



**Specific SHE Standard
Safe Handling of HPC
Aerosols Products in the
Supply Chain**

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Approved by
Responsible
Next Review

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Safe handling and storage of HPC aerosol products

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Specific SHE Standard
Safe handling and storage of HPC aerosols products

Contents

1. INTRODUCTION.....	4
2. APPROVAL OF THIRD PARTY COMPANIES	5
3. GENERAL HEALTH & SAFETY REQUIREMENTS	5
4. SPECIFIC AEROSOL SAFETY REQUIREMENTS	8
4.1 General Minimum requirements for facilities storing aerosols	8
4.2 Additional requirements for facilities storing more than 40 pallets of aerosols	10
4.2.1 Additional requirements for facilities storing in excess of €10 million (Unilever cost only) of Unilever stock	11
4.2.2. Additional requirements for High Bay facilities storing over €10 million of Unilever stock.....	13
4.3 Picking and Marshalling Activities.....	14
4.4 Hauliers.....	15
4.5 Contract Operations	16

Safe handling and storage of HPC aerosol products

1. Introduction

Unilever is, amongst other things, engaged in the business of manufacturing personal care and home care products. These include aerosol products. Aerosol products contain an extremely flammable liquid (LPG) as the propellant. Some also contain a highly flammable liquid product base. Unilever has a solid safety performance record with regard to its aerosol products. However, these products do present a potential fire and explosion hazard within the extended HPC Supply Chain. For example, within the following operations:

- Warehousing
- Picking and marshalling in the production of mixed pallets
- Transport by road, rail and sea
- Hub operations involving the trans-shipping of pallets and handling of parcels
- Contract operations for repacking, rework of products or production of promotional packs

It is clearly important that aerosol products are stored and handled in a safe manner so as to minimise the risk to personnel, assets (buildings, equipment, vehicles etc.) and from the business interruption that would follow a serious incident.

First and foremost, it is the obligation of all involved organisations to be cognisant of, and comply with, all applicable local legal requirements associated with their respective operations. This standard is not a substitute for compliance with local legal requirements. The purpose of this standard is to instruct organisations storing and handling aerosols on the minimum precautions they must take, in addition to local legal requirements, to eliminate, reduce and/or control the potential risks from aerosols products. To the extent that local legal requirements are more protective or if this standard conflicts with local legal requirements, the local legal requirement will control. Please note, this standard pertains to the storage and handling of aerosol products. A separate specific SHE standard has been published on the “Safe Manufacture of Aerosol Products”.

This standard is applicable to all Unilever organisations and third party companies who store and handle aerosol products within the extended HPC supply chain. To help in the implementation of this standard, a guidance document of suggested practices has been prepared called the “Guidance for the Safe Handling of Unilever Aerosols in the Supply Chain” (the so-called Purple Book). Additional requirements for risk control in storage locations can be found in the Unilever Insurance and Risk Control Policy.

Safe handling and storage of HPC aerosol products

2. Approval of Third Party Companies

The selection and use by Unilever of Third Party companies to store and handle aerosol products must be undertaken in full compliance with the Unilever Specific SHE Standard on “Unilever Third Party Manufacturing“ and the general and specific requirements of this standard.

3. General Health & Safety Requirements

All Unilever organisations that handle and store HPC aerosol products must operate in full compliance with the Unilever SHE Framework Standards.

Third Party companies who handle and store HPC aerosol must, as a minimum, comply with the general occupational health & safety requirements outlined in the table below:

Item	Mandatory Requirements
Occupational Health & Safety Policy	All organisations must have a documented occupational health and safety policy. <ul style="list-style-type: none"><li data-bbox="560 1178 1284 1249">• The most senior person within the organisation must sign the policy.<li data-bbox="560 1255 1328 1436">• The policy must have been communicated across the whole organisation to ensure that all individuals working for the organisation are aware of their individual and collective rights and responsibilities.
Organisation	Each organisation must define, document and communicate individual roles, responsibilities and authorities for the implementation, control and improvement of the occupational health and safety management system and provide adequate resources.
	Each organisation must establish access to a source of competent expert advice on occupational health, occupational safety and aerosol process safety matters.

