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Prevention guide: Manual material handling and customer service in warehouse superstores

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Prevention Guide |

MANUAL MATERIAL HANDLING AND CUSTOMER SERVICE IN WAREHOUSE SUPERSTORES

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RG-546



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**To consult
these documents,
click on the links
in blue**



- > 1 [checklist for identifying problems](#)
- > 6 solutions sheets: [Purchasing](#) [Layout](#) [Circulation](#) [Equipment](#) [Training](#) [Organization](#)
- > 1 [grid for evaluating solutions](#)
- > 1 [summary of references presented in the guide](#)

Foreword

The retail industry is one of Canada's largest job sectors. It is estimated that in the province of Québec, this industry employs over 400,000 workers.

Warehouse superstores constitute a rapidly growing retail sales sector.

Accident statistics and epidemiological studies show that workers in warehouse superstores are at risk, particularly with regard to handling-related back pain.

In Québec, the data of the Commission de la santé et de la sécurité du travail (CSST) (Québec workers' compensation board) helps target warehouse superstores as presenting a risk, particularly for back pain. When the retail sales subsector comprising warehouse superstores is isolated, it is observed that out of all the injuries compensated, the percentage of back injuries ranges from 39% to 50%, according to the sector, while this percentage is 27.9% in Québec as a whole. Moreover, two extensive epidemiological studies carried out in the retail sales sector, each involving over 31,000 handling personnel, show a strong relationship between manual material handling (quantity and intensity) and the development of back pain. These data are in addition to those from qualitative studies suggesting that employees in the retail sales sector, which includes warehouse superstores, suffer major stress symptoms.

For over ten years, warehouse superstores have been multiplying in most industrialized countries. While some studies suggest the existence of major risks in this sector of activity, few have focused on analyzing the work in this type of store. As a result, little is known about the working conditions that may explain both the musculoskeletal risks and the stress symptoms reported in the above-mentioned studies. However, such knowledge is essential for organizing prevention activities.

Two recent studies were carried out to better understand work in this sector, by analyzing risks and developing solutions in collaboration with industry partners.

An initial study focused exclusively on the handling activities of a group of stockers in a branch of a major warehouse superstore chain. A second study addressed the work of stockers, receivers and sales clerks in two stores of another chain well-established in Canada. The study focused on handling activities as well as customer service activities.

While these two studies do not provide an exhaustive description of all risk situations in the superstore sector, we felt that the knowledge developed allowed us to produce a practical prevention guide for those working in this environment.

The purpose of the guide is to present actors in this sector with a group of risk situations involving handling and customer service activities, and to show, for each situation presented, solutions that have been developed in the workplace. Our intent is to guide people who are interested in a more global prevention approach. We suggest that they set up a working group and, based on the situations presented in the guide, identify the risk situations existing in their own workplace. We then propose that they use the presented solutions to develop those that will be best suited to their company.

Offering many examples of risk situations and possible solutions, this guide can also serve as a basis for training activities to promote prevention in this type of store.

The first section situates the warehouse superstore sector and introduces the global prevention approach that we are proposing. The second section, the heart of the guide, presents risk situations and possible solutions, grouped into six categories. Sheets summarizing the main solution options, as well as a checklist to be used in the field to identify the risk situations particular to each company are provided. Also included is a follow-up sheet to evaluate the solutions developed.

We hope that this guide, the result of five years of research, will promote prevention activities and help improve worker health and production in the warehouse superstore sector.



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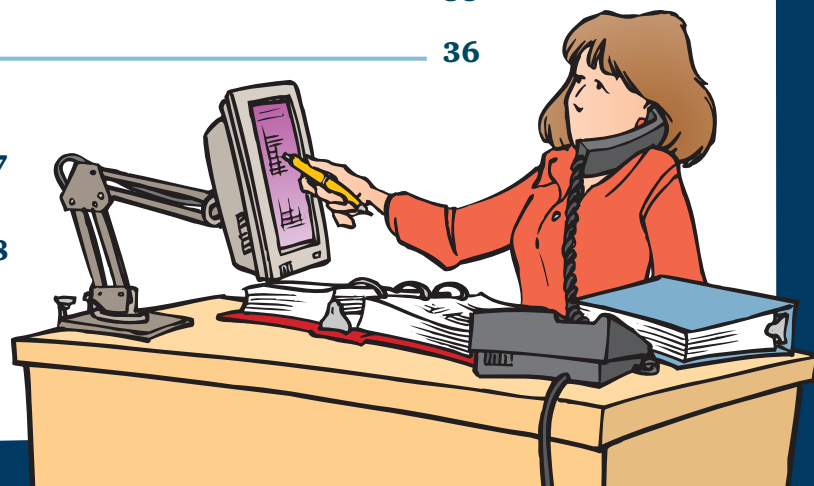
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Prevention Guide | HOW TO USE IT

What ?

This guide is the result of two extensive research projects carried out in the warehouse superstore sector¹. The problems identified as well as the solutions proposed stem from discussions with actors in this sector.

All the solutions are proposed for information purposes, in the form of examples. The goal is to provide you with viable solutions, as well as to promote dialogue on problems in order to help you find solutions adapted to your workplace.

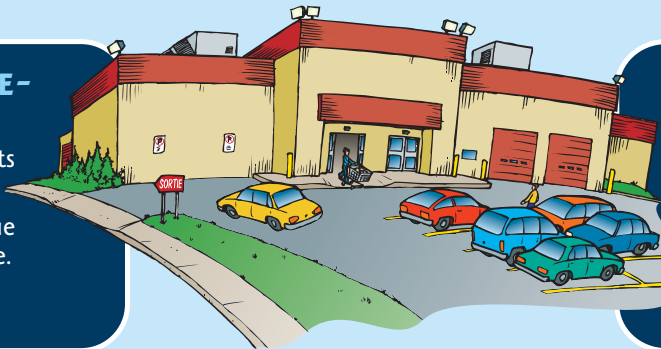
The main features of the warehouse superstores that were involved in developing this guide are summarized below. They are more or less present and prominent in every organization.

CORPORATE ORGANIZATION

- › Presence of an occupational health and safety coordinator in certain chains.
- › Existence of a distribution centre.
- › Presence of a head office. Certain operations are centralized.
- › Level of autonomy of branches (*corporate vs. individual franchises*).

MERCHANDISE-PRODUCTS

- › Wide variety of products
- › Large stock turnover due to limited storage space. Frequent arrivals.



WORKERS

- › Youth, students, little seniority, part-time.
- › High staff turnover.
- › Little training provided to new employees.

PHYSICAL LAYOUT

- › Little storage space. Most of the merchandise is stored on the sales floor and/or in small warehouses.
- › Frequent work at heights.

¹ The reports stemming from these two research projects can be downloaded free of charge from the IRSST's Web site:

› **Les principaux déterminants de l'activité de manutention dans un magasin-entrepôt de grande surface***

(Work factors affecting manual material handling in a warehouse superstore)

http://www.irsst.qc.ca/en/_publicationirsst_100041.html

› **Commerce de détail - Phase II : Analyse ergonomique approfondie dans trois magasins de grande surface***

(Retail sales - Phase II: Detailed ergonomic analysis in three superstores)

http://www.irsst.qc.ca/en/_projet_3148.html

You can also consult:

› **Guide de la CRAMIF "Les magasins de bricolage" *** (Do-it-yourself stores)

<http://www.cramif.fr/pdf/th2/prev/dtel25.pdf>

* Available in French only

Why ?

Accident statistics and epidemiological studies show that workers in warehouse superstores are at risk, particularly with regard to handling-related back pain and stress symptoms.

The purpose of this guide is to reduce the risks for workers and, at the same time, improve the organizational efficiency of the company.

For whom ?

This guide is aimed at all those who wish to practice prevention in this sector.

How ?

We would like to propose a five-step prevention process similar to a participatory ergonomic intervention, the key word being collaboration with the actors in this sector, particularly the workers. A tool is proposed for each of steps 2 to 5.

| | | |
|---------------|------------------------------------------------------------------------------------|----------------------------------------|
| STEP 1 | SET UP A WORKING GROUP | |
| STEP 2 | FAMILIARIZE YOURSELF WITH THE PROBLEMS AND SOLUTIONS PRESENTED IN THE GUIDE | ➔ 1 guide |
| STEP 3 | IDENTIFY THE PROBLEMS IN YOUR ORGANIZATION | ➔ 1 checklist for identifying problems |
| STEP 4 | SEEK SOLUTIONS | ➔ 6 solution sheets |
| STEP 5 | IMPLEMENT THE SOLUTIONS | ➔ 1 grid for evaluating solutions |

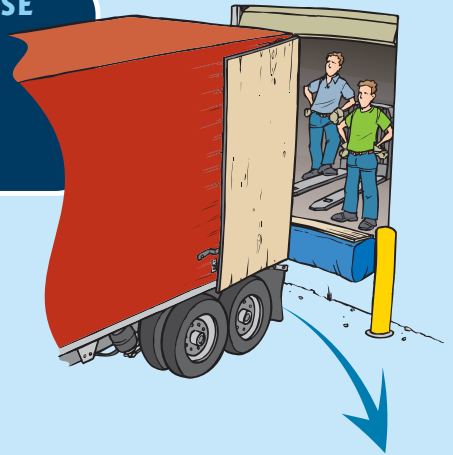
Movement of merchandise

From the time it arrives at the receiving dock until it is purchased by customers, merchandise moves according to a sequence through the different sectors of the store. The various steps of merchandise movement determine the work to be done.

