

Reduced Risk Of Pallet Racking collapse

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Technical Rack design experience since 1985

Certified by SEMA (UK) as Rack Safety Inspector



Safety Case
Symposium 2018
Singapore

Reduced Risk Of Pallet Racking collapse

Which Industry uses the APR

Manufacturing

Woodworking

Oil & Gas

Broadcasting

Medical

Defense

**Steel Adjustable
Pallet Racking**



Aerospace

Motor Industry

E-commerce

Electronic

logistic

Chemical

SAFE USE OF STEEL ADJUSTABLE PALLET RACKING

“RACK SAFETY IS NEVER AN OPTION”

Reduced Risk Of Pallet Racking collapse

Aims & Objectives

Our aims are to:

- Establish and publish technical standards for all types of storage equipment.
- Represent the Storage Equipment Industry in discussions with UK Government departments and Local Authorities. SEMA is a Member of the British Materials Handling Federation (BMHF) and actively influences the Federation European De La Manutention (FEM Section), the European Handling Industries Federation which seeks to establish **common policies**, particularly technical, amongst national storage equipment associations.
- Maintain, above all else, the integrity of the Association.



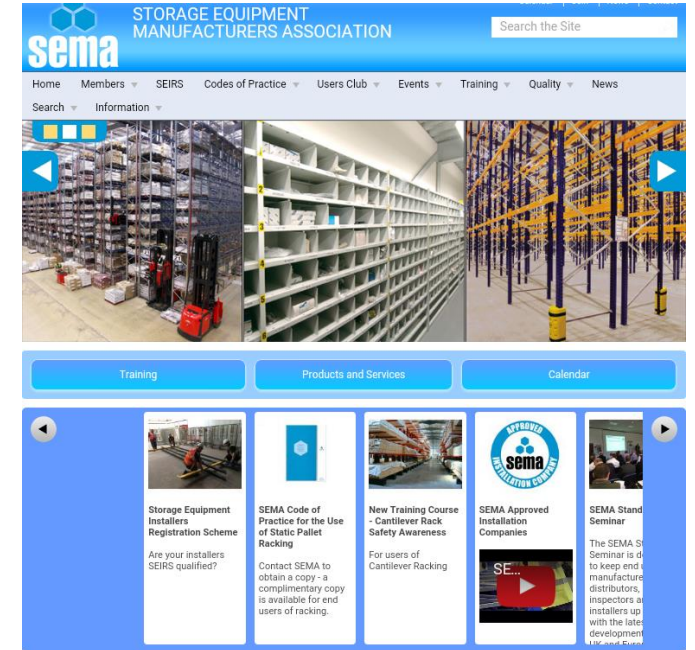
ANSI - Approved American National Standards



AS 4840 (2012)
Australian Standards

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WHO IS SEMA



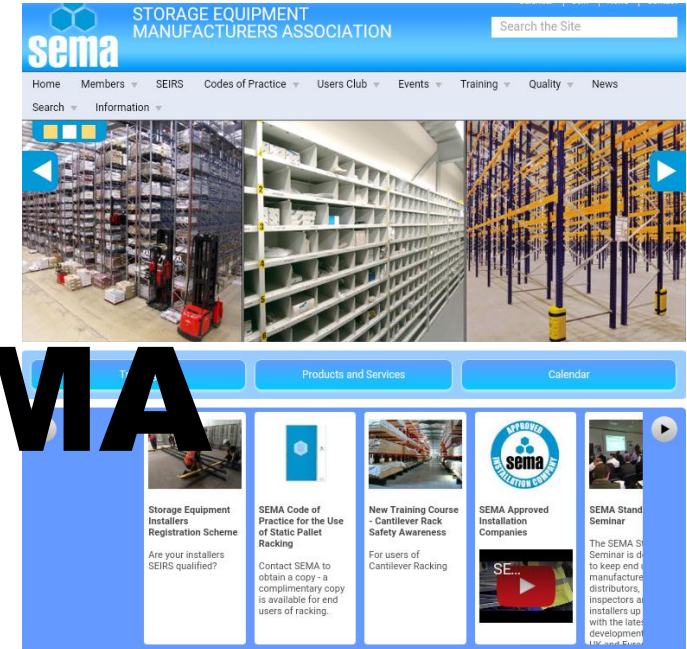
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CODE OF PRACTICES & DOCUMENT REFERENCE