Safe handling and storage of HPC aerosol products

Item	Mandatory Requirements
	<p>Companies must have a nominated competent person (either on site or immediately available to the site) who is formally trained in the transport of dangerous goods, and who can therefore advise on requirements when transporting aerosols.</p> <p>Distribution centres and Hub operators must employ a system whereby they can provide 24 hour user support to aerosol product transporters in respect of advice on safe handling of aerosol products.</p>
Risk Assessment	<p>Each organisation must have conducted a formal risk assessment to identify and assess the potential hazards arising from its operations, with potential to cause harm to personnel. This will include potential hazards presented by storage and handling of aerosol products. The risk assessment must be structured in such a way that it :</p> <ul style="list-style-type: none"> • takes into account previous operational experience plus the routine and non-routine activities of all individuals working for, and the facilities and equipment provided by, the organisation. • identifies suitable measures to eliminate or control effectively any identified significant occupational health and safety risks. • thoroughly analyses and addresses the hazards and risks associated with potential property damage (fires, earthquake, floods, etc) on-site as well as the consequential loss of profit as a consequence of the property damage. • for companies with more than 5 employees these risk assessments must be recorded in a formal, documented, format and then kept under periodic review.

Safe handling and storage of HPC aerosol products

Item	Mandatory Requirements
Operational Controls and Training	<p>Each operator must ensure that suitable procedures and controls are implemented, based on the findings of the risk assessment, to ensure that risk to personnel is minimised. This must include :</p> <ul style="list-style-type: none"> • documented procedures and/or work instructions to cover situations where their absence could lead to deviations from the requirements of their occupational health and safety policy. • a process with which to communicate relevant procedures and requirements to their suppliers and contractors. • appropriate training for employees, proportionate to their occupational health & safety responsibilities, abilities, literacy and the occupational health & safety risks associated with their work, including emergency preparedness. • retention of formal training records for individuals to validate that they have received and appreciated the training they have been given. • all employees must be given basic training on fire precautions, and specific hazards associated with the aerosol products they will handle
Approval	A senior Supply Chain manager must formally approve Third Party companies selected to work within the HPC Supply Chain.
Audit	Formal Aerosol Safety Audits must be undertaken either by an independent loss prevention specialist familiar with the hazards associated with aerosols, or by Unilever aerosol safety specialists, at least once every 3 years, or whenever there is a significant change in the nature of the operations being undertaken for Unilever. Any actions or recommendations raised during the audit process must be addressed by the third party company within the agreed time frame

Safe handling and storage of HPC aerosol products

4. Specific Aerosol Safety Requirements

The following tables summarise the mandatory control measures for handling and warehousing of aerosol products. These are a summary of requirements from the Purple Book and the Unilever Corporate Insurance & Risk Control Policy , specifically the Enabling Instructions on Risk Control - sections 30.20 and 30.30

4.1 General Minimum requirements for facilities storing aerosols.

Control Measure	Mandatory requirements
Handling of Pallets	Any automatic can handling systems must be systematically reviewed to identify potential causes of cans becoming damaged or crushed. Suitable measures to avoid can damage must be built into the design.
	The site sprinkler design may require that aerosol pallets stored on the ground not be stacked more than 1 high; but in no case shall aerosol pallets stored on the ground be stacked more than 2 high.
	Drive through racks must not be used for the storage of aerosols.
	Aisles between storage racks/piles must be wide enough to allow fork lifts to manoeuvre. No storage in aisles.
	A procedure for handling damaged / leaking cans must be prepared. It must be documented and operators must be trained in relation to it.
	Pallets containing aerosols must be checked for signs of damage or leaking cans before being taken into storage.
	Appropriate protocols must be in place to safely remove leaking / damaged cans to a safe, well ventilated location (preferably outdoors), remote from possible ignition sources.
	Fork lift truck drivers must be trained in relation to the hazards associated with aerosol products and on the procedures for safe handling of stock damaged in an accident.
Temperature of Storage	Cans must never be stored in environments where the temperature could exceed 50°C.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
	Cans must never be stored near heaters, hot pipes or directly beneath hot roofs
Fire Detection and Alarms	Means of detecting a fire and raising an alarm must be provided.
	Smoke detectors must be provided above battery charging facilities
Means of Escape	There must be good means of escape with clear, well marked, well lit escape routes. No dead ends in aisles.
	Emergency exit doors must be secure to prevent unauthorised access, but provide easy exit in case of an incident.
Manual Fire fighting facilities	Small fire fighting equipment (fire extinguishers and hose reels) must be provided in accordance with local codes / regulations or insurers; but at a density not less than at least 1 extinguisher every 200 m ² . This equipment must be inspected and maintained at least annually.
	The local fire authority must be familiar with the premises and the activities to ensure an effective intervention in the event of a fire on-site.
	A water supply for fighting fires (e.g. - hydrants, open water or water tanks) with adequate capacity must be available.
	Extinguishers must be clearly visible and in well marked locations. Personnel must have easy access to extinguishers.
Housekeeping	Combustible materials must be kept to a minimum in areas where aerosols are stored.
	There must be routine checks for accumulation of combustibles and immediate removal of any loose, fallen, rogue cans .
	Storage procedures must ensure that old or out of date stock is removed from the warehouse . Written procedures must be prepared detailing how to dispose of out of date stock.