ARRIVAL OF MERCHANDISE BY TRUCK

The receivers:

- › Receive the merchandise.
- › Verify the content of orders.



STOCK MANAGEMENT

The Purchasing Department:

- › Procures/orders new products.
- › Offers as many product varieties as can be stored in the available in-store space.



CUSTOMER SERVICE

The sales clerks:

- › Respond to customers and help them find what they are looking for.



BACK-STORE MERCHANDISE STORAGE

The receivers:

- › Organize the products by section so that they can be quickly identified when they must be taken to the store.



IN-STORE MERCHANDISE STORAGE

The lift truck operators and sales clerks:

- › Stock the products in the overheads.
- › Place the products in the in-store displays.



Prevention Process |

IN FIVE STEPS

STEP 1 | SET UP A WORKING GROUP

To monitor the entire prevention process, we suggest that you set up a working group. It should be made up of an occupational health and safety representative, two or three workers, a member of management and anyone else who may be interested in the project. It is recommended that there be no more than five to six people. The Health and Safety Committee, if it exists, could be mandated to implement this process.

For further information about working groups and how to run them effectively, you may consult the following documents:

> **Les groupes ERGO - Un outil pour prévenir les LATR*** (ERGO groups – A tool for WMSD prevention), pages 1 to 11
http://www.irsst.qc.ca/en/_publicationirsst_635.html

> **Work involving varied tasks: an ergonomic analysis process for MSD prevention, page 10**
http://www.irsst.qc.ca/en/_publicationirsst_100191.html

* Available in French only

STEP 2 | FAMILIARIZE YOURSELF WITH THE PROBLEMS AND SOLUTIONS PRESENTED IN THE GUIDE

This step involves familiarizing yourself with the main problems and possible solutions identified during the studies. The purpose is to guide you to the following step, which consists in identifying the problems specific to your workplace.

Two main themes are covered in this guide, namely, **manual material handling** and **customer service**, within which several subjects are developed. The following two sections are proposed for each subject:



What you should know

Description of the problem and its consequences for both the health of workers and the efficiency of the company.



Have you considered...

Possible solutions: a single solution will not solve the problem; rather, action must be taken on several factors.

The solutions presented are grouped into six categories:



Circulation of Information



Physical Layout



Interactions with Purchasing Department



Worker Training



Equipment



Work Organization

These main categories include three remarks:



Attention! This remark will alert you to the precautions to take.



This subcategory consists generally of solution examples, an interesting piece of equipment, an alternate way of doing things, a different physical layout, etc.



This subcategory presents more general suggestions.

Sometimes, to clarify a problem or introduce additional information, this section will be added:



This section presents two types of information:



Safety / standards Normative obligations or regulations regarding safety, mainly from Québec.



Useful documents Interesting references for the described problem.

In addition, you may consult the glossary on page 38.

STEP 3 | IDENTIFY THE PROBLEMS IN YOUR ORGANIZATION

Once you have familiarized yourself with the main types of problems that can exist in warehouse superstores, you will have to identify those present in your company.

To this end, we propose a tool entitled “Identify the problems” (*checklist*) to record your findings. One or more members of the working group should contact the workers to ask them to describe their problems. It would also be appropriate to go “on the floor” to observe the kinds of problems that exist. In short, all possible sources of information should be used.

The tool is a grid for identifying problems and/or difficulties. Certain problems presented may not exist in your company, while others that do exist may not be presented.

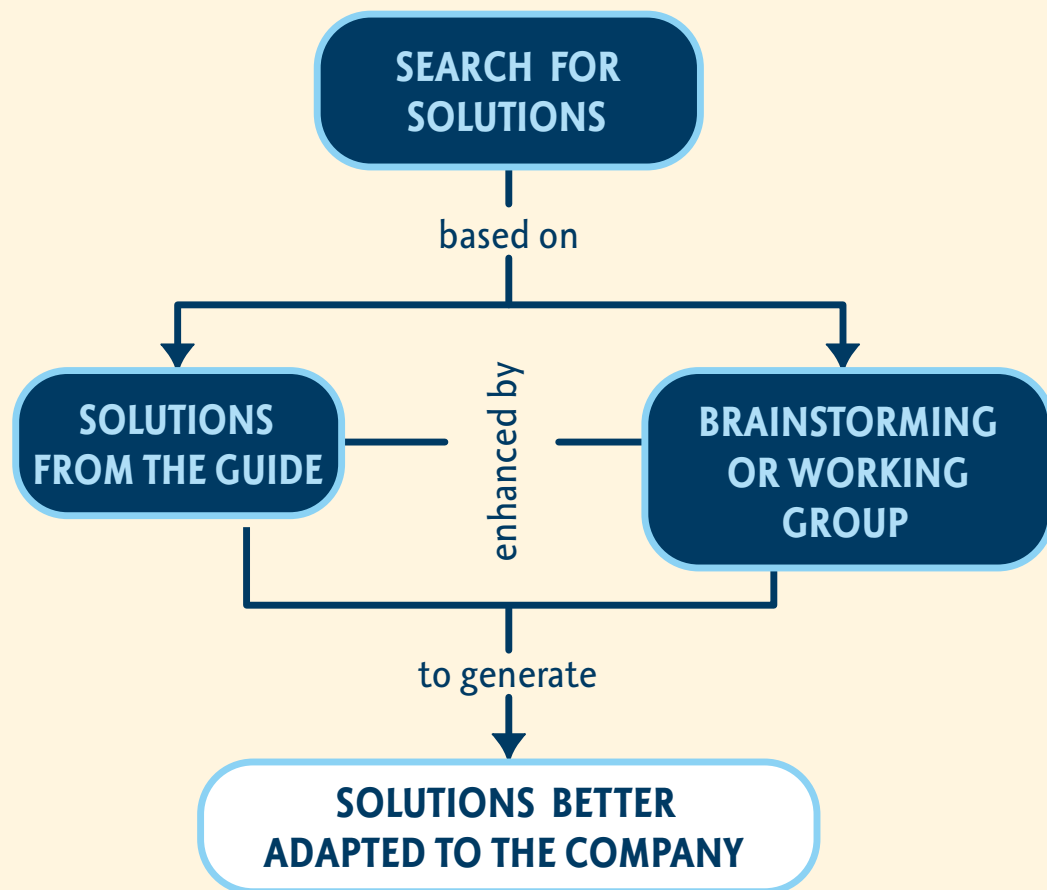
The key is to gather four important types of information for each problem:

1. IDENTIFY THE PROBLEM
2. DETERMINE ITS IMPORTANCE OR SERIOUSNESS. IS IT A PRIORITY PROBLEM?
IS PROMPT ACTION REQUIRED?
3. LOCATE THE PROBLEM. IS IT FOUND THROUGHOUT THE COMPANY OR IS IT PARTICULAR TO ONE DEPARTMENT/UNIT?
4. IDENTIFY A RESOURCE PERSON. DESIGNATE A MEMBER OF THE WORKING GROUP TO MONITOR THIS PROBLEM THROUGHOUT THE PREVENTION PROCESS.

STEP 4 | SEEK SOLUTIONS

Solutions are presented throughout the guide for each problem. In addition, solution sheets are provided for each category: **Circulation of Information**, **Interactions with Purchasing Department**, **Worker Training**, **Physical Layout**, **Equipment** and **Work Organization**.

The members of the working group will have to seek solutions using two combined strategies: on the one hand, referring to the solutions proposed in the guide and, on the other, holding brainstorming sessions to find solutions better adapted to the company.



To make your task easier, you can refer to these two guides:

> **Les groupes ERGO - Un outil pour prévenir les LATR*** (ERGO groups – A tool for WMSD prevention), pages 65 to 74

http://www.irsst.qc.ca/en/_publicationirsst_635.html

> **Work involving varied tasks: an ergonomic analysis process for MSD prevention**, pages 39 to 47

http://www.irsst.qc.ca/en/_publicationirsst_100191.html

* Available in French only

STEP 5 | IMPLEMENT THE SOLUTIONS

The final step consists in implementing the solutions. To do so, the solutions chosen will first have to be tested. Adjustments may be necessary based on the users or the organization. It may be useful to refer to someone in the company who is a “jack of all trades” or to a technical specialist.

For example, when introducing a new piece of equipment or before making a large purchase, it would be wise to conduct tests, that is, have the equipment tested for two to three weeks by three or four workers, under different conditions (*day/evening, with or without customers, in different store departments, etc.*). In short, the goal is to verify whether this equipment is suitable in different situations and for different workers or whether it causes new constraints.

The solutions should be evaluated twice: immediately after implementation, in order to ensure that there is no production interruption, and after a few weeks, in order to analyze the effects on the work.

