being processed, additional risk control measures should be implemented. Such material, either when compacted or awaiting processing, presents a very significant fire risk. Considerations should include:

- Storage should be within vehicle trailers or dedicated shed buildings located at least 10 metres from main buildings and other valuable assets to prevent the material coming into contact with ignition sources or becoming windblown.
- Where stored in the open, stocks should be covered with fire retardant sheeting.
- Display appropriate warning signage to storage buildings, trailers or other storage areas alerting workers and contractors to the associated fire risks.
- Ensure lighting within storage buildings is low voltage, not located directly over stocks and well maintained.

Refer to the Aviva Loss Prevention Standard **Electrical Lighting - Property** for further guidance.

- Move stocks of polystyrene directly from stores to the compacting/baling location when needed. Do not stockpile pallets of polystyrene within 10 metres of main buildings or valuable assets.

- Limit stocks of polystyrene in the compacting/balling location to single pallets at any one time.
- Compacted polystyrene briquettes can release flammable vapours, including pentane, which is heavier than air and can accumulate in low-lying areas. This should be considered within risk assessments and appropriate risk controls provided, including suitable ventilation.
- Ensure very robust procedures are in place to prevent foreign objects, such as disposable vaping appliances, batteries, etc., entering processing equipment. Metal detection should be installed on conveyors supplying compacting equipment where there is any risk of foreign objects entering the waste stream, interlocked to power supplies to isolate safely upon activation/detection.
- Ensure smoking areas are at least 10 metres from storage buildings, trailers, etc.
- Hot works and other hazardous activities should be prohibited from stores and the compacting/baling location, unless all polystyrene stocks are removed.
- Consider the fire risks associated with the use of hot forklift vehicles carefully. Always use manual lift/pump trucks to move pallets of polystyrene materials within, and in immediate proximity of main buildings. Polystyrene can become windblown and come into contact with hot components, exhaust pipes, etc.
- Ensure workers are adequately trained on the fire risks associated with handling polystyrene materials including emergency response procedures.

## **Automatic Fire Detection and Automatic Fixed Fire Protection**

As a minimum, automatic fire detection should be provided in compacting/baling locations and connected to a reliable monitored and constantly attended location. There should also be a manual means of raising the fire alarm.

Based on the values and business impact exposure, automatic sprinkler protection fed by a dedicated and reliable fire water supply should also be considered. This should be designed in accordance with an internationally recognised standard **LPC Rules for Automatic Sprinkler Installations Incorporating BSEN12845** in the United Kingdom.

Compacting/baling equipment should be interlocked to fire detection and fire protection equipment to ensure safe isolation of charging equipment upon activation.

All designs and installations should be completed by approved/listed companies using equipment that is approved/listed to internationally recognised standards.

Refer to your property insurer and broker for specific guidance on automatic fire detection and fire suppression systems.

## Self-Inspection

There should be a formal and audited recorded self-inspection programme of compacting/baling locations to ensure:

- Site rules and policies on safe operation, safety features, material storage, etc., are being followed, and any arising issues are appropriately addressed.
- Housekeeping arrangements comply with site rules and procedures.
- Detection and protection equipment are functioning normally and not impaired.
- Other control measures, including fire shutters, remain in normal working order.
- Thermographic cameras are used to check for unusual heat patterns.

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

## Maintenance, Inspection and Testing.

- Ensure compacting/baling equipment and associated conveyor and electrical systems are subject to formal maintenance arrangements as per local/national regulations, standards or codes, Original Equipment Manufacturer (OEM) and/or supplier guidelines.
- Any hot works undertaken during maintenance works should be conducted in strict accordance with the Aviva Loss Prevention standard **Hot work Operations**.
  - ✓ Thermographic cameras should be used throughout the process and during fire watches.
  - ✓ Fire watches should be undertaken for up to 240 minutes after the hot works and only reduced where supported by a specific risk assessment.

Refer to Aviva Loss Prevention Standards **Maintenance Regimes** and **Hot Work Operations** for further guidance.

## Training

Training for workers and other personnel associated with compacting/baling operations is a key component, and should cover:

- What is normally expected to happen.
- What could happen in a number of typical and unusual emergency situations.
- How they are expected to respond.
- Own personnel and contractors or third parties.
- Hazards associated with the substances being stored.

