ICHCA
INTERNATIONAL

SAFE CLEANING OF FREIGHT CONTAINERS

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Table of Contents

Warning

This document provides an introduction to safe cleaning of freight containers. For detailed advice it is necessary to read this in conjunction with the relevant national and international legislation and guidance.

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SAFE CLEANING OF FREIGHT CONTAINERS

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1. | INTRODUCTION

The internal and external cleanliness of freight containers is important for the avoidance of unnecessary restrictions to their use and movement.

Containers may need to be cleaned for several reasons including but not limited to:

- quarantine control to prevent exportation of pests and diseases
- maintenance of food quality containers
- avoidance of cross taint between consecutive loads
- removal of nails and other items that can damage cargo packaging
- removal of cargo residue

The cleaning operation must always be undertaken in a safe and controlled manner, irrespective of the reason for cleaning. This publication considers the requirements for the safe cleaning of general purpose, insulated and refrigerated (reefer) containers. The specialised requirements for tank containers are not covered.

2. | RESIDUES

Under the terms of a Bill of Lading for a full container load (FCL), it is normally the consignee's/receiver's responsibility to ensure that a container is returned to the carrier/container operator in a clean condition. This duty is frequently overlooked and containers are often returned with cargo residue and securing material remaining inside.

Before any container cleaning operation is undertaken any cargo residue should be precisely identified.

The International Maritime Dangerous Goods (IMDG) Code stipulates that for most dangerous goods hazard placards should be affixed to the exterior of the side and end walls of a freight container to provide a warning that the contents are dangerous goods and present a hazard. This includes a warning sign if the cargo is moving whilst under fumigation. Placards/signage should not be removed until the dangerous goods and their residues have been totally removed from within the container. If hazard placards/signs are removed on discharge of the cargo, but prior to the removal of any residue, the next person(s) entering the container can be unknowingly exposed to a substance that could be hazardous to their health.

It is a matter of record that dangerous goods are sometimes inadvertently or wilfully mis-declared. An example of this was a shipment of expandable polymeric beads (UN No. 2211, Class 9) that had not been declared as hazardous, but nevertheless evolved sufficient propane gas to create an explosive atmosphere and the death of two individuals who were attempting to unpack the freight container.

The air tightness of insulated and reefer containers, and even some general freight containers, can result in the build-up of a hazardous internal atmosphere. The atmosphere could be toxic, oxygen deficient or even explosive. The atmosphere within a container should be checked to

ensure that it is safe to enter. Container terminals and others who might need to access containers should:

- conduct a suitable and sufficient risk assessment
- put into place a safe system of work which will adequately control reasonably foreseeable risks

before allowing access to the freight container. The principle of the hierarchy of controls should be applied whereby the first, best option is to eliminate the risk where practicable. The least reliable control - personal protective equipment – being deployed in addition to other controls and when other controls are not practicable. Controls will typically include but not be limited to checking of the atmosphere by a competent person and safe ventilation of the container. Consideration should be given to the number of people required for the operation (typically more than one) taking into account the potential need to raise the alarm in the event of an incident. The safe system of work should include information, instruction and training appropriate to the task and potential risk(s).

The safe system of work should account for the fact that a container with no hazard placards/signs *may still be unsafe to enter*. Undeclared dangerous goods may have been shipped in the container. Hazard placards/signs may:

- have been prematurely removed
- never have been affixed
- not have been required in the first place

There are attendant risks whenever the doors of a container are opened, irrespective of whether the container is loaded or empty. Risks include but are not limited to cargo falling out and/or the container doors swinging open abruptly and injuring anyone standing in the vicinity. To minimise such risks, a restraining strap should be looped around the locking bars of the two doors prior to opening so that any immediate movement of the doors will be restricted if cargo starts to fall out of the container.

When a container is swept out while mounted on a trailer, cargo residue should not be allowed to fall onto the trailer. In one incident, although the container had been swept out, the residue of a class 6.1 toxic powder covered the rear end of the trailer. Shortly afterwards the residue was handled by a mechanic maintaining the trailer who became seriously ill after swallowing some of the toxic powder, having not adequately cleaned his hands before a meal break.