SEMA (UK)

- CODE OF PRACTICE FOR THE USE OF STATIC PALLET RACKING
- GUIDE TO CONDUCT OF PALLET RACKING & SHELVING SURVEY
- LOAD NOTICES CODE OF PRACTICE FOR THE USE OF STATIC PALLET RACKING
- TERMS & DESCRIPTION OF STORAGE EQUIPMENT

FEM 10.2.03

- GUIDE FOR THE SAFE USE OF STATIC STEEL RACKING & SHELVING

FEM 10.2.04

- GUIDE FOR SPECIFIER'S OF STATIC STEEL RACKING & SHELVING - SPECIFIERS CODE

EN15620

- EUROPEAN STANDARDS - STEEL STATIC STORAGE SYSTEM ADJUSTABLE PALLET RACKING (TOLERANCE , DEFORMATION & CLEARANCES

EN15635

- EUROPEAN STANDARDS - STEEL STATIC STORAGE SYSTEM APPLICATION & MAINTENANCE OF STORAGE EQUIPMENT

EN15629

- EUROPEAN STANDARDS - STEEL STATIC STORAGE SYSTEM SPECIFICATION OF STORAGE EQUIPMENT

HSG 76 (UK)

- HEALTH & SAFETY GUIDE (UNITED KINGDOM)

Reduced Risk Of Pallet Racking collapse



PALLET RACKING

Please be mindful that all test and Structural calculation is based on a **PERFECTLY & NEW** racks,

1. undamaged
2. without any deformities
3. With no consideration of the **how long** the racks has been used
4. **NO CRASH** test
5. The **deficiency** of installation of racks

Rack has been designed , tested and installed as prescribed by Manufacturers Specification (conform to selected COP)

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Racks installed to required Manufacturer's Specificationand this happens



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3/20/2018



Reduced Risk Of Pallet Racking collapse



\$240k fine for steel rack collapse death

Rebecca Gredley / February 2nd, 2018

A contracting company has been fined \$240,000 over an incident in which a corroded steel storage rack collapsed at a Sydney worksite causing a worker to fall to his death.

Broadspectrum Australia had pleaded guilty and was fined in the NSW District Court on Friday over the 2015 incident in Botany that killed John Yoon.

There were no witnesses to the incident but it's understood Mr Yoon was retrieving a steel pipe from the storage rack when it collapsed. He was later found on the ground with a head injury.

Judge William Kearns said it was clear the storage rack could collapse because it was rusty and in a highly corrosive atmosphere.



"Prior to the collapse no steps had been taken to address the corroded condition of the rack," he said. "The foreseeable consequences of the rack collapsing included serious, even fatal, injury." Broadspectrum was also ordered to pay SafeWork NSW's prosecution costs of \$51,000.

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Reduced Risk Of Pallet Racking collapse

Trapped man rescued after being buried by tins and energy drinks in racking collapse

05 November 2017

The 54-year-old forklift truck driver was buried under a mountain of milkshakes, milk and energy drinks and other tins, cans and packets. A worker at a Black Country warehouse was trapped under tins and energy drinks for FOUR hours after a storage rack collapsed.

Firefighters were called to the Central Supplies warehouse in Saltbrook Road, Cradley, on Thursday afternoon.

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LUCKY

Reduced Risk Of Pallet Racking collapse

Newspaper Report

Man dies after being trapped by metal racks

A 65-YEAR-OLD man died at a fruit storage facility yesterday morning after being pinned under metal racks that had apparently fallen on him.

