

Rack and stacking structures - subsection 7(7)

When is a PSR required?

When materials, articles or things are to be placed or stored on a structure that is a rack or stacking structure (item 3 in the section 7 table) a pre-start health and safety review is required unless the rack or stacking structure is designed and tested for use in accordance with current applicable standards.

For the purpose of section 7, "rack and stacking structures" include:

- industrial pallet racks
- moveable shelf racks
- stacker racks
- drive-in and drive-through racks, and
- cantilever racks.

They are made of cold-formed, hot-rolled steel, wood, aluminum or concrete structural members.

Rack and stacking structures exemption

If no pre-start health and safety review is required because subsection 7(7) of the regulation applies, the owner, lessee or employer shall keep documents establishing the exemption readily accessible in the workplace for as long as the rack or stacking structure remains in the workplace.

If no pre-start health and safety review is required due to the rack and stacking structures exemption, the documentation supporting the exemption must be readily accessible in the workplace per subsection 7(10) of the regulation.

What documents are acceptable to establish an exemption?

A document from the manufacturer, supplier or vendor of the rack or stacking structure that indicates the requirements for its safe use, and containing a statement outlining the loading conditions and design standards used to design and build the rack or stacking structure. The requirements can take the form of, but are not limited to, capacity tables, capacity charts, structural drawings or a written statement specifying the capacity. The document must bear the seal and signature of a professional engineer; or

A notice in writing from the manufacturer declaring that the rack or stacking structure is designed and tested for use in accordance with current applicable standards.

A recommended practice would be to have a professional engineer sign off on the exemption.

Rack and stacking structure provisions and standards

The provisions and circumstances listed in the section 7 table of [Industrial Establishments Regulation](#) act as a trigger to determine when a PSR is required for racking and stacking structures. There is one standard that can be used for an exemption from a PSR or to support compliance with a PSR, and other standards and codes to determine compliance with the applicable racking and stacking structures section of Industrial Establishments Regulation. These standards and codes are discussed below.

An exemption from doing a PSR may be claimed if the rack or stacking structure has been manufactured to meet the following Racking Manufacturing Institute Standard: Specification for the Design Testing and Utilization of Industrial Steel Storage Racks, Part 1, 2, 3. This standard deals with detailed safety requirements for a particular piece of equipment such as racks and stacking structures.

If the rack or stacking structure was not manufactured to this standard, the standard may be used by the engineer doing the PSR to demonstrate that the rack or stacking structure is in compliance with the applicable clause of the Industrial Establishments Regulation [clause 45(b)].

The codes and standards listed below cannot be used for exemption purposes but may be used by an engineer doing a PSR to determine compliance or measures to be taken to achieve compliance.

- Steel storage racking AS 4084-1993
- SEMA Code of Practice for the Design of Static Racking
- Pallet racks JIS Z 0620 - 1998

Is there an accredited organization that certifies racks?

No. However, if an exemption is invoked under subsection 7(7), the employer must request the documentation from the supplier or the manufacturer to substantiate that the rack is designed, manufactured, and installed in accordance with the listed specifications and instructions.

Does a shelf similar to a bookshelf for the purpose of storing small nuts and bolts require a PSR or exemption?

No. A PSR is not required for a portable rack as described above.

I am purchasing a 72-inch high and 18-inch deep hand-loaded metal shelving system for my maintenance shop that will be used for storing spare parts, do I need a PSR?

No. Section 7 is for intended for "rack and stacking structures" that are typified by tall structures containing loads that are placed onto the structure with lift trucks. Typical examples of these structures are; drive-in racks, cantilever racks, push-back racks, and selective racks.

Note that many other types of racks or stacking structures may be within the scope of section 7. The employer is responsible for determining if the design of the rack or stacking structure is within the scope of section 7.

If a firm purchases a drive-in rack and a cantilever rack system, will it be exempt from the PSR requirement if the manufacturer provides documentation stating that it is "designed and tested for use with the current applicable RMI standard?"

No, it would not be exempt because the RMI standard does not speak to these types of racks. In addition, the current applicable standard (Specification for the Design Testing and Utilization of Industrial Steel Storage Racks—ANSI MH16.1) specifically states that these types of racks are outside of its scope.

An employer may still be able to get an exemption from carrying out a PSR if the manufacturer of the racking system provides specific documentation that bears the seal of a professional engineer stating that the racking system has been designed and built to the current applicable standards.

If rack components (e.g. beams and upright frames) are "designed and tested for use with current applicable standards," does a rack structure assembled using the components require a PSR?

Yes, a PSR would be required. However, an exemption may apply if documentation exists and can be provided that clearly states the structure is "designed and tested for use with current applicable standards."

