

Paint Curing Operations - Property

Many trades and organisations undertake paint related operations that require curing to harden or set finishes.

This Loss Prevention Standard describes the main risks associated with paint curing processes and provides guidance on reducing the potential for loss or damage.

Paint Curing Operations - Property

Introduction

Many paint activities require curing to harden or set the finish. The curing process also stabilises the coating to help protect against water, corrosion and in some cases, chemical damage.

Depending on the paint or finish being applied, curing can be:

Air Cure. The finish sets via a process of oxidation as solvents within the paint evaporate. This process does not typically require any specialised curing equipment, however, usually requires a clean air environment to prevent deposition and contamination of the painted surface as the solvents evaporate.

Chemical Cure. Such as two-pack and reactive coatings, such as epoxies and polyurethanes. These work by mixing two components, which chemically react and result in a durable finish with good resistance to chemical and corrosive conditions. They do, however, require careful mixing and quality control.

Heat Cure. Finished items are warmed or baked, typically in specialised static or travelling 'ovens', resulting in a highly durable and consistent finish. The nature of the 'oven' is a function of the curing temperature required.

Other less common, or specialised curing processes include **moisture cure**, where paint finishes react with moisture in the air to cure, and **ultraviolet (UV) curing** where light triggers the curing process. These are outside the scope of this document.

This document discusses the main risks associated with paint-related air, chemical and heat curing processes and provides guidance on managing those risks.

Note: This Loss Prevention Standard relates to paint and finish curing 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 paint-curing operations, that cause frequent loss events:

- **Flammable Vapours.** Solvents used in some paint finishes emit flammable vapours that are heavier than air. These can accumulate in confined or poorly ventilated spaces or spread to other areas or drainage systems creating potentially flammable and explosive atmospheres.

- **Extraction.** Inadequate, faulty, or damaged local exhaust ventilation (extraction) systems may not effectively remove flammable vapours at the required rate, with damaged equipment potentially producing sparks with the associated ignition hazards.
- **Combustible Material Deposition.** With any curing or drying activity, the emitted solvent vapours will, over time, be deposited within the curing environment or oven and any associated extraction ducting. These deposits are combustible and as such need to be carefully cleaned to reduce the fire exposure and continuity of combustible material.
- **Containment and Segregation.** Paints, solvents, and associated materials may be inadvertently stored within curing or drying areas creating a fire and explosion exposure, particularly when stored in proximity to hot equipment or surfaces.
- **Equipment Faults.** Curing ovens can overheat or develop faults including gas leaks, overpressure, flame failure and breakdown of electrical components. Safety devices can fail and the equipment can be used incorrectly, creating a heightened risk of fire and explosion.

The potential for fire propagation can be aided by:

Fire Load. Combustible or flammable material in proximity that could support fire growth, e.g., paint stock, packaging, combustible construction materials within buildings, etc. This includes any polyethylene clean enclosures or tunnels created to protect objects from dust deposition. The thickness of the polyethylene is critical in understanding the fuel load.

Fire Compartmentation. Penetrations and inadequate or defective fire compartments and firestopping can allow fire to spread through the property.

Fire Detection and Protection. Lack of, or inappropriately / incorrectly installed fire detection, protection and associated safety interlocks to curing oven fuel or power supplies or ventilation systems can result in uncontrolled fire development.

Management Programmes

Risk Assessment

Fire and /or explosion risk assessments, should be completed in accordance with local or national regulations, standards or codes. Any corrective actions should be implemented promptly.

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

Material Damage Risk Assessment

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

This helps ensure that management programmes, 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

Any proposed changes to business activities, equipment and the premises for risk management purposes should be managed through a formal Management of Change process. This helps ensure all stages of any change are progressed with minimal exposure to the existing arrangements. This is especially important for high hazard activities such as paint-related processes, handling and storage.

- Any proposed changes should also be discussed with your Property Insurer, Insurance Broker, and any authority having jurisdiction.

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

Hot Works

Hot works are tasks or equipment that use or create heat, flame or sparks. Examples include, but are not limited to welding equipment, blowtorches, grinders, drilling and brazing.

- Hot works should be prohibited and the work removed to a safe location, or if this is not possible, only be undertaken via 'cold' methods.
- Where this is not possible, the hot works should be conducted in strict accordance with the Aviva Loss Prevention standard **Hot Work Operations**.

Managing the Risks

Painted items will need to dry, and this is typically undertaken by placing items in a drying room or area.

Ensure drying or curing locations are:

- Planned, designed, installed and maintained in accordance with the relevant risk assessments and any relevant OEM guidance.
 - ✓ Ensure suitable ventilation is provided following appropriate risk assessment(s).
- Dedicated solely for curing/drying purposes.
 - ✓ No other activities should be undertaken.
- Kept clear of other combustible or flammable materials.
- Utilise heating / heaters suitable for use in the location, following appropriate risk assessment(s).
 - ✓ Any such heaters should be adequately fixed/secured to avoid being damaged, moved, etc.
 - ✓ Portable heaters are not suited for use and should be removed along with any associated fuel supplies.

Where any curing equipment is utilised, ensure that:

- Fuel isolation valves are accessible and located remotely from the oven plant, ideally on an escape route.
- Fuel pipes are protected against the risks of impact or accidental damage and clearly identified and not located in immediate proximity to curing equipment.
- Fuel-fired curing equipment incorporates flame failure safety interlocks.
- Electrically powered ovens should feature temperature failsafe devices to ensure safe isolation in the event of a thermostat/thermocouple fault.
 - ✓ Two such devices are normally recommended.
- Where flammable coatings are utilised, ensure curing equipment is provided with effective mechanical ventilation to prevent the accumulation of flammable vapours.
- Airflow should be continuously maintained to keep vapour concentrations below 25% of the Lower Explosive Limit (LEL).