## Emergency Response

An emergency response plan should be specifically developed to outline key responsibilities and actions in an emergency event relating to compacting/baling operations. The emergency response plan should include responses to all likely property and business interruption related events as described in this Loss Prevention Standard. It should also include the actions key individuals should take during emergency events.

The emergency response rules should be documented and training provided.

Refer to Aviva Loss Prevention Standard **Emergency Response Teams** for further guidance.

## Business Continuity Planning

Business Continuity Plans should be reviewed to ensure disaster recovery and continuity arrangements remain adequate. Any actions generated should be addressed promptly.

Refer to the Aviva Loss Prevention Standard **Business Continuity Management** for further guidance.

## Checklist

A generic **Compacting and Baling Processes** Checklist is presented in Appendix 1 which can be tailored to your own organisation.

## Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners.

For more information please visit: [Aviva Risk Management Solutions - Specialist Partners](#)

## Sources and Useful Links

- [The Dangerous Substances and Explosive Atmospheres Regulations 2002.](#)
- [The Regulatory Reform \(Fire Safety\) Order 2005.](#)
- [The Fire Safety \(Scotland\) Regulations 2006.](#)
- [The Fire \(Scotland\) Act 2005.](#)
- [The Fire and Rescue Services \(Northern Ireland\) Order 2006.](#)
- [LPS 1208: LPCB fire resistance requirements for elements of construction used to provide compartmentation](#)
- [LPS 1271: Requirements for the LPCB Approval and Listing of Companies Installing Fire or Security Doors, Door-sets, Shutters and Active Smoke/Fire Barriers.](#)
- [LPS 1197: Requirements for the LPCB approval and listing of companies inspecting, repairing, and maintaining fire and security doors, door-sets, shutters, and active smoke/fire barriers.](#)

**Note:** Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

## Additional Information

Relevant Aviva Loss Prevention Standards include:

- **Arson Prevention**
- **Housekeeping - Fire Prevention**
- **Smoking and the Workplace**
- **Material Damage Risk Assessment**
- **Lithium-ion Batteries - Storage and Transit**
- **Fire Compartmentation**
- **Fire Doors, Fire Shutters and Fire Dampers**
- **Self-Inspections**
- **Heat and Smoke Venting Systems**
- **Electrical Installations - Inspection and Testing**
- **Electrical Lighting - Property**
- **Hot Work Operations**
- **Maintenance Regimes**
- **Managing Change - Property**
- **Self-Inspections**
- **Property and Business Impact Risk Assessment**
- **Electrical Installations - Inspection and Testing**
- **Business Continuity**

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

**Email us at [riskadvice@aviva.com](mailto:riskadvice@aviva.com) or 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.

# Appendix 1 - Compacting and Baling Processes Checklist

Location	
Date	
Completed by (name and signature)	

	Management Programmes	Y/N	Comments
1.	<ul style="list-style-type: none"> <li>Have risk assessments been completed for all compacting/baling locations?</li> <li>Have any and all actions to reduce the risks been addressed?</li> <li>Are these reviewed regularly?</li> </ul>		
2.	<ul style="list-style-type: none"> <li>Are proposed compacting/baling equipment installations to be managed through a formal Management of Change process?</li> <li>Have any proposed changes been discussed with your Property Insurer and Insurance Broker.</li> </ul>		
3.	Is appropriate training provided for workers and other personnel associated with compacting/baling operations?		
4.	Is there a formal Emergency Response Plan in relation to compacting/baling equipment		
5.	<ul style="list-style-type: none"> <li>Is a Business Continuity Plan in place?</li> <li>Is this routinely reviewed?</li> </ul>		
6.	Are adequate written self-inspections completed and all actions completed		
7.	Is compacting/baling equipment subject to a formalised service/maintenance arrangement with a reputable company?		
8.	<ul style="list-style-type: none"> <li>Are formal electrical inspection, testing and maintenance regimes in place for all electrical items in the compacting/baling and storage locations?</li> <li>Are thermographic cameras used to look for unusual heat patterns?</li> </ul>		