Safe handling and storage of HPC aerosol products

Control of Ignition Sources	Each site must have a clear smoking policy, and it must be communicated to staff, visitors, and contractors on-site. Smoking must only be allowed in safe designated smoking areas.
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Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
Stock >1.5 m clear of lighting fittings?	No smoking in warehouses
	No naked flames in warehouses
	Battery charging facilities must be separated from all storage by at least 3 metres. No storage of product directly above charging facilities
	There must be a site specific formal risk assessment to determine protection requirements for fork lift trucks. Electric trucks with continuously sparking DC motors must not be used with aerosols
	There must be a permit to work system in place for hot work.
Emergency Plan	Site must have a formal emergency plan and train employees on the operation of that plan. The plan must be routinely reviewed and tested.

4.2 Additional requirements for facilities storing more than 40 pallets of aerosols

Control Measure	Mandatory requirements
Fire Detection and Alarms	Automatic fire detection must be installed in compliance with internationally accepted codes of practice.
	Alarms to be directed to an appropriate 24 hour manned service or gatehouse.
Building Construction (Applies to new construction and facilities that are "new use" for Unilever	Building construction must be non-combustible.

Safe handling and storage of HPC aerosol products

	Sandwich panels (where used) must be non combustible . Polystyrene and polyurethane composite panels must not be used.
Building Construction (Applies to existing facilities	If combustible materials (e.g. - polystyrene) are used as core materials in sandwich panels, the facings and joints of the panels must be maintained and in good repair to prevent exposure of the core material to ignition sources.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
	Exposed combustible insulation materials are not allowed.
Manual Fire fighting facilities	The site must have a suitable access road for emergency vehicles.
Security	Access to site must be via a security check point. There must be routine security patrols outside of operating hours if the site is not manned 24 hours..
	There must be a procedure to ensure no unauthorised access to warehouses.

4.2.1 Additional requirements for facilities storing in excess of €10 million (Unilever cost only) of Unilever stock

Control Measure	Mandatory requirements
Fixed Fire Protection	<p>New storage facilities (facilities that are new builds, facilities where major re-design and/or construction work is occurring, or facilities that are new for Unilever use must have in- rack and ceiling sprinklers with fast response heads and a wet pipe system conforming to NFPA 30B or F.M. Data Sheet 7-31 (whichever is most recent issue).</p> <p>This requirement does not conflict with the <u>Unilever Policy on Insurance and Risk Control</u>. This policy states (in the "Enabling Instructions on Risk Control " section 30.30) that for "normal storage" sprinklers are not required until the total financial risk (including stock, building, profit, business loss, etc..) is over €20 million. The storage of aerosols represents a "greater than normal" risk, and therefore the threshold for where sprinklers are required is set at €10 million of total Unilever stock at risk.</p>

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
	<p>For existing facilities in which the aerosol storage is not protected by an automatic sprinkler system complying to NFPA 30B, or FM 7-31, or an equivalent protection scheme</p> <p>;the stock must be segregated by 2-hour rated fire walls to limit the quantity at risk to not more than €10 million. These fire walls are defined as the fire-resistant separating wall including the connected roof and wall constructions. The total construction of the fire segregated compartment must be such that it will prevent the fire from spreading to an adjacent compartment for 2 hours.</p>
	<p>Sprinkler systems and other fire protection systems must be suitably maintained and tested.</p>
Segregation	<p>For new facilities (same definition as above) where the aerosol storage represents greater than 50% of the total storage capacity, or where the value of the total stock stored exceeds €10 million, the stock must be separated into fire segregated bays to minimise overall risk. Fire walls must have a minimum of 2 hour fire rating. These fire walls are defined as the fire-resistant separating wall including the connected roof and wall constructions. The total construction of the fire segregated compartment must be such that it will prevent the fire from spreading to an adjacent compartment for 2 hours.</p> <p>For existing facilities storing in excess of €10 million, this segregation is not required provided that the aerosols storage is protected by an automatic sprinkler system complying to NFPA 30B, or FM 7-31, or an equivalent scheme.</p>
	<p>There must be automatic fire doors at access / egress points, and automatic fire shutters on all openings between fire segregated compartments. These devices must have fire resistance ratings at least equal to the fire walls.</p>

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
Ventilation	There must be adequate ventilation / air movement to rapidly dilute / disperse leaks of propellant from aerosol products (this will normally be achieved through natural ventilation and air movement created by trucks and personnel – special facilities will only be required if air movement is unusually low)
	Battery charging areas must be adequately ventilated, where a segregated room is used there must be forced extract ventilation, the room walls must have a fire resistance of at least 1 hour.