Even if not directly handled, swept cargo residue can become airborne and might be inhaled by persons standing near the trailer as the particles of residue are blown off. Such incidents have resulted in hauliers being prosecuted and fined for having dangerous goods residues adhering to the outside of their vehicles.

The frequent imbalance in import and export container movements means that large quantities of empty units are moved around the world. It may, therefore, be some considerable time before a container is re-used. Consequently, if a container has not been

cleaned on discharge and cargo residue is present, it may be found a long way from where the cargo itself was delivered.

Uncertainty about whether a container might contain residue or not has resulted in some container operators issuing advice to sub-contractors regarding the caution that should always be exercised when entering a container (see example at Appendix 1).

Some container operators affix a label to the inside of the container doors to highlight various points to shippers and receivers. For an example of such a label see Appendix 2. Such advice and labels do not alter the responsibilities of container operators and others such as shippers, packers, cleaners etc.

3. | IDENTIFICATION OF RESIDUES

Irrespective of whether there is particular national legislation, all those responsible for detailing persons to enter freight containers where unidentified substances may be encountered should have a recognised procedure for the reporting and handling of unidentified substances.

Such procedures for persons entering containers should include, but may not be limited to:

- provision of information, instruction and training, including awareness of the potential hazards associated with the commodities and any associated packaging thought to be in the container
- a procedural check for residual unidentified substances
- actions in the event of discovery of unidentified substances including:
    - evacuation of personnel from the container and vicinity
    - placing the container out of bounds until the substance can be identified and action taken to ensure that it is safe to proceed
- means of reporting discovery of unidentified substances which is known to all those who might be affected (including sub-contractors, and third parties)
- emergency response planning and training in the event that a person is overcome inside a container, including:
    - access controls
    - summoning first aid and emergency personnel
- no smoking or use of ignition sources permitted in the vicinity of a container that is being opened

The procedure should include a system for verifying the previous contents of containers and their potential hazards. This may require checking of the records of cargo carried in relevant preceding movements as well as the immediate past cargo. The last cargo may have been loaded into an already dirty container.

Unidentified residues/substances may be from a non-hazardous cargo or a non-hazardous substance applied to protect cargo (e.g. talcum powder on bales of rubber). However, *unless*

the residue can be reliably identified it should be treated as hazardous until proven otherwise. The residue could be:

- something that was not knowingly carried
- undeclared or mis-declared hazardous cargo
- from an unknown cargo carried by a haulier

If any doubt exists about the identification of a cargo residue or any unknown substance inside a container a sample should be taken for analysis. The taking of samples should be done in a controlled manner under a safe system of work, by an authorised and competent person.

4. | CLEANING OPERATIONS

Once the residue in a container is identified, the container operator should appoint an appropriate cleaning services provider, with experience and facilities for the proper cleaning and disposal of the residue.

Before any cleaning operation is undertaken the following aspects should be considered:

- are there means of cleaning that do not involve putting the cleaning operative into a hazard zone (hierarchy of controls)
- health & safety data for the residue itself, and of any cleaning agent to be applied and the observance of any advised precautions
- some substances can be absorbed through the skin and mucous membranes
- any hazards (e.g. toxic, flammable, corrosive) associated with the cleaning agent, including when being used in a confined area
- potential reaction in combination with the residue in the container
- potential for the residue and/or cleaning agent to enter storm water or other drains and the need for any containment measures
- requirements for the proper disposal of the residue and/or the cleaning agent, for example, at an authorised site
- provision of any appropriate Personal Protective Equipment (PPE) such as respiratory protective equipment, protective clothing, head, hand and footwear

The cleaning operation for every container should be appropriately documented and records made available a needed. The duty holder should be able to provide evidence that they exercised due care and diligence for the health of persons engaged in the cleaning operation and or others who could be affected.

5. | IICL/ICS “GENERAL GUIDE TO CONTAINER CLEANING”

The Institute of International Container Lessors (IICL) and the International Chamber of Shipping (ICS) have developed a “General Guide for Container Cleaning”. The Guide is intended to be an adjunct to the existing IICL-5 “Guide for Container Equipment Inspections”.