The documentation for the structure must identify the members (components) contained within it and the engineering controls or measures required for their assembly into the rack structure.

The documentation must also include:

- a) a statement from the manufacturer stating the structure is "designed and tested for use in accordance with the Specification for the Design Testing and Utilization of Industrial Steel Storage Racks—ANSI MH16.1 or the Standard for the Design and Construction of Steel Storage Racks—CSAA344.2-05"; or
- b) an indication of the design standards used, the maximum loading conditions, the requirements for its safe use (i.e. anchorage, erection tolerances, etc.), and a seal of a professional engineer licensed in Ontario.

How does one establish a link between racks within a warehouse facility and the documentation (that establishes their subsection 7(7) exemption) that is on file?

Generally speaking, racks do not have markings that identify their manufacturer, and racks from several manufacturers may appear very similar but have different capacities. Nevertheless, these rack structures are required to:

- a) be in compliance with the regulation and
- b) have the required documentation that establishes compliance.

Users are required to use practices that can achieve these requirements or they will not be able to demonstrate compliance with the regulation. Being non-compliant results in the need for an engineering report that can verify compliance.

If a damaged component is replaced or repaired, is a PSR required?

A PSR is required when an employer installs a new racking system or modifies an existing racking system. A damaged rack may require a PSR if the racking system is significantly altered or its use changed. If the damage is repaired in-house, a professional engineer licensed in Ontario will need to provide written guidance for the repairs.

However, a PSR is not required if replacing or repairing a component does not modify the rack or stacking structure, provided the replacement/repaired component has the required capacity and it is designed and tested for use in accordance with the current applicable standard, or documentation from the manufacturer of the repaired component establishes the repair has sufficiently restored the capacity of the component.

If a rack structure is assembled using components from different manufacturers or suppliers, and the individual components have documentation indicating they are "designed and tested for use with current applicable standards", is the rack structure exempt?

Although the different manufacturers' components have been "designed and tested for use with current applicable standards," the fact that these components have been mismatched (i.e. components from one manufacturer plus components from another manufacturer) means that a PSR may be required.

If this assembly is considered a modification, the employer would be advised to conduct an evaluation to determine if a PSR is required.

Note that an evaluation is not a PSR but merely a way of determining whether a PSR is required.

When modification of a rack structure triggers a PSR, what is the PSR to examine (e.g. affected components, bay, row, facility)?

The process of determining whether a PSR is required also includes a determination of what is required to bring the rack structure back into compliance with the regulation. Once this is determined, the scope of a PSR can then be limited to addressing the modification that resulted in noncompliance.

Is a field review of the installation required to confirm the racks are installed in accordance with the current applicable standards?

Although a field review by the supplier is not mandatory, the rack structure is still required to be installed in accordance with the requirements.

The installation of a racking system should only be carried out by workers who have received adequate training and are familiar with rack assembly procedures. The installation must be in accordance with the manufacturer's instruction or under the instruction of a professional engineer licensed in Ontario.

Does a PSR need to review the a) loads (pallets) for suitability to interfacing with the racks and b) the stability of the loads stored on the pallets?

No, provided the PSR or documentation used to provide a subsection 7(7) exemption specifies the parameters and/or type of load the rack structure is designed to support. It is the responsibility of the employer to ensure the loads are stable and conform to the specified parameters.

Does the structural adequacy of the floor that supports the rack structure need to be reviewed by the PSR?

No, but it must be designed to safely support the racks as stipulated by other sections of the OHS Act and its regulations. The scope of a PSR can be limited to item 3 in the table of section 7, which is specific to racks and stacking structures with material, articles, or things placed on them.

Are rack storage systems with elevated floors (pick modules) subject to PSR, and does the review need to include items such as fall arrest?

The employer must review the other regulations under the OHS Act that apply such as fall protection, and take the necessary measures required to comply. In this case it should be noted the vendor or supplier of the rack storage system is still required to comply with other regulations such as building codes that deal with issues such as guarding of open edges.

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When doing the PSR, should the review document all damage that may adversely affect the capacity of the racking structure?

The requirements of a PSR are outlined in subsection 7(4). The review does not require components be inspected for damage and the effects of the damage assessed; however, the OHSA still requires the employer maintain the racks in good and safe condition.

If the contents stored within the racking units change, is a PSR required?

The purpose of clause 45(b) of the Industrial Establishments Regulation is structural. It is required that contents be stored so that they will not tip, collapse or fall.

If the new contents include those items listed in item 1 of the section 7 table (flammable liquids), then a PSR may be required.

If the load limits as stated by the manufacturer of the rack are exceeded, then a PSR will be required.