Singapore Civil Defence Force (SCDF) officers arrived at the building in Pandan Loop near Clementi to find him trapped under two 4m-high metal racks that were stacked on top of each other.

Each rack contained about 70 crates of fruit. The officers had to manually remove the crates before moving the racks with the help of two forklifts.



4m

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Like 13%
Sad 53%
Shocked 20%
Angry 13%

Man dies after being trapped by metal racks in Pandan Loop

Singapore Civil Defence Force (SCDF) was alerted to an incident involving a man trapped under metal racks at a fruit storage facility in Pandan Loop. When the man had no pulse when they arrived, SCDF said in a statement today. A red rhino, an ambulance and two support vehicles were dispatched to 230A Pandan Loop after the incident. The man, in his 60s, was pinned under two large metal racks, one on top of another. The racks, which were 4m wide and 4m tall, contained about 70 crates of fruit each, SCDF said. The officers had to manually remove the crates before lifting the metal racks with the help of two forklifts. As a precaution when lifting the racks, to prevent adjacent racks from toppling as well, SCDF said in a statement. The man died by the paramedics, and the case has been handed over to police.

Reduced Risk Of Pallet Racking collapse



07/05/2015



FACTORIES WITH WAREHOUSE STORAGE

Occupiers and employers engaged in warehouse and storage operations are reminded to take all reasonably practicable measures to ensure that the storage racks at your workplace are safe for use.

WSH Circular: Safe Use of Storage Racks

FACTORIES WITH WAREHOUSE STORAGE

Several deaths have occurred in warehouses over the last 2 years due to the collapse of storage racks. One of the common findings is that the storage racks were not properly designed for the intended storage loads.

In 2014, a stack of 2 racks storing fruit crates suddenly gave way and collapsed onto deceased worker, killing him instantly. This year, another death occurred when a stack of 3 storage racks collapsed and pinned the deceased under the stored sacks of sugar.

Occupiers and employers engaged in warehouse and storage operations are reminded to take all reasonably practicable measures to ensure that the storage racks at your workplace are safe for use.

You may refer to Annex A for guidance on some of the relevant WSH requirements. The Ministry of Manpower will be stepping up inspections and enforcement actions will be taken against any errant occupiers and employers.

Yours faithfully,

GO HENG HUAT
Deputy Commissioner for Workplace Safety and Health

Useful Info

What to do next

Step 1. Check your existing storage racks to ensure that they are designed for the intended storage load and have been properly installed.

Step 2. Perform a risk assessment on the use of storage racks.

Step 3. Establish a maintenance regime for the storage racks.

MOM is stepping up inspections. Possible enforcement actions include Stop Work Orders, Remedial Orders, Prosecution and Composition fines.

Resources for safe warehousing operations can be found on WSH Council's website <http://www.wshc.sg/>

Under the Workplace Safety & Health Act, companies that fail to take reasonably practicable measures to ensure the safety and health of their workers and any person in the workplace can be fined up to \$500,000 for a first offence.