The Guide covers the cleaning of general-purpose freight containers only. Open top, flat rack, refrigerated, insulated and tank containers are not covered. The aim of the Guide is to set a standard of cleanliness necessary for the carriage of most cargoes carried in general purpose freight containers and forms the basis for interchange agreements (on & off hire inspections). The Guide aims to reduce the environmental effects of cleaning agents and the range of certain components, e.g. hardwoods.

The Guide does not consider in detail the various safety issues relating to the cleaning of containers. However, the Guide is very explicit regarding the action to be taken when faced with residues that may be hazardous to health and advises that any unknown substances must be considered as hazardous until shown to be otherwise.

6. | CLEANING METHODS

A container may require cleaning for a number of reasons including -

- Removal of signs and dangerous goods placards, etc.
- Removal of cargo residue solid and/or liquid, either hazardous or non- hazardous
- Infestation
- Odours and Taints
- Protruding Nails
- Dunnage & packaging material removal

To return a container to a satisfactory acceptable condition, one or more of the following cleaning methods may need to be used:

- Dry sweep out
- Vacuuming
- Spreading absorbent powder, then sweeping out/vacuuming
- Low pressure water wash, cold water, without specific cleaning agent
- Scraping, sanding disc or wire brush
- High pressure water wash:
  - Cold with or without specific cleaning agent
  - Hot with or without specific cleaning agent
- Steam cleaning with or without specific cleaning agent
- Solvent cleaning
- Fumigation

Each cleaning method has its own advantages and disadvantages that can only be considered in the light of the circumstances of each case.

Wherever practicable the cleaning agent used should be biodegradable.

Sweeping will disturb dry particles causing dust to rise, which could be inhaled. Whether a respirator will be sufficient or a self-contained breathing apparatus required will depend upon the degree of risk presented by inhaling the particular dust. If a respirator is used, it is

essential that it has the correct filters with the appropriate protection factor. Vacuuming is a preferable method of cleaning, as less free dust is generated into the atmosphere.

The heat generated during a hot water wash or steam cleaning can result in strong and irritating vapours being given off which could affect both personnel and/or the container, for example ammonium bicarbonate can cause respiratory problems and paint to peel.

Steam cleaning is undertaken with water temperatures of up to 150 degrees Celsius. If the operator is not suitably trained and protected for using a steam lance, improper use could result in severe scalding of the operator and/or other personnel in the vicinity.

The treatment of mould on the internal surface of a container may require the spray application of a fungicide. Before starting any such operation the duty holder should ensure that the operator is suitably protected if the fungicide is dangerous through skin contact and/or inhalation.

Where a safer alternate is not practicable solvents may need to be used. In such circumstances the duty holder should ensure that there are adequate controls in place such as, but not limited to ventilation and PPE. The safe system of work should protect against known risks associated with the solvent e.g. respiratory, ingestion and dermatological. Solvents may:

- cause drying out of the skin resulting in dermatitis
- give off fumes or vapours that are harmful to health

After use, rags impregnated with oil, paint or solvent residue should be disposed of in a controlled manner. For transportation by sea “oily rags” are classified as a Class 4.2. Spontaneously Combustible Substance, as they are liable to ignite spontaneously according to the oil content. They should not be left lying about as they could cause fire.

Industry preference is to remove protruding nails, etc. When nails cannot be removed without damaging the wooden component, i.e. floor, the IICL/ICS repair method for protruding nails advises that the head of the nail should be driven down until flush with the top surface of the wood and the point of the nail should be bent against the underside of the wood.

Flexitanks should not be carried in general freight containers where nails have been hammered flush into the floor as it has been found that, with the flexing of the container during transportation, the nails can work free resulting in the flexitank being punctured.

With drummed cargo, the weight of loaded drums acting upon the floor of a container has also been found sufficient to cause previously flush nail heads to protrude and puncture the drums.

It is the responsibility of container operators to ensure that all cleaning contractors are aware of the nature and properties of cleaning agents that might be used, and are aware of any restrictions that might be placed on their use internationally, and on the subsequent movement of containers.