	Management Programmes Cont'd	Y/N	Comments
9.	<ul style="list-style-type: none"> <li>Where permitted, are hot works undertaken within buildings should be conducted in strict accordance with the Aviva Loss Prevention standard <b>Hot Work Operations</b>?</li> <li>Are thermographic cameras used throughout the process and during the required fire watches.</li> <li>Are fire watches undertaken for up to 240 minutes after the hot works and only reduced where supported by a specific risk assessment.</li> </ul>		

	Compacting and/or Baling Equipment	Y/N	Comments
10.	Is the equipment sourced from a reputable manufacturer with a proven track record?		
11.	<ul style="list-style-type: none"> <li>Are installers experienced and reputable?</li> <li>Are electrical works undertaken in compliance with national/local regulations, standards or codes.</li> </ul>		
12.	Is the banding used compatible and recommended by the supplier?		
13.	Are safety guards and interlocks installed and functional?		
14.	Are emergency stop buttons easily accessible?		
15.	<ul style="list-style-type: none"> <li>Does the equipment have hydraulic pressure relief valves fitted?</li> <li>If so, will the fluid be adequately contained?</li> </ul>		
16.	Is metal/foreign object detection interlocked and operational?		
17.	Is obstruction detection interlocked and operational?		
	Are all safety features and interlocks checked at the start of each shift?		
18.	<ul style="list-style-type: none"> <li>Is compacting and baling equipment operated whilst unattended?</li> <li>If so, has this been prohibited and adopted into standard operating procedures?</li> </ul>		
19.	Is there a formal service/maintenance arrangement in place with a reputable company?		

	<b>Compartmentation</b>	<b>Y/N</b>	<b>Comments</b>
20.	Is smaller compacting/baling equipment located in a separate fire compartment or demarked area at least 3m from storage and other equipment, processes?		
21.	Are large items of compacting/baling equipment located in a detached, dedicated building or 90-min fire-rated compartment?		
22.	<ul style="list-style-type: none"> <li>Is external equipment suitably rated for outdoor use</li> <li>Is any such equipment located at least 10m from buildings or valuable assets?</li> </ul>		

	<b>Housekeeping</b>	<b>Y/N</b>	<b>Comments</b>
23.	Is the location cleaned throughout the day and at the end of each shift?		
24.	Is deep cleaning scheduled based on a risk assessment?		
25.	Is waste removed to external stores at the end of each shift?		
26.	Are smoking areas located at least 10m from storage?		

	<b>Storage of Materials</b>	<b>Y/N</b>	<b>Comments</b>
27.	Is at least 3 metres separation maintained between stocks of material and compacting/baling equipment?		
28.	Are storage apportioned into 'blocks' limited to 50m <sup>2</sup> or less in compacting/baling locations?		
29.	Is storage height of stock kept below 1.8m in compacting/baling locations??		
30.	Is processed stock removed from the compactor/baler location regularly and maintained to a minimum?		
31.	Is processed and unprocessed stock stored at least 10m from buildings or valuable assets when stored externally?		

	Storage of Materials Cont'd	Y/N	Comments
32.	<ul style="list-style-type: none"> <li>• Is polystyrene processed?</li> <li>• If so, is it stored in trailers or sheds at least 10m from buildings/assets.</li> <li>• If stored in the open is this also at least 10m from buildings/assets and covered with fire-retardant sheeting?</li> <li>• Are warning signs displayed at storage areas?</li> <li>• Is lighting in storage buildings low voltage and suitably maintained?</li> <li>• Is polystyrene in the area limited to one pallet at a time?</li> <li>• Is metal detection installed and interlocked to power supply?</li> <li>• Are hot works prohibited unless all polystyrene stocks are removed?</li> <li>• Are manual trucks used for moving polystyrene in and around buildings once compacted?</li> </ul>		

	Fire Detection and Protection	Y/N	Comments
33.	<ul style="list-style-type: none"> <li>• Is there a comprehensive automatic fire detection (AFD) system connected to a constantly attended location or Alarm Receiving Centre?</li> <li>• Are all compacting/baling and stock storage areas adequately covered by the AFD system?</li> </ul>		
34.	<ul style="list-style-type: none"> <li>• Are automatically closing fire doors, shutters, dampers, etc. actuated by automatic fire detection?</li> <li>• Are these regularly tested?</li> </ul>		
35.	Has automatic sprinkler protection, installed and managed to recognised standards been considered?		
36.	Additional Comments:		

## **Please Note**

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