Ministry of Manpower Services Centre
100 Cecil Street, Singapore 069531

<http://www.mom.gov.sg> enquiries@mom.gov.sg www.wshc.sg

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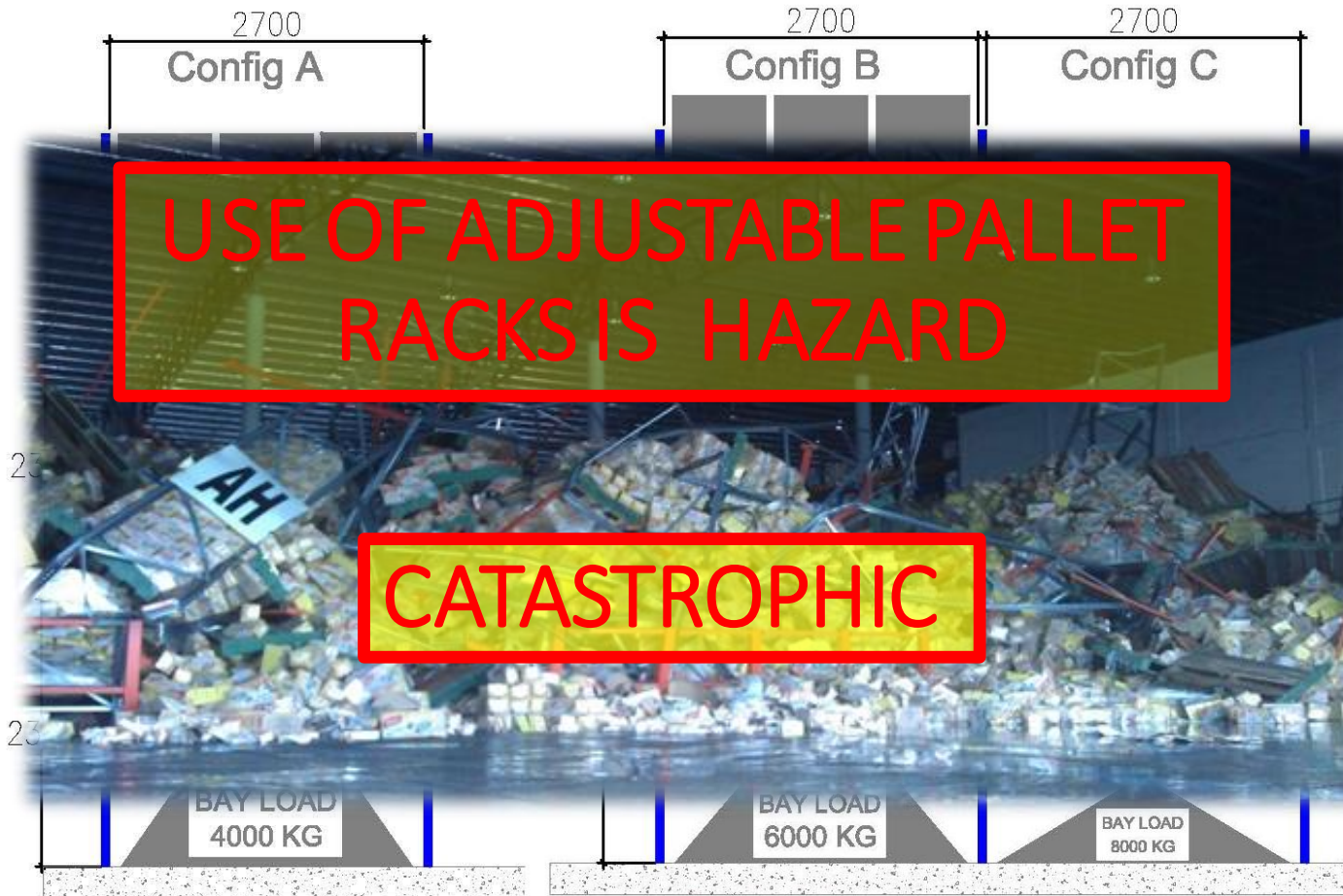
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BACK MESH

MESH DECKING

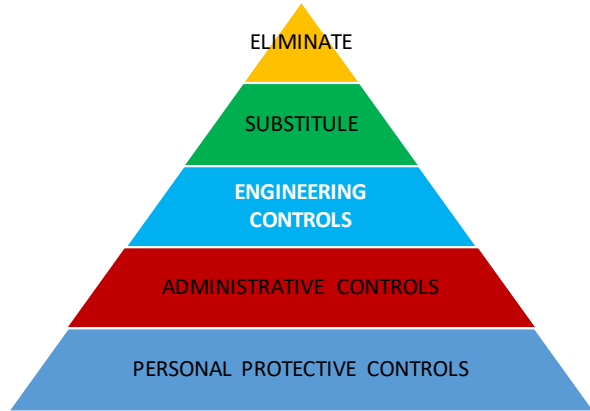
UPRIGHT PROTECTOR

LOAD NOTICES

Annual Rack Safety Inspection

- To be conducted by Certified Rack Safety Inspectors
- Inspection to be in accordance to prescribed COP
- Experienced in Storage Equipment is required
- Professional Liability Insurance

END PROTECTORS



RACK SAFETY AWARENESS TRAINING

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Annex A - Relevant WSH Requirements for Safe Use of Storage Racks

The following is a non-comprehensive list of relevant WSH requirements.