Several countries have national regulatory requirements that relate to the type of cleaning agents that may or may not be used. For example, there are Federal Regulations in the USA that regulate the use of cleaning agents that can be applied to containers that are destined to carry food. These Regulations refer specifically to packaging and the phases of the food distribution chain, and therefore apply to the internal surfaces of freight containers. The Regulations require that when a material is not "generally recognised as safe" it has to be authorised for use if it will come in direct or incidental contact with a food product, or if there is a chance that the material will impart a toxic substance, cause off-colours or otherwise contaminate the food. This requirement covers cleaning and sanitising agents used to clean the interiors of vehicles and containers; they must be authorised for safe use.

7. | CONCLUSIONS

All incidents of cargo residue must be treated as being of the worst possibility, i.e. hazardous – toxic, flammable, corrosive, until proven otherwise.

All cleaning operations must be undertaken in a safe and controlled manner.

The cleaning operation for every container should be documented and auditable as part of ensuring due care and diligence.

APPENDIX 1 – CONTAINER CLEANING AND/OR REPAIRS

An example of advice issued by a container operator

CONTAINER CLEANING AND/OR REPAIRS

We wish to re-confirm to you the need for your operatives to be conscious of the fact that containers delivered to you for cleaning and/or repair may contain residue of cargo, some of which on rare occasions could be classified as hazardous or noxious.

We have no reason to believe that the current incidence of such containers is any different from that which has prevailed over many years past, and when we are aware that a container has carried special cargoes we will continue to advise you in accordance with our past practices and procedures.

There are, however, occasions when we have no immediate knowledge of previous cargoes carried, particularly when we are engaging leased containers, and we consider it sensible to remind you that caution should always be exercised when first entering a container.

If your operatives have any reason to query any residue substances with which they are unfamiliar and consider suspect we will be pleased if you would advise us immediately to allow us the opportunity to investigate and determine the substance, prior to operatives commencing work. The container should be place out of bounds until at last the substance is identified.

APPENDIX 2 – LABEL AFFIXED TO INSIDE OF CONTAINER DOORS

An example of the contents of an instructional label affixed to the inside of the container doors

Before loading the shipper must check the proper condition of the container. By accepting the container the shipper recognises its suitability for the loading of the cargo to be carried.

Furthermore, attention is drawn to the fact that the consignee is obliged to return the container after discharge, clean and suitable for the transport of every kind of cargo.

This applies especially when poisonous, dangerous, or obnoxious cargo has been transported.

All labels referring to cargo shall be removed once the container has been suitably cleaned and is free of residues.

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The Australian Standards for Food Quality Shipping Containers

International Maritime Organisation

International Maritime Dangerous Goods Code

About The Author

At the time that this document was originally published:

Jim Chubb, MNI, was a Master Mariner, whose sea-going career was mainly spent serving on either general cargo or container vessels. On coming ashore in 1978 he joined Associated Container Transport Services Ltd as a Marine Co-ordinator with responsibilities for stowage planning and shipboard container lashing systems.

In 1989 he was appointed Cargo Care Manager responsible for day-to-day cargo handling activities within Europe for Principals engaged in the container transportation of general perishable and dangerous goods. An important aspect of his work was the cleanliness of the containers.

Prior to joining the ICHCA International Safety Panel he undertook on their behalf a research study into “Semi-Automatic Twistlocks”. The Research Paper was published in January 1994 and looked to identify the various types currently available and the working practices involved in their use.

He was a Director with BMT Murray Fenton Ltd, a leading firm of London based Marine Consultants and Surveyors, and is using his specialist knowledge of the stowage and securing of containers to expand the range of services offered by the Company.

International Cargo Handling Coordination Association

Established in 1952, ICHCA International is an independent, not-for-profit organisation dedicated to improving the safety, productivity and efficiency of cargo handling and movement worldwide. ICHCA’s privileged NGO status enables it to represent its members, and the cargo handling industry at large, in front of national and international agencies and regulatory bodies, while its Technical Panel provides best practice advice and develops publications on a wide range of practical cargo handling issues. Operating through a series of national and regional chapters, including ICHCA Australia, ICHCA Japan and Correspondence

and Working Groups, ICHCA provides a focal point for informing, educating, lobbying and networking to improve knowledge and best practice across the cargo handling chain.

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