To help you in this undertaking, a solution evaluation grid is proposed. This grid should be completed in collaboration with the workers affected by modifications (*new facilities, change in work methods, use of a new piece of equipment, etc.*).

Two items are to be completed by the person in charge of follow-up:

- PROBLEM IDENTIFIED
- SOLUTION CHOSEN

The workers will have to answer two main questions:

1. How has the change impacted their work?
(*improves the situation, changes nothing or makes it more difficult*)
2. What are their comments about the problems that still exist?
What should be modified/improved? What are their suggestions?

Lastly, the person in charge of follow-up will have to summarize the comments of the different workers questioned and implement the necessary modifications.

The solution may not be completely appropriate or may cause new constraints. Corrective action must then be taken.

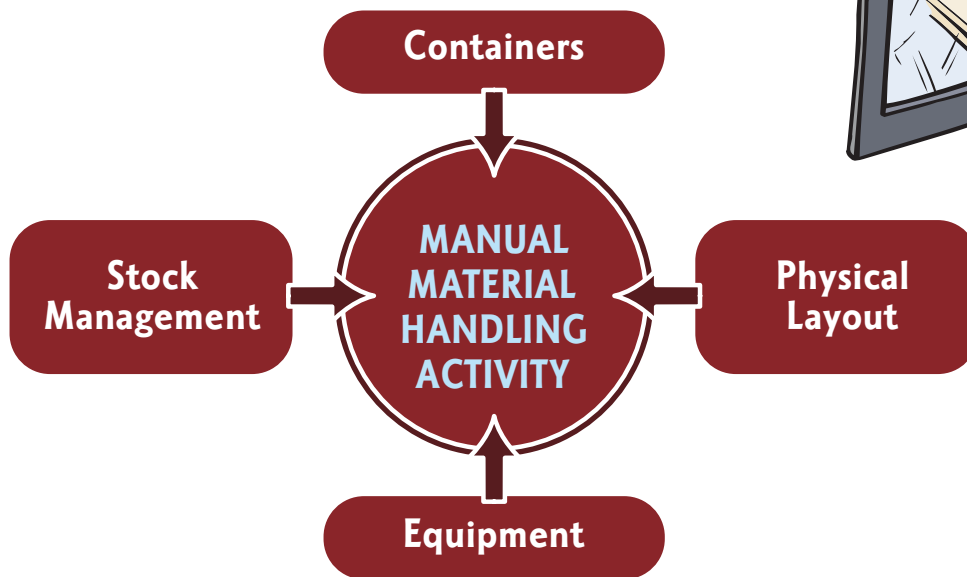
Attention!

This process may help you solve many problems and initiate improvements in the company. However, some more complex problems will require the assistance of a specialist. In such a case, you can refer to safety groups, ergonomics consultants, etc.

1 Manual Material Handling |

RISKS, DETERMINANTS AND SOLUTIONS

FOUR MAIN **DETERMINANTS** THAT HAVE AN IMPACT ON MANUAL MATERIAL HANDLING HAVE BEEN IDENTIFIED: CONTAINERS, PHYSICAL LAYOUT, EQUIPMENT AND STOCK MANAGEMENT.



DETERMINANTS

Elements present in the work environment that can be acted on in order to modify the situation, for example: pickup and placement height (**Physical Layout**), ladder design (**Equipment**), division of tasks within a work team (**Work Organization**), etc.

RISK FACTORS

Elements that increase the probability of injury and/or accident, particularly risky postures, exertion or over-exertion, and customer service under stressful conditions.

1.1 | CONTAINERS

The physical characteristics of containers can have a direct impact on their handling-related risk factors. **Two main characteristics** should be considered:

- A. Volume and weight
- B. Packaging

A. Volume and weight



THESE TWO CHARACTERISTICS ARE PRESENTED TOGETHER BECAUSE THEY ARE OFTEN INTERDEPENDENT.

HOWEVER, IT SHOULD BE NOTED THAT A BULKY CONTAINER IS NOT NECESSARILY HEAVY AND, CONVERSELY, A SMALL CONTAINER IS NOT ALWAYS LIGHT.

A BULKY AND/OR HEAVY CONTAINER MAY:

- › Fall and increase the **risk of accident** due to crushing.
- › Make pickup difficult and increase **muscular constraints**.
- › Reduce visibility and increase the **risk of falls or collisions**.
- › Increase the distance of the load from the body and thus increase **exertion**.
- › Have a weight different from that estimated (+/-) and cause **sudden movements**.



Have you considered...?

Circulation of Information

Promoting discussions with workers regarding the most problematic containers, since they know them well.

Physical Layout

Storing these containers:

- › On a low surface to avoid having to handle them at heights.
- › Near their displays so as to limit their movement during stocking.

Equipment

Providing adapted handling and lifting equipment.

Worker Training

- Promoting teamwork for handling these containers.
- Encouraging workers to evaluate the force to be exerted, before any action.
- Establishing a training session on handling these containers.

Interactions with Purchasing Department

Making the Purchasing Department aware, in its negotiations with suppliers, of the need to:

- › Package the merchandise in smaller quantities in order to reduce the volume and/or weight of the boxes.
- › Indicate the weight on the boxes in order to facilitate weight estimates.

To find out more

Safety / standards

- > **ANSI Standard A14.7 sec. 6.9**, Handrails should be used while ascending or descending the unit
- > **ISO Standard 11228-1:2003**, Ergonomics – Manual handling Part 1: Lifting and carrying



B. Packaging



PACKAGING MAY CAUSE DIFFERENT PROBLEMS:

- › Fragile, pliable packaging increases the **risk of MUSCULOSKELETAL DISORDERS** if the merchandise becomes unstable and a worker tries to recover it.
- › Handles may facilitate pickup, but if they break, there is a **risk of musculoskeletal disorders**.
- › Packaging with too much **FRICTION** prevents the container from sliding, a strategy that is usually beneficial for reducing effort.
- › Packaging that must be cut and/or unwrapped to prepare the product for sale increases the handling of the container and the risk of cuts.
- › The use of a knife is a major known cause of injuries in this sector.



FRICTION

Resistance to relative movement between contact surfaces.

MUSCULOSKELETAL DISORDERS

Disorders or diseases that may be caused by a work-related factor. These types of disorders can affect different parts of the body: upper limbs, lower limbs, neck and back. They can also affect various structures: tendons, muscles, ligaments, certain nerves and other structures surrounding the ligaments.



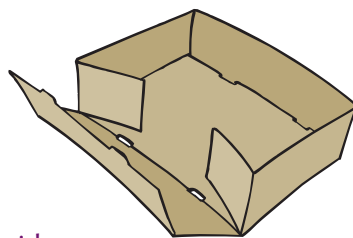
Circulation of Information

Promoting discussions with workers in order to identify the most problematic containers.

Example

Reinforced container:

- › More rigid cardboard.
- › Double-walled on both sides.
- › Higher sides.
- › Reduction in the number of units per container.



Interactions with Purchasing Department

Making the Purchasing Department aware, in its negotiations with suppliers, of the need to modify certain containers in order to:

- › Increase their stability.
- › Reduce their friction, although they must not be too slippery.
- › Reduce the number of operations necessary to prepare products for sale.
- › Add or reinforce handles.

Other

Making marketing representatives aware of the need to adjust their sales strategies so that the number of operations required to prepare products for sale (*cutting, unwrapping*) is reduced.

1.2 | PHYSICAL LAYOUT

Three main constraints related to the physical layout of the sales area and warehouse that can affect work postures are described in this section:

- A. Unsuitable pickup or placement height
- B. Long **VERTICAL PATH**
(picking up low and placing high, or the reverse)
- C. Limited accessibility to load

VERTICAL PATH

Height between load pickup and placement.

A. Unsuitable pickup or placement height



What you should know

A PHYSICAL LAYOUT THAT IS TOO LOW OR TOO HIGH AFFECTS WORK POSTURES WHEN WORKERS PICK UP OR PLACE A LOAD.

Too low

Kneeling or squatting, back bent.



Too high

Hands above the shoulders, on tiptoe, back extended.



Attention!

Note that in this image, wire mesh has been added to the guard rail to prevent workers from using the middle rail as a foot support.

Have you considered...?



Physical Layout

- Increasing or reducing the height of the display shelves or any other accessory used for selling products. Waist height can be used as a benchmark, especially when the product or container is heavy. A marker at the ends of the pallet rack can be used as a reference for limiting the maximum height. (see diagram 37 in the guide *La sécurité des palettiers :...(Pallet Rack Safety:...)*).
- Reducing the height of the stacks on the pallet rack or on any other storage equipment.

Attention!

Space problems in the rackings may make it difficult to reduce the height of the stacks. Go to the “**Stock Management**” section, on page 27, for space problems.