1) Design Consideration

The design of storage racks must allow for safe use and maintenance. The following should be considered in the design of storage racks:

- Storage racks must be structurally stable and designed with the intended use in mind (e.g. weight, volume, shape, dimensions, environment to be used in etc.).
- The safe working load of the storage racks should be prominently displayed. In particular, if the storage racks are stacked, the lower racks must be designed to take into account of the weight of the upper racks and their corresponding goods.
- There should be safe means of access to the goods being stored, including proper work-at-heights measures.
- The physical environment where the storage racks are to be used should be considered. For example, racks that are placed in areas where there is vehicular moment (e.g. forklifts, reach trucks etc) should be designed to withstand impact from possible collisions. In a cold room environment, temperature swings may require special considerations for corrosion protection due to moisture and other effects on the structural integrity of storage racks.
- A re-assessment of the storage rack's design should be carried before any change of use, including a change in the nature of goods to be stored.

2) Use of Storage Racks

The following measures are to be taken when using storage racks:

- Use of storage racks should be carried out in accordance with the manufacturer's instructions.
- Conduct a risk assessment for the use of the storage racks.
- Establish safe work procedures for work activities involving storage racks. The procedures should include confirming that the combined weight of the intended goods to be stored does not exceed the safe working load of the racks. In particular, if the racks are stacked, the bottom racks must have sufficient loading capacity to hold the racks and goods stored above.
- Ensure that warehouse personnel made aware of the safe working loads and are trained on the safe work procedures for stacking and/or storage of goods.

3) Maintenance of Storage Racks

The following measures are to be taken when maintaining storage racks:

- Maintenance of the storage racks should be carried out in accordance with the manufacturer's instruction.
- Storage racks and accompanying accessories (including pallets) should be regularly inspected to ensure their structural integrity (for example, no signs of damage or corrosion). Any defective part must be repaired or replaced before use.

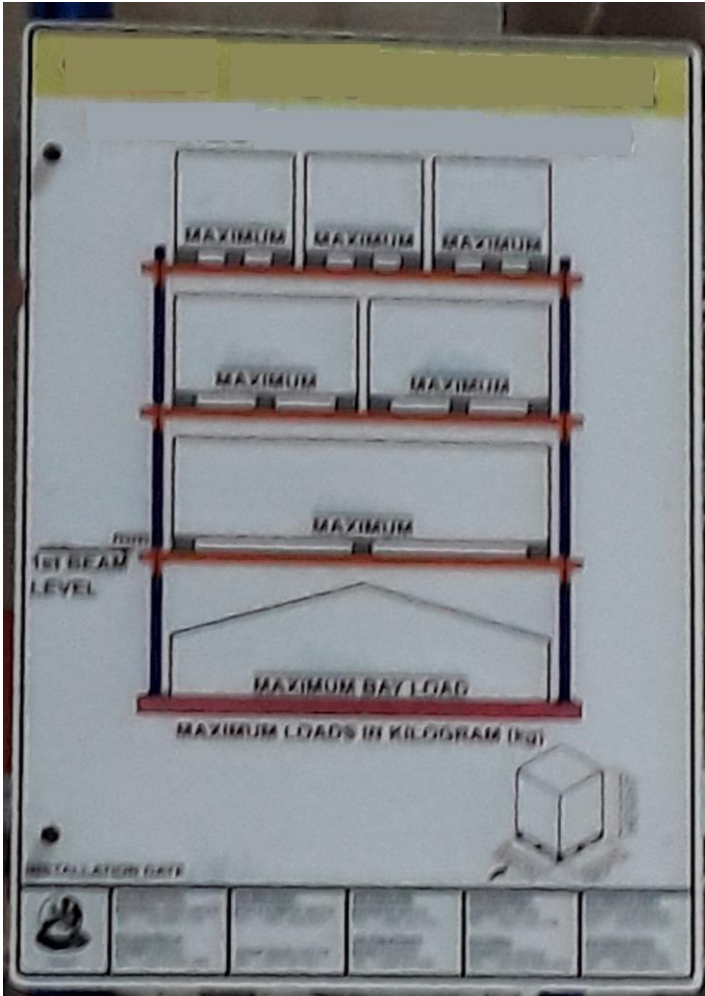
Annex A - Relevant WSH Requirements for Safe Use of Storage Racks