4.2.2. Additional requirements for High Bay facilities storing over €10 million of Unilever stock

Control Measure	Mandatory requirements
Handling of pallets by High Bay cranes	Automatic cranes must have devices to identify pallet spaces are empty before placing pallets
	Automatic cranes must have at least two redundant positioning devices
	There must be a schedule for routine testing of accuracy of crane detection devices.
Compartments for High Bay storage	For new facilities with double deep storage racking, each rack must have central solid divisions (e.g. sheet steel) in each rack running top to bottom and full length. (<i>this requirement does not apply to existing facilities</i>)
Cages for High Bay storage	For new facilities storage racking must have wire cages (in association with sprinklers) to act as totally enclosing "compartments" (with the exception of the front), sufficient for a maximum of 12 pallets in a cage. (<i>this requirement does not apply to existing facilities</i>) – for some sprinkler layouts horizontal plates will be required instead of horizontal meshing.

Safe handling and storage of HPC aerosol products

Ventilation for High Bay storage	Forced ventilation is required for new facilities.
	Where forced ventilation proves necessary it must be designed to ensure good air movement throughout the building in general, but most specifically at low level.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
	Where continuous extract ventilation is used the air flows must be continuously monitored by flow switches, configured to raise an alarm if the ventilation fails.
	Forced ventilation to be routinely validated by measurements
Gas Detection for automated High Bay storage	Automatic detection of leaks from pallets as they arrive onsite (e.g. checks with explosimeter when received), and of pallets in storage (e.g. attached to fork assemblies of cranes)
	Gas detectors must be configured to cut power to the crane if gas is detected. (but power to lights to be left on)
Control of Ignition Sources in new High Bay storage facilities	Electronics associated with forks on crane to be Ex rated to zone 2 standard. Footprint of racks, to a height 1 metre above the ground to be zone 2 and all electrical apparatus in this area must be certified to zone 2 standard.
	Buzz bars for automatic crane systems to be mounted at high level above zoned area

4.3 Picking and Marshalling Activities

The following table summarises the mandatory control measures for picking and marshalling activities involving aerosol products.

Control Measure	Mandatory requirement
Removal of leaking cans	Operators to be trained in how to identify leaking / damaged cans
	Appropriate protocols must be in place to safely remove leaking / damaged cans to a safe, well ventilated location (preferably outdoors), remote from possible ignition sources
Overloading of Cans on Pallets	Picking operators to be conversant with "pallet strength indicators" and to ensure that the order on picking lists is always adhered to.
	Routine checks to ensure pallet stability
	Pallets must be inspected for exposed nails or other sharp items / surfaces that could puncture an aerosol can.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirement
Parcel Packing	Checks to ensure correct packing materials used for parcels
	Operators must be trained on how to pack parcels correctly, e.g. using polystyrene fillers as necessary, and how to operate taping machines to ensure adequate closure integrity of the parcel.
Incompatible materials	Checks to confirm no incompatible products on a mixed pallet with aerosols, or in the same parcel.
Housekeeping	Minimise combustible materials – clear loose, fallen or rogue cans and prevent combustible debris accumulating beneath roller beds

4.4 Hauliers

The following table summarises the mandatory control measures for haulier operations involving aerosol products:

Control Measure	Mandatory requirements
Leaking cans	Packs found to contain leaking cans (or suspected of containing such cans) must not be reloaded onto a road truck for return to point of origin. The local Unilever logistics manager must be called for additional instructions. (Reference Purple Book section 7)
	Pallets of stock for return must be correctly packed in full compliance with appropriate Transport of Dangerous Goods requirements
Securing of loads	Trailers to be checked for loose aerosol cans and other extraneous debris, which must be cleared before loading
Fire protection	At least one fire extinguisher per road truck
	Formal training for drivers on emergency procedures
Expertise	Haulier to employ or have access to at least one person who is formally trained in relation to the local requirements of regulations for the transport of dangerous goods.
	Drivers transporting aerosols must be aware of the potential fire hazards of aerosols.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
	Haulier must retain at their head office at least one set of current transport of dangerous goods regulations for reference when required.