To find out more

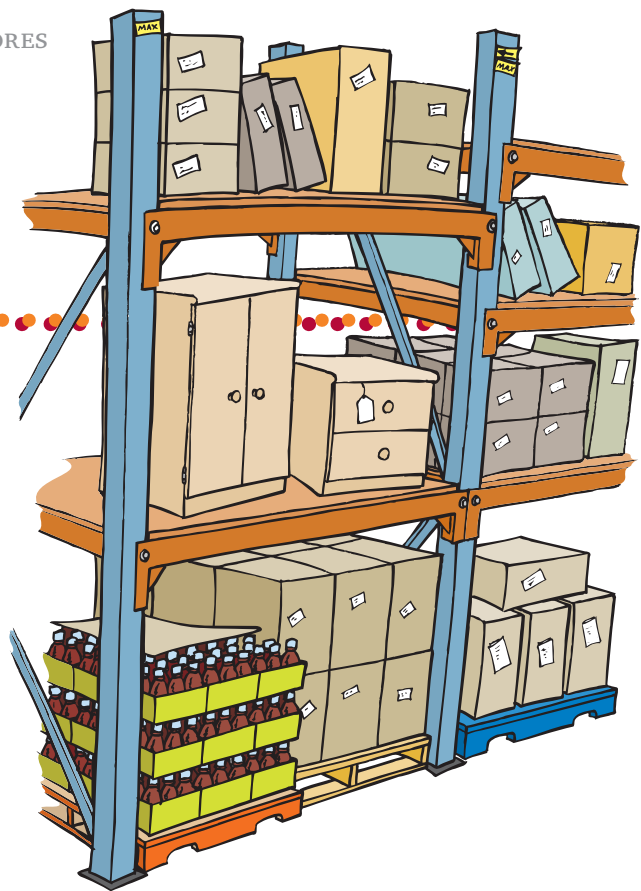


Useful documents

- > **La sécurité des palettiers : fabrication, achat, installation et utilisation*** (Pallet Rack Safety: Manufacture, Purchase, Installation and Use). Commission de la santé et de la sécurité du travail du Québec (Québec workers' compensation board). Legal Deposit – Bibliothèque nationale du Québec, 2005. 113pp.

http://www.csst.qc.ca/NR/rdonlyres/9B720826-E834-415C-8D17-F19CD737C136/1547/dc_200_16147_1.pdf

* Available in French only



- Reducing the height of the pallet rack compartments, which decreases the height at which stockers can stack the merchandise.

Attention!

If the height of the pallets delivered is not modified accordingly and they are higher than the pallet rack compartments, the workers will have to remove merchandise, which will result in extra handling operations.

- Inserting false bottoms in large cardboard containers that are used as displays in order to increase the pickup and placement height.

Worker Training

Suggesting to workers that they place pallets containing few products on a stack of empty pallets, so that the merchandise to be handled is at waist height.

Equipment

- Providing clerks with a low stool for placing merchandise on the lower shelves.
- Using a pallet jack or any other device to raise the pallets so that merchandise can be accessed at waist height.

Interactions with Purchasing Department

Making the Purchasing Department aware, in its negotiations with suppliers, of the need to reduce the height of pallets to the height of workers' shoulders.

Attention!

This solution may have an impact on the transportation of merchandise and therefore generate additional costs.

Attention!

Test the equipment before final purchase.

Example

- › A support for "seated kneeling" posture.



- › A pallet jack designed to raise the pallets to waist height.



- › A lift device for the worker for lowering the container.



B. Long vertical path



A LONG VERTICAL PATH (PICKING UP LOW AND PLACING HIGH, OR THE REVERSE) INCREASES THE CONSTRAINTS OF THE WORK IN TERMS OF POSTURES TO ADOPT AND THE EFFORTS REQUIRED.



Worker Training

Suggesting to the workers that they carry out their handling tasks, when possible, at the same pickup and placement height.

Physical Layout

Reducing the vertical path of the load by using certain solutions proposed in the previous section (A. *Unsuitable pickup or placement height*, on page 14).

C. Limited accessibility to load



What you should know



WORKERS' LIMITED ACCESSIBILITY TO THE LOAD MAY BE DUE TO:

- › A narrow space, for example, between two pallets or two layout structures.
- › A physical obstacle, such as another container or a layout structure.
- › Very deep pallets, displays, shelving.

LIMITED ACCESSIBILITY CAN:

- › Cause awkward positions in confined spaces and injuries when exiting (*ankle sprains*).
- › Increase the risk of contusions.
- › Hinder the worker's ability to react during an incident (*no room to move*).

Have you considered...



Physical Layout

- Increasing the height and/or width between two structures (e.g.: *shelves*) to facilitate depth access.
- Reducing the depth of the pallet rack compartments or displays.
- Maintaining enough free space around the pallet to be able to get around it.

Interactions with Purchasing Department

Making the Purchasing Department aware, in its negotiations with suppliers, of the need to reduce the depth of the pallets.

Attention!

Ensure that the height of the pallets will not be increased to compensate.

Worker Training

- Suggesting to the workers that they move the pallet into a less confined space during handling activities.
- Suggesting to the workers that they remove (*partially*) the pallet from the pallet rack compartment and add the missing products. This could limit awkward postures while increasing handling space.

To find out more



Safety / standards > **Free space:** 600 mm according to sec. 16 of the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety)

1.3 | EQUIPMENT

In warehouse superstores, two main categories of equipment are used: equipment requiring basic training and that requiring recognized driver training (*CSA Standard B-335*).

Equipment requiring basic training

- A. Manual pallet jack
- B. Mobile ladder
- C. Elevating platform
- D. Dolly
- E. Stepladder

Equipment requiring driver training

- F. Lift truck and electric pallet jack

In this document, we will focus mainly on equipment not requiring technical driver training, particularly the manual pallet jack and the mobile ladder; only a few aspects about the lift truck and the electric pallet jack will be presented. In addition, the stepladder will be covered briefly.

WHEN EVALUATING A PIECE OF EQUIPMENT, FIVE ASPECTS MUST BE CONSIDERED:

> DESIGN

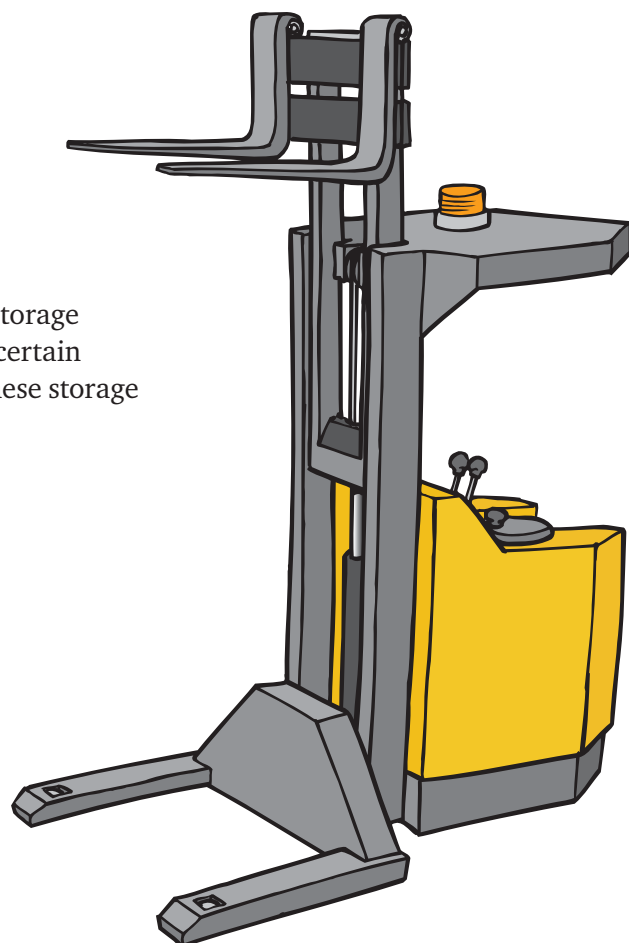
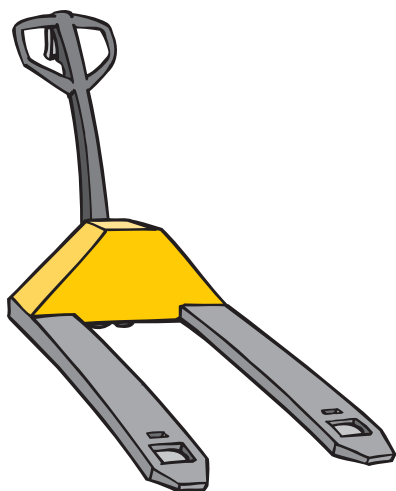
> MAINTENANCE

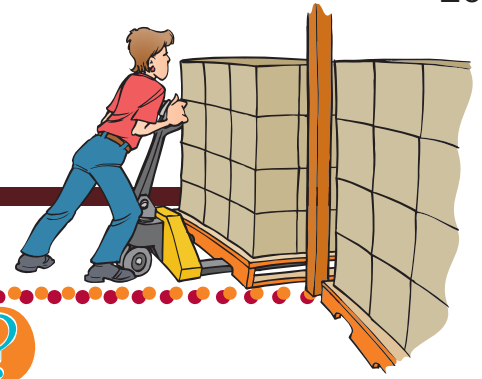
> AVAILABILITY

> MANOEUVRABILITY

> RECOMMENDED USE / SAFETY

In addition, consideration must always be given to the storage of these different pieces of equipment, which require a certain amount of space. It would be beneficial to determine these storage areas *a priori*.