- Interlocks should ensure the oven cannot operate without adequate airflow.
- Exhaust ductwork should be designed to prevent vapour stagnation and condensation of flammable deposits.
- Ovens should be adequately insulated to prevent surfaces becoming hot.
- Incorporate non-combustible, insulated extraction ducting.
 - ✓ Extraction flues should be double skinned, insulated, and provide fire resistance equivalent to that of the wall or ceiling where they pass through a compartment.
 - ✓ Ducting should only pass through non-combustible walling, ceilings, etc. Where this is not achievable, remove the combustible material to provide at least 300 mm clearance around the ducting and replace it with non-combustible materials.
 - Spray foam insulation materials are rarely non-combustible and should not be used.
- Any ducting for air handling/ventilation purposes through compartment walls or ceilings should be fitted with fire dampers to provide a commensurate fire resistance rating as the wall/ceiling.
- Operatives should be adequately trained on emergency isolation procedures.

Note: Fire dampers are not typically recommended for oven extraction systems. Guidance should be sought from a competent fire engineer or other expert.

Self-Inspection

Regular self-inspections of the curing/drying room or area, and any areas in immediate proximity, should be completed by responsible persons to ensure compliance with rules and standards. This should also consider combustible materials or objects in the curing area and the deposition of combustible deposits on any exposed surfaces (including the building and curing area) and within any extract ducting.

The frequency of inspections will vary depending on the nature of the premises and curing/drying activities undertaken, however, at least daily checks and weekly, thorough formal inspections should be undertaken.

The Aviva Loss Prevention Standard **Self-Inspection** provides useful guidance in this regard.

Maintenance

Ensure appropriate Planned Preventative Maintenance (PPM) programmes are in place for curing/drying environments and associated equipment based on Original Equipment Manufacturer (OEM) instructions and industry best practice.

- Ensure gas-fired equipment is inspected, tested and maintained in accordance with any national regulations, standards or codes.
- All safety features, including any power interlocks, should be regularly tested, calibrated and checked to ensure normal operation.
- Ventilation and extraction systems should be maintained in line with any regulatory requirements.

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

Emergency Response

An emergency response plan should be produced, specifically developed to outline key responsibilities and actions in an emergency event involving paint curing/drying processes. The emergency response plan should include responses to all likely property and business interruption risks including fire, explosion, breakdown and escape of water and other fluid related exposures.

The emergency response procedures should be formally documented, and appropriate training provided.

Refer to the Aviva Loss Prevention Standard **Emergency Response Teams** for 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 for the business, and in particular for any paint curing operations. Any actions generated should be addressed promptly.

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

Automatic Detection, Fire Suppression and Associated Interlocks

The following should be considered as part of the overall risk management strategy for paint curing/drying activities:

- Automatic fire detection.
- Automatic fire suppression such as automatic sprinkler or deluge protection.
 - ✓ Protection should be extended into the ventilation exhaust plenums and ducting using an appropriate arrangement to prevent the protection from being contaminated by paint droplets etc.

Interlocks should be provided between the above and any curing ovens or drying equipment/heaters, e.g., fire alarm activation or system isolation (impairment).

In addition, interlocks should be provided to safely shut down curing ovens or drying equipment/heaters if there is a fire or similar emergency event in another area of the premises.

Finally, any interlock and shutdown strategy for paint curing should also consider the paint spraying or dipping activities prior to curing and any operations post curing.

Note: Consult your Property Insurer, Broker and any authority having jurisdiction for further guidance relating to detection, protection and interlocks associated with paint related activities.

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.

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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: [Aviva Risk Management Solutions – Specialist Partners](#)

Ireland

[Pass Thermal Imaging Cameras and PAT Testing Equipment – Aviva Ireland](#)

United Kingdom

Thermal Imaging Cameras and PAT Testing Equipment – [Pass](#)

Standards, Sources and Useful Links

Canada

- Gas-fired equipment may be subject to applicable gas safety legislation and regulations, and all work should be completed by a suitably qualified and licensed gas technician or contractor. Refer to the relevant provincial or territorial gas safety authority for further guidance on gas safety.

Ireland

- Gas-fired equipment may be subject to applicable Irish gas safety legislation and regulations, and all work should be completed by a **Registered Gas Installer (RGI)**. Refer to the [Commission for Regulation of Utilities \(CRU\)](#) for further guidance on gas safety.

United Kingdom

- Some premises and gas fired oven equipment may be subject to the requirements of the Gas Safety (Installation and Use) Regulations (GSIUR), and all work should be completed by a Gas Safe registered person or company. Refer to the [Health and Safety Executive](#) for further guidance on gas safety.

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:

- **Paint Spraying Operations**
- **Paint Mixing Operations**
- **Housekeeping**
- **Self-Inspections**
- **Maintenance Regimes**
- **Use of Thermographic Cameras - General Considerations**
- **Emergency Response Teams**
- **Business Continuity - Seven Steps to Continuity**
- **Material Damage Risk Assessment**
- **Business Impact Analysis**
- **Managing Change**
- **Electrical Installations - Inspection and Testing**

Please visit [Loss Prevention Standards](#) to view the full library.

Aviva Risks Training Solutions

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.

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22nd September 2026

Version 1.0

ARMSGI4142026

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