4.5 Contract Operations

The following table summarises the mandatory control measures for shrink wrapping and sleeving of aerosol products:

Control Measure	Mandatory requirements
Handling of Pallets	Pallets on the ground must not be stacked more than 2 high
	Aisles wide enough to allow fork lifts to manoeuvre
	Warehouse operators and fork lift drivers must be trained in the safe and appropriate action to take if cans are found leaking, or if a pallet is involved in an accident .
	Pallets containing aerosols to be checked for signs of damage or leaking cans before being taken into storage.
Temperature of Storage	Cans must never be stored in environments where the temperature could exceed 50°C.
	Cans must never be stored near heaters, hot pipes or directly beneath hot roofs
Means of Escape	Provision of good means of escape with clear, well marked, well lit escape routes.
Manual Fire fighting facilities	Fire extinguishers and/or water hose-reels to be provided in accordance with local codes / regulations
	Extinguishers/hose-reels to be clearly visible and in well marked locations
	At least one carbon dioxide fire extinguisher in close proximity to battery charging facilities
	Formal fire emergency plans to be developed and rehearsed.
Housekeeping	There must be immediate removal of any loose, fallen, rogue cans
	Minimise combustible materials where aerosols are stored.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
Control of Ignition Sources	Battery charging must be separated from designated aerosol storage by at least three metres. No storage of aerosols above charging facilities
	Hot work to be controlled by permit to work system.
	No smoking or naked flames in warehouses or packing areas
Sleeving and Shrinkwrapping, mechanical handling of cans	Devices for mechanical handling of cans must be systematically assessed to identify potential causes of can damage. Control measures to minimise this risk must be installed. Mechanical handling devices to be suitably guarded.
Sleeving and Shrinkwrapping, involving heating tunnels	Precautions must be taken to minimise the risk of cans falling over in the tunnel.
	The tunnel internals must be designed such that if cans fall over there is minimal risk of them getting trapped in the tunnel.
	Aerosols must not be shrink wrapped using direct flame heaters.
	Operators must check that the tunnel is clear of cans prior to any stoppage.
	Whether the machine is continuously manned or not, there must be suitable provisions to prevent cans entering a tunnel which is too hot.
	Carbon dioxide or dry powder extinguishers in close proximity to the heating tunnel
Sleeving and Shrinkwrapping, involving automated heating tunnels, using air recirculation or blowers (operators not continuously in attendance)	Automatic machines (i.e. those with no personnel in attendance at either end) must be fitted with detectors to identify: <ul style="list-style-type: none"> (i) fallen cans (ii) blockages (iii) no motion of the conveyor (iv) overheating of the tunnel and configured to automatically cut off heating if any of these arises.

Safe handling and storage of HPC aerosol products

Control Measure	Mandatory requirements
Sleeving and Shrinkwrapping, involving manual heating tunnels (operators continuously in attendance)	Emergency stop buttons must be strategically located around the tunnel, within easy reach of operators. These emergency stops must be configured to cut power to all parts of the tunnel. There must also be a facility to only cut power to the heaters, but not to stop the conveyor, to deal with a situation where aerosols may be trapped in the tunnel.
	Operator must have access to one end of the tunnel to be able to clear blockage or fallen cans, and must be trained on action to take if cans become trapped in the tunnel.
Sleeving and Shrinkwrapping using hot air blowers – manual operation (operators continuously in attendance)	Blowers / conveyor must be surrounded by guards
	Operators must be instructed to cut the heating if cans get stuck in the tunnel.
	Carbon dioxide or dry powder extinguishers in close proximity to the heating tunnel
	Emergency stop buttons must be strategically located around the machine, within easy reach of operators. These emergency stops must be configured to cut power to all parts of the machine. There must also be a facility to only cut power to the heaters, but not to stop the conveyor, to deal with a situation where aerosols may be trapped in the machine.
	Operator must have access to one end of the enclosure around the conveyor to be able to clear blockage or fallen cans, and must be trained on action to take if cans become trapped in the enclosure.

Safe handling and storage of HPC aerosol products

Sealer Bars	Shrink wrapping machines with automatic sealer bars must have sensors on the bars to detect an obstruction in the path of the bar and cause it to automatically retract.
	Shrink wrapping machines with manually operated sealer bars must require the operator to use both hands to activate lowering of the bar.
Rework/Repacking operations	Contract packer must conduct risk assessment and agree control measures with the Unilever Contract Manager.
	Pallets with packs containing aerosol products must always be stretch wrapped and never shrink wrapped.