A. Manual pallet jack



DESIGN

A pallet jack that is not adapted to all of the pallets may result in:

- › Increased effort to try to insert the forks inside the pallet.
- › Instability and increased effort when moving the pallet.
- › Wasted time changing the pallet jack for another better-adapted model.

MAINTENANCE

A lack of maintenance may affect the mobility and manoeuvrability of the pallet jack, which increases the effort.

AVAILABILITY

An insufficient number of pallet jacks in relation to the number of users may:

- › Result in wasted time since not enough are available at the desired time.
- › Increase movements to find one elsewhere.

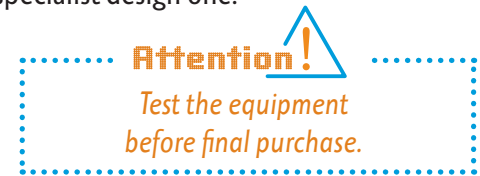
MANOEUVRABILITY

Moving a pallet jack can be physically demanding if it is done:

- › On an uneven floor surface limiting its mobility.
- › In a limited or cluttered space, obliging workers to make several manoeuvres in order to clear the work area.
- › With a fully loaded pallet making it difficult to start, move and stop.
- › With an unstable load that may tip over, especially during a turn, and cause an accident.
- › On an inclined surface: there is a risk of foot injury.



... Acquiring a pallet jack that adapts to all of the pallets, or having a specialist design one.



... Introducing a formal preventive maintenance policy. It is recommended that at least one person be designated as responsible for maintenance follow-up.

... Ensuring that the number of pallet jacks is adapted to the number of users during peak periods.

... Asking workers to inform you about uneven floor surfaces so that they can be repaired.

... Allowing enough space in traffic areas and near work areas.

... Making the Purchasing Department aware, in its negotiations with suppliers, of the need to:

- Reduce the weight of certain pallets.
- Distribute the containers evenly on the pallets and seal everything well, in order to ensure good stability.

... Using an electric pallet jack for pallets that are fully loaded or on an inclined surface.

... Providing safety shoes.



› **Chariots manuels, transpalettes électriques** : livret de l'opérateur : *utilisation sécuritaire des chariots manuels et des transpalettes** (Manual Dollies, Electric Pallet Jacks: Operator's Handbook: Safe Use of Manual Dollies and Pallet Jacks)

* Available in French only

B. Mobile ladder



DESIGN

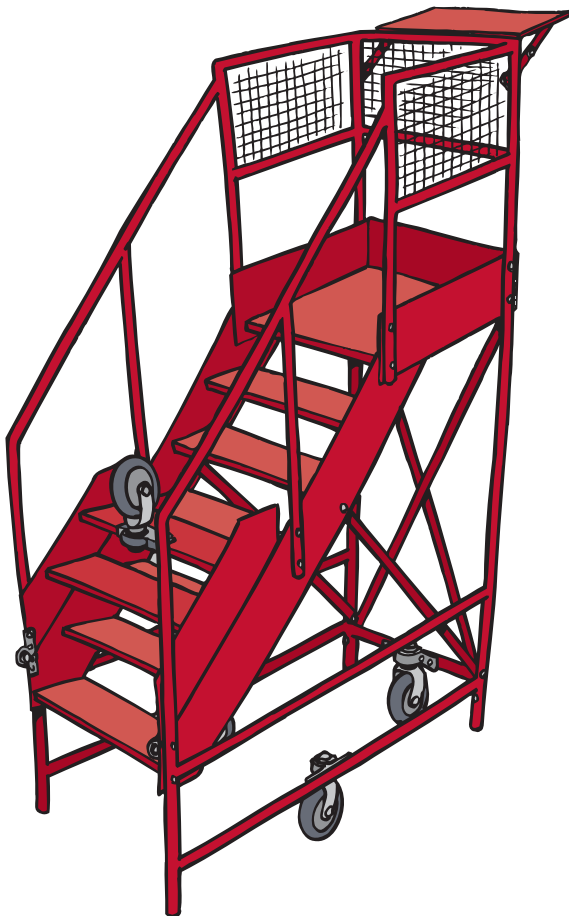
- › **Depth of steps**
- › **Slope of ladder**

Too narrow steps or too steep a slope can make descending a ladder difficult. There is therefore an increased risk of loss of balance and falls.

Platform size: Limited space on the platform reduces foot mobility and increases the risk of loss of balance and falls.

Height: A ladder platform that is not as high as the overheads of the pallet rack obliges workers to work at arm's length and on tiptoe or to use the guard rail as a support.

The higher the ladder, the larger its wheel-base and dimensions.



Have you considered...



- ... Purchasing a ladder adapted to the work as well as to the environment, or having a specialist design a prototype.
- ... Using a lift truck with a driving station that can be raised for placement of merchandise.

Attention!

A worker may place boxes on the ladder platform when trying to make space in the overheads for new merchandise. Therefore, if you plan to increase the size of the platform and the space problems are not resolved, remember that the larger the platform, the greater the number of boxes that can be placed on it.

Attention!

The boxes may be difficult to reach due to clutter in the overheads. Therefore, if you plan to increase the height of the ladder and the space problems are not resolved, remember that the higher the ladder, the higher the stacks.



What you should know

MAINTENANCE

A lack of maintenance may affect:

- › The mobility and manoeuvrability of the ladder, which increases the effort.
- › The stability of the ladder, which increases the risks of loss of balance and falls.

AVAILABILITY

An insufficient number of ladders in relation to the number of users may:

- › Result in wasted time since not enough are available at the desired time.
- › Increase movements to find one elsewhere.

MANOEUVRABILITY

Moving a ladder can be physically demanding if it is done:

- › In a limited or cluttered space or when negotiating a corner turn, obliging workers to make several manoeuvres (*lifting, pulling, pushing*).
- › On an uneven floor surface limiting its mobility.



Have you considered...

... Introducing a formal preventive maintenance policy. It is recommended that at least one person be designated as responsible for maintenance follow-up.

... Ensuring that the number of ladders is adapted to the number of users during peak periods.

... Reviewing certain design elements in order to facilitate its movement (e.g.: *wheel system*).

... Asking workers to inform you about uneven floor surfaces so that they can be repaired.

... Teaching workers how to go up and down the ladder holding the handrail, with three support points.



To find out more

 *Safety / standards*

> **Safety Requirements For Mobile Ladders.** ANSI A14.7-2000. American National Standards Institute, sec. 243 du Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety)

> **Remorque en pente,** sec.243 du Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety)

 *Useful documents*

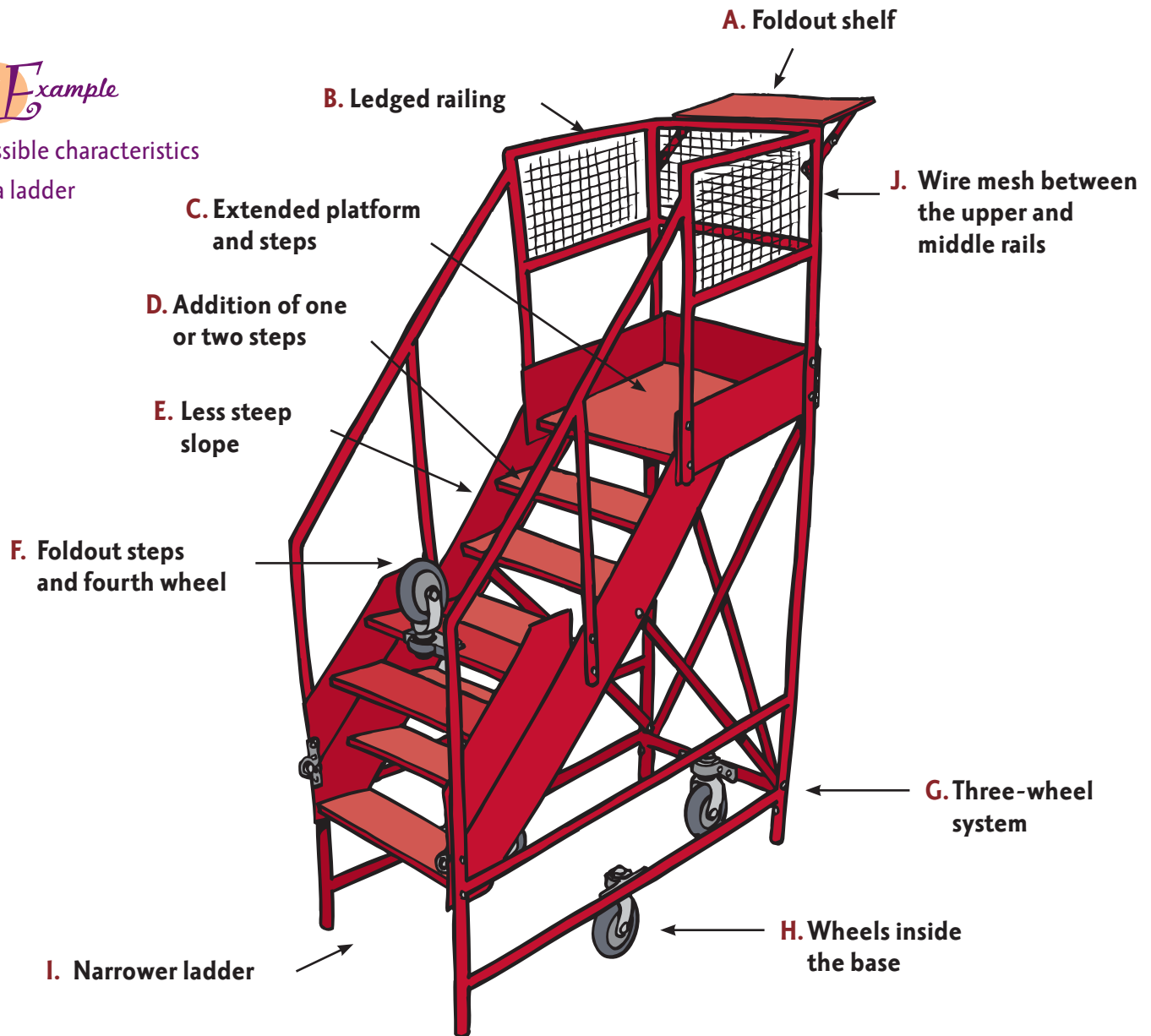
> **La sécurité des palettiers : fabrication, achat, installation et utilisation*** (Pallet Rack Safety: Manufacture, Purchase, Installation and Use). Commission de la santé et de la sécurité du travail du Québec (Québec workers' compensation board). Legal Deposit – Bibliothèque nationale du Québec, 2005. 113pp.