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BLANK LOAD SIGNS

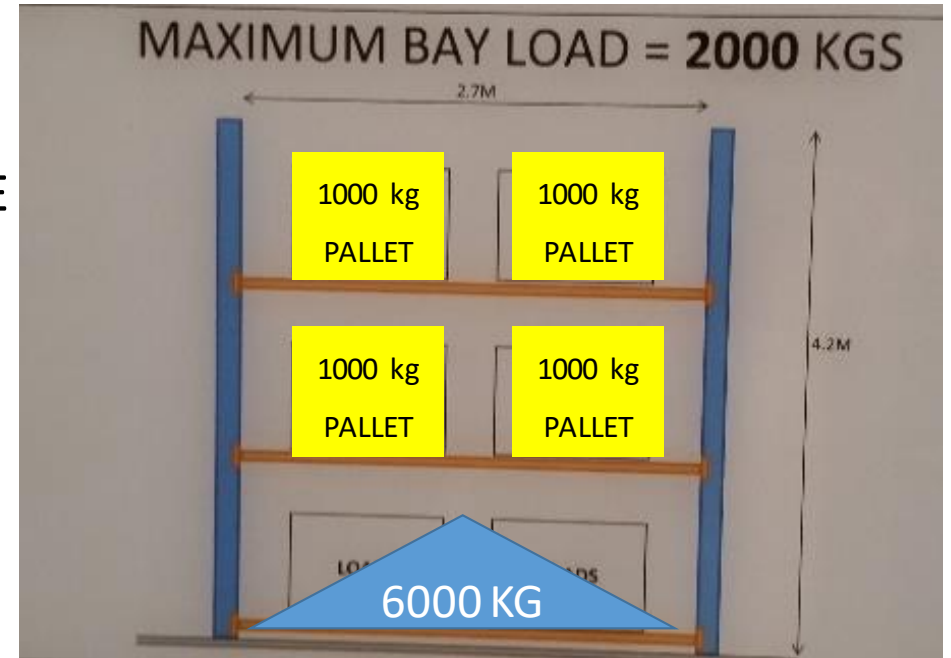
VENDORS GIVES CLIENT TO WRITE
THE LOADING OF THE RACKING

INACCURATE LOAD SIGNS

Pallet Loading 1000 kg each
Pallet per level x 2 pallets

Total load /level 2000 kg
Level per bay 3 levels

Total bay load 6000 kg



***The Load Sign should depict the rack configuration
, loading per level and loading capacity***

Reduced Risk Of Pallet Racking collapse



RED RISK
1.Immediate off load all affected bays of racking
2.Repair / replace the damage racking components



Reduced Risk Of Pallet Racking collapse



Vertical Upright
installed in wrong
direction
Result beams easily
dislodge not to
manufacturer's
specification

Dislodged Beam with safety pin

RED RISK

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2. Repair / replace the damage racking components

Questions

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SAFE USE OF STEEL ADJUSTABLE PALLET RACKING is to provide a safe workplace in warehouse / logistic operation .Minimizing possibility of racking from catastrophic collapse

mok@racksafety.sg

THANK YOU



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www.SafetyCaseSymposium.com