http://www.csst.qc.ca/NR/rdonlyres/9B720826-E834-415C-8D17-F19CD737C136/1547/dc_200_16147_1.pdf

* Available in French only

Example

Possible characteristics
of a ladder



- A. Foldout shelf:** *larger work area*
- B. Ledged railing:** *possibility of supporting boxes*
- C. Extended platform and steps:** *increases foot mobility*
- D. Addition of one or two steps:** *increases ladder height*
- E. Less steep slope:** *facilitates descent*
- F. Foldout steps and fourth wheel:** *facilitates movement of the extended ladder and allows the possibility of moving the ladder with the steps folded or not*
- G. Three-wheel system:** *facilitates control of the ladder when in motion*
- H. Wheels inside the base:** *reduces overall ladder width*
- I. Narrower ladder:** *facilitates movement*
- J. Wire mesh between the upper and middle rails**

C. Elevating platform

The elevating platform can be practical when a large number of boxes must be stocked in the same place or for handling very heavy products.



What you should know

DESIGN

The harness must be equipped with a winder/unwinder including an energy absorber

AVAILABILITY

The harness must be used at all times to ensure the safety of workers.

MANOEUVRABILITY

The elevating platform may not be used often, especially during store hours, because it is heavy and bulky and takes more space and time to use.

SAFETY

A harness that is improperly used or fitted may cause falls. The elevating platform, like all equipment, has lifting limits: exceeding these limits increases the risks.

Have you considered...?

... Getting advice from a specialist regarding the purchase of a basic slip-on harness adapted to the task.

... Verifying the condition of the harness.

... Promoting its use during hours when customers are absent.

... Providing workers with training on how to put on the harness properly and on how to attach it correctly to the equipment: it must be well-secured to the anchor point.

... Providing training on the limits of the lifting equipment and on how to use it.

D. Dolly



DESIGN

Two main models are available:

- › **TYPE 1:** two unidirectional wheels in the middle of the long sides and two swivel wheels in the middle of the ends.
- › **TYPE 2:** two swivel wheels on the back corners and two unidirectional wheels on the front corners.

MAINTENANCE

A lack of maintenance can affect rolling and manoeuvrability and therefore increase the effort.

SAFETY

Going around obstacles may cause merchandise to fall. Climbing on the dolly, meaning using it as a work platform, may cause the equipment to tip over and lead to serious accidents.



... Using the type 1 dolly for locations that require good manoeuvrability and the type 2 dolly for heavy loads.

... Introducing a formal preventive maintenance policy. It is recommended that one person be designated as responsible for maintenance follow-up.

... Ensuring the stability of the load.

... Avoiding too high loads that may reduce visibility.

... Training workers to push and not pull.

... Training workers not to climb up on the dollies.

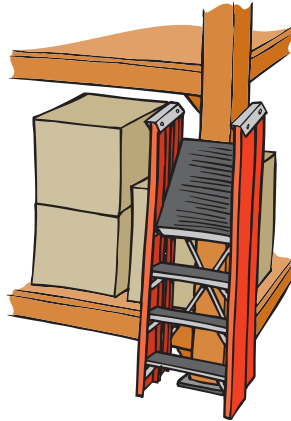
... Making platforms available when necessary.

E. Stepladder

DESIGN

The stepladder should be grade 2, as required by standard CAN3-Z11 sec. 25 of the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety) on portable ladders.

The use of household grade 3 stepladders may increase risks.



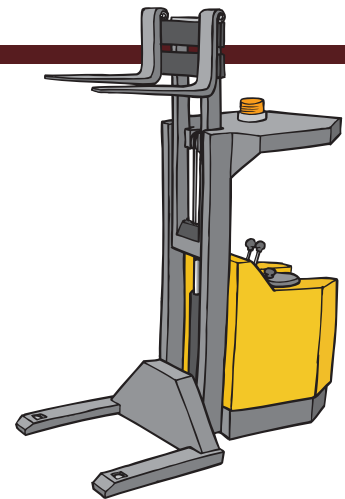
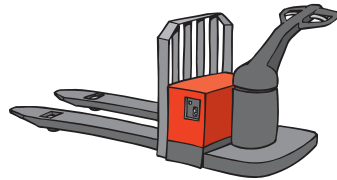
SAFETY

Improperly stored stepladders may tip over on workers. It is important to hang them up after use.

F. Lift truck and electric pallet jack

Driver training is required for operators of these two pieces of equipment.

Prevention guides on the use of this equipment are offered by, among others, the Association Sectorielle Transport Entreposage (Sector-Based Transportation and Storage Association) and Préventex.



To find
out more



Safety / standards

- > The person authorized to operate this equipment must receive training, the content of which is described in standard CSA B-335. This training is mandatory according to section 51 of LSST and the current amendments to the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety).
- > This equipment must comply with standard ASME B56.1 according to section 256 of the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety).
- > It is forbidden to climb on the forks or a pallet to access a container.

Useful documents

- > **Guide de prévention - chariots élévateurs*** (Prevention Guide – Forklift Trucks). Association Sectorielle Transport Entreposage (Sector-Based Transportation and Storage Association), www.aste.qc.ca
- > **Les transpalettes électriques - la prévention des accidents du travail*** (Electric Pallet Jacks – Prevention of Work Accidents). Association Sectorielle Transport Entreposage (Sector-Based Transportation and Storage Association), www.aste.qc.ca

*Available in French only

1.4 | STOCK MANAGEMENT

Stock management is intrinsically dependent on the balance between the order volume, stock turnover and storage space. Inadequate stock management can have negative consequences for both the workers and the company. Three important parameters are discussed below:

- A. Arrival of merchandise
- B. Storage of newly arrived merchandise
- C. Management of excess stock

A. Arrival of merchandise



EXTRA HANDLING OPERATIONS ARE CARRIED OUT BY THE RECEIVER, OFTEN IN AWKWARD POSITIONS, WHEN RECEIVING, SCANNING AND STOCKING MERCHANDISE DUE TO:

- › Small receiving area.

- › Arrival of several orders at the same time.



- › Slow transition of merchandise toward the sales area.

- › Mixed pallets
(several products on the same pallet).

Several of these aspects can cause congestion in the receiving areas.

Have you considered...?

Physical Layout

- Maximizing warehouse space by reducing the quantity of poor sellers (*dead inventory*). This space could be reserved for the clerk for stocking received and verified merchandise.
- Raising the receiver's work area using a manual pallet jack or any other device that could lift the pallets and thereby improve his posture.

Attention!

To be able to use this equipment, the receiver must have enough space in the receiving area to reach the desired pallet without having to move several others.

- Installing a flexible, mobile conveyor to allow the receiver to scan or code non-palletized products. A small table could also be added for order verification. The boxes are then placed on pallets or low dollies before being stored or moved towards the sales area.

Interactions with Purchasing Department

Making the Purchasing Department aware, in its negotiations with suppliers, of the need to group products on the same pallet in order to reduce extra handling operations.

To find out more

Useful documents

> **Les transpalettes électriques – la prévention des accidents du travail*** (Electric Pallet Jacks – Prevention of Work Accidents) Association Sectorielle Transport Entreposage (Sector-Based Transportation and Storage Association), www.aste.qc.ca

*Available in French only

Circulation of Information

Informing the receiver about arrival times and the type and quantity of products so that he can plan his space accordingly.

Worker Training

- Providing the receiver with training in space management (*strategies, tips, etc.*).
- Suggesting that the receiver gradually transfer the products that he scans from a mixed pallet to an empty pallet to make it easier to handle the desired boxes.

Attention!

There must be enough space in the receiving area to add an empty pallet.

Work Organization

- Hiring a team of day and/or night stockers so that new merchandise is routed to the sales area more rapidly.
- Staggering deliveries during the day in order to avoid temporary overstocks.

Other

Be aware that the policy of opening each box in order to verify the contents may have an impact on the number of handling operations. However, a percentage of products for verification can be defined.

B. Storage of newly arrived merchandise



What you should know

DELAYS IN THE ROUTING OF NEW PRODUCTS OR OUT-OF-STOCK MERCHANDISE TO THE SALES AREA MAY CAUSE:

- › Circulation problems in the warehouse due to congestion.
- › Wasted time looking for certain products in the receiving area when a customer asks for them.
- › Extra handling operations to fill empty spaces (e.g., facing).



- › Congestion problems on walkways and walkways towards exits, whereas section 15 of the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety) requires that they be kept clear.
- › Wasted time looking for products that are inventoried as being on the sales floor but that are still in the receiving area.

INSUFFICIENT, INCORRECT OR LAST-MINUTE INFORMATION REGARDING MERCHANDISE TO BE STOCKED MAY RESULT IN WORKERS NOT PLANNING FOR ENOUGH SPACE FOR THE QUANTITY OR TYPE OF PRODUCTS DELIVERED DURING THE DAY. THEY MUST THEN CARRY OUT EXTRA HANDLING OPERATIONS TO CORRECT THE SITUATION, OFTEN WITHIN SHORT PERIODS OF TIME.



Have you considered...

Work Organization

Setting up a day and/or night team to fill and stock the new merchandise.

Circulation of Information

Providing workers with the necessary information about the deliveries so that they can plan product placement more easily (*space necessary, choice of suitable location*).

Physical Layout

Creating a layout plan for walkways and marking them out on the floor (sec. 15 of the Règlement sur la santé et la sécurité du travail (RSST) (Regulation respecting occupational health and safety)).

What you should know

WHEN WORKERS AND LIFT TRUCK OPERATORS HAVE TO WORK AS A TEAM, POOR COMMUNICATION MAY CAUSE THE FOLLOWING PROBLEMS:

› Obstruction by unnecessary pallets on the floor if it is not the desired merchandise or if it is brought to the sales floor too soon.

› Waiting time for merchandise if it is brought to the sales floor too late.



› Transfer of merchandise over long distances if it is brought to the wrong location on the sales floor.

Have you considered...?

Circulation of Information

- Proposing that workers provide lift truck operators with a list of products to be brought to the sales area.
- Making workers aware of the need to inform lift truck operators of when and where to bring the merchandise and, conversely, making lift truck operators aware of the importance of this policy.

Worker Training

Encouraging lift truck operators to promptly remove the pallets that must be put back in the storage spaces, as well as the empty pallets.

C. Management of excess stock



PROBLEMS CAN OCCUR IN STOCK MANAGEMENT WHEN THE QUANTITY OF MERCHANDISE TO BE STOCKED IS NOT COMPATIBLE WITH THE AMOUNT OF SPACE AVAILABLE, OR WHEN STORAGE SPACE IS MANAGED OR USED INEFFICIENTLY. THIS CREATES A LOT OF DISORGANIZATION IN THE MERCHANDISE AND HIGH STACKS IN THE OVERHEADS.

THE FOLLOWING PROBLEMS CAN THEN OCCUR:

- › Wasted time looking for merchandise.
- › Monetary loss when products cannot be found (*dead inventory*).
- › Extra handling operations to move boxes in order to reach the one wanted or to stock new merchandise.



- › Unstable stacks that increase the risk of boxes falling and merchandise being damaged.
- › Awkward postures: being at arm's length and/or on tiptoe to reach the boxes on top of the stacks.

- › Risks of loss of balance and falls on the ladder when workers place boxes on the platform while trying to make space in the overheads.
- › Dissatisfied customers who have to wait while a worker looks for a product.



Work Organization

- Establishing a manual or computerized identification system for excess products or improving it to facilitate the search for products. If you opt for a computerized system, the data must be continually updated for it to be effective.
- Allowing time before the store opens to reorganize the storage space.
- Taking several inventories during the year. This helps keep the storage space organized. The more organized it is, the less time will be spent on future inventories and daily reorganization.
- Taking into account certain aspects necessary for the stability and smooth functioning of the teams, particularly the stockers, in order to promote efficient stock management: proper training, an adaptation period and attractive working conditions.

Attention!

Make sure that the first days of reorganization are done by more than one person in order to prevent work overload. It may be effective to conduct the daily reorganization after taking inventory.

Physical Layout

- Increasing the capacity of some displays to reduce the overstocking of storage spaces.
- Stocking merchandise received in large quantities in the warehouse. For this, the warehouse must be used optimally (*decrease dead inventory, reorganize*).
- Storing seasonal excess in containers outside the store. The manager must then ensure that the storage is safe.
- Carefully planning space in the store and the warehouse for receiving merchandise specific to certain periods of the year (*Christmas, Easter, back-to-school, moving time, etc.*). For example, certain storage space can be freed up and used solely for the excess merchandise related to the event.

Interactions with Purchasing Department

Collaborating with the Purchasing Department because it is your best ally in resolving the above-mentioned issues. Ask buyers to:

- › Modify the purchasing system to create a balance between the quantity of merchandise and the available in-store space, while avoiding stockouts.
- › Reduce the purchase of products that are overstocked in the store (*products previously identified*).

Circulation of Information

Promoting communication between the employees regarding excess merchandise that must be stocked in an alternate location, in order to reduce search time and avoid dead inventory.

Worker Training

- Encouraging workers not to put half-empty boxes back into the storage space, but rather to try to empty these boxes into the displays or into middle level racking. This will increase the available space and the stability of the stacks.
- Encouraging workers to stock boxes in the storage space according to size, with the largest boxes on the bottom, in order to further increase the stability of the stacks.

Attention!

If this is not done systematically and if the space is not managed effectively, this solution may increase the number of handling operations.

- Providing new employees with stock management training (*strategies and tips for stocking merchandise and filling displays, importance and consequences of certain actions, labelling of boxes*).

Other

Ensure that the identification labels on excess products are clearly visible.

Pour en savoir plus

Useful documents

> **La sécurité des palettiers : fabrication, achat, installation et utilisation*** (Pallet Rack Safety: Manufacture, Purchase, Installation and Use). Commission de la santé et de la sécurité du travail du Québec (Québec workers' compensation board). Legal Deposit – Bibliothèque nationale du Québec, 2005. 113pp.

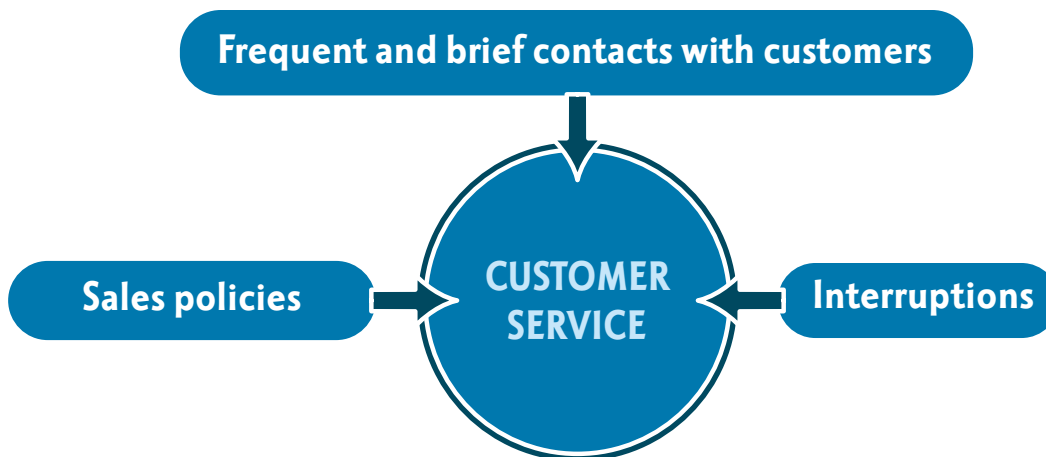
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2

Customer Service | CONSTRAINTS AND SOLUTIONS

SALES CLERKS SUFFER FROM THREE MAIN CONSTRAINTS WHEN SERVING CUSTOMERS: FREQUENT AND BRIEF CONTACTS WITH CUSTOMERS, WORK INTERRUPTIONS AND SALES POLICIES SETTING HIGH OBJECTIVES. THESE CONSTRAINTS CAN CAUSE STRESS AMONG THE WORKERS AND DISSATISFACTION AMONG THE CUSTOMERS.



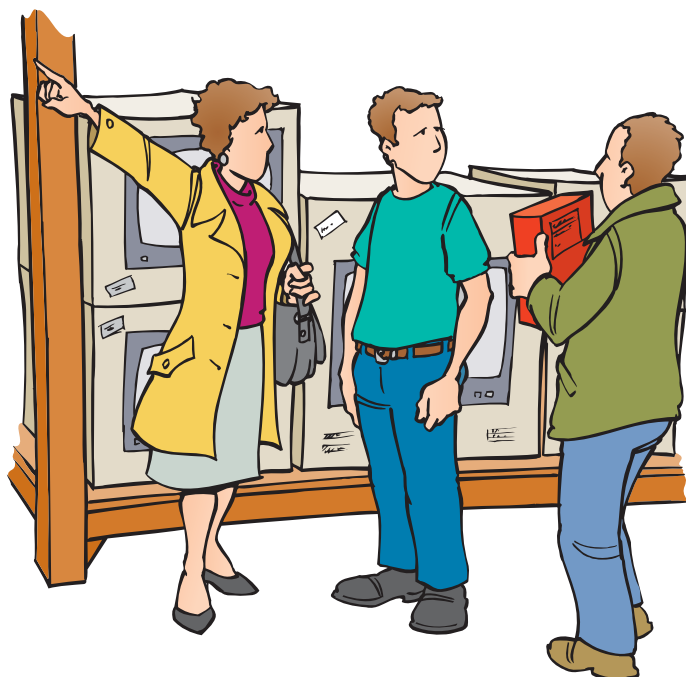
2.1 | FREQUENT AND BRIEF CONTACTS WITH CUSTOMERS



What you should know

A LARGE NUMBER OF CUSTOMERS AND A LIMITED NUMBER OF PERSONNEL OBLIGE SALES CLERKS TO:

- › Serve more than one customer at one time.
- › Deal promptly with customers.



- › Move around the store more often and therefore be approached by other customers.
- › Make customers wait.

Have you considered...?



Work Organization

Increasing the number of sales clerks during peak hours and the lunch hour:

- › The number of customers simultaneously served by a sales clerk would be reduced.
- › The amount of in-store movement would be decreased, thereby further reducing the number of customers simultaneously served by a sales clerk.
- › Customers would receive better service.
- › Car service would be improved.

In-store movement related to product searches for customers can be reduced if stock management is improved.

2.2 | WORK INTERRUPTIONS



What you should know

PERFORMING DIFFERENT TASKS ALTERNATELY WITH CUSTOMER SERVICE ACTIVITIES CAN RESULT IN SALES CLERKS BEING FREQUENTLY INTERRUPTED BY CUSTOMERS. THE NUMBER OF INTERRUPTIONS IS INCREASED DUE TO:

- › High customer traffic (*peak hours*)
- › Limited number of personnel
- › Large number of tasks to perform
- › Numerous telephone calls

ALTERNATING FROM ONE TASK TO ANOTHER CAN:

- › Affect sales clerks' level of concentration when they are performing their duties.
- › Prevent sales clerks from completing their work before the end of their work shift.
- › Affect the quality of customer service.



Have you considered...?



Work Organization

- Increasing the number of sales clerks during peak hours and the lunch hour.
- Eliminating certain tasks during the busiest hours.
- Transferring telephone calls to voice mail during peak hours and whenever a sales clerk is busy with a customer.
- Assigning filling and/or stocking tasks to workers who would do only that. When approached by customers, they would simply direct them to the sales clerks.
- Setting up a night team or a before-store-hours team to perform certain stock management tasks (*filling and stocking*).

Equipment

Providing suitable handling equipment for car service.

2.3 | SALES POLICIES



CERTAIN SALES POLICIES (E.G., EXTENDED WARRANTIES) MAY WORRY AND STRESS SALES CLERKS, ESPECIALLY WHEN THEY HAVE SALES OBJECTIVES TO MEET.



Worker Training

Equipping workers, giving them tips to help them achieve established sales objectives.

Other

Making managers aware of the negative effects that too high sales objectives can have on workers (*stress, dissatisfaction*). These objectives should be increased with care.

Conclusion

In this first prevention guide for the retail sales sector, we have presented a list of critical situations. Some fall into two categories common to several workplaces: equipment and physical layout. Others belong to categories more specific to the warehouse superstore sector, namely, the containers handled and stock management. Considerable effort was put into pinpointing the critical situations associated with stock management, which is a major problem in the warehouse superstore sector.

Many solutions have also been proposed and are grouped into six categories. Three of these categories, **Physical Layout**, **Equipment** and **Work Organization**, feature more traditional solutions. Two categories, **Circulation of Information** and **Worker Training**, propose solutions involving more interactions with workers. A final category, **Interactions with Purchasing Department**, presents solutions that are more original, but that may also be more difficult to implement. It is mainly stores with large purchasing power that can influence suppliers, making this an important avenue to develop for improving handling work.

This guide is intended as a first step towards a better understanding of risk situations and of solutions adapted to warehouse superstores. It will definitely be enhanced by the efforts of prevention specialists and workers in this sector.



Glossary

PALLET RACK COMPARTMENTS

First level of the pallet rack, space where the customer can find merchandise, which is often placed on pallets.

MUSCULOSKELETAL DISORDERS

Disorders or diseases that can be caused by a work-related factor. These types of disorders can affect different parts of the body: upper limbs, lower limbs, neck and back. They can also affect various structures: tendons, muscles, ligaments, certain nerves and other structures surrounding the ligaments.

VERTICAL PATH

Height between load pickup and placement.

DETERMINANTS

Elements present in the work environment on which it is possible to act to modify the situation, for example: pickup and placement height ([Physical Layout](#)), ladder design ([Equipment](#)), division of tasks within a work team ([Work Organization](#)), etc.

RISK FACTORS

Elements that increase the probability of injury and/or accident, particularly risky postures, exertion or overexertion, or even customer service under stressful conditions.

FRICTION

Resistance to relative movement between contact surfaces.

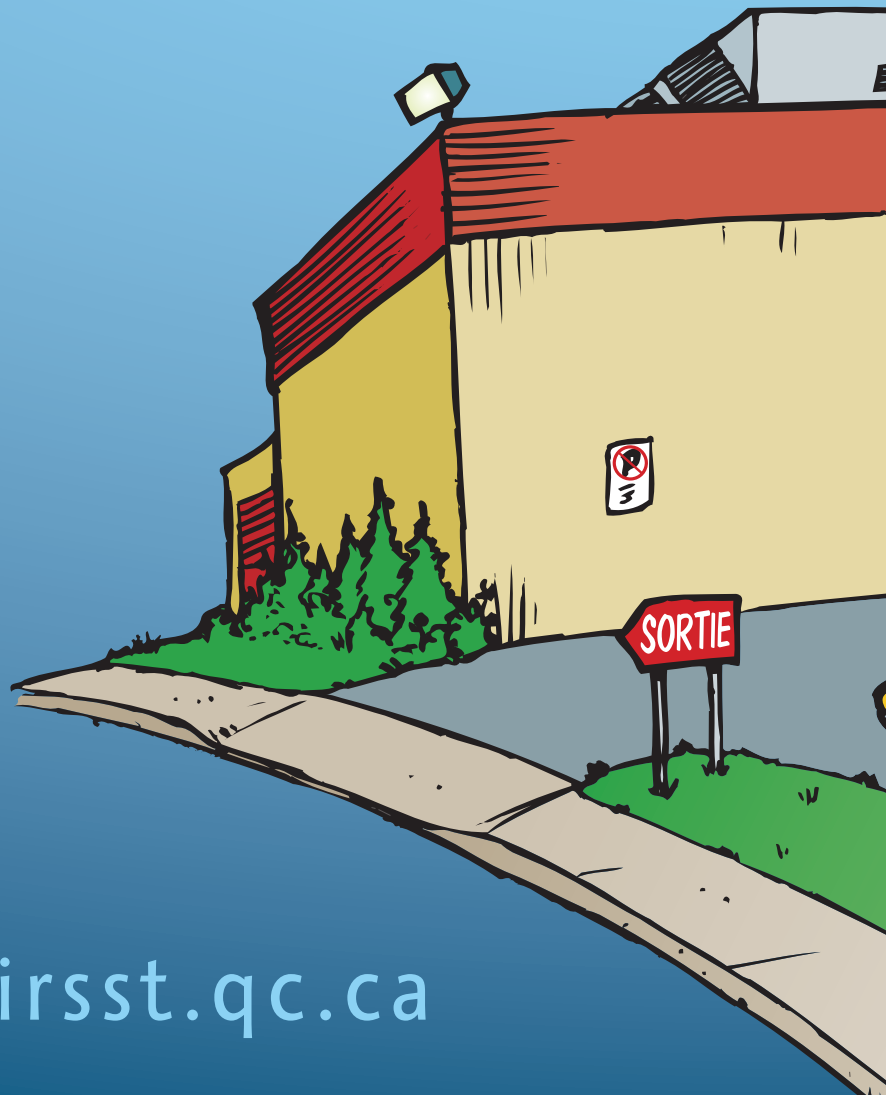
PALLET RACKS, PALLET RACKING, STEEL SHELVING

Structures designed for marketing and storing merchandise.

DISPLAYS

Structures other than pallets used for presenting merchandise to customers.





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