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No matter what activity we may be attempting, we rely on the foundation we are standing on or the chair we are sitting in to support our weight. Surpassing the weight capacity of either can cause a fall and serious injury. The same is true when stacking pallets and skids. An employee must be aware of the weight restrictions and which type of pallets and skids should be used for specific loads. Through the proper knowledge and the ability to recognize potential hazards associated with pallets and skids, employees can avoid a catastrophic event that could cause injury and/or loss of product.
Training Materials

Collect all of the necessary materials and supplies before training begins. Here are some suggested materials and supplies:

• A training location that is free of distractions, has good lighting, and a comfortable temperature.

• Desks and chairs arranged so that everyone will be able to see the viewing screen, the facilitator, and each other.

• The video, a VCR, and a TV with a remote. Make sure the video is rewound.

• An employee handbook and pen/pencil for each trainee. Each handbook includes a quiz at the back, which can be used to test comprehension and document training.

• Other supplies and equipment you may need - blackboard chalk, paper, handouts, transparencies, overhead projector, markers, notepads, etc.

• Additional information, such as a copy of the regulation or other reference tools.
Preparation

A successful presentation requires preparation and planning. Give yourself several days before the training session to get organized.

- Locate and schedule the training site as soon as possible.
- Notify trainees of the training date and time, the training schedule, and proper dress.
- Obtain all necessary equipment and supplies.
- Make sure you know how to operate the TV, VCR, and other equipment. Check to ensure that it is working properly. Replace or repair any damaged equipment.
- Prepare your presentation, including a lesson plan or outline of the training. Include the training goals and objectives. Some presentation guidelines are included on the next page. A sample lesson plan has been included on page “f” of this Facilitator’s Guide.
- A day or so before conducting the training session, you may want to have participants take the quiz as a pre-test. The results of this test can help you to determine weak areas to focus on during the training session.
- Preview the videotape. Note any key points you want to expand upon in your training.
Presentation Guidelines

How you present the training course can have a great impact on learning. By following these simple presentation guidelines and keeping your objectives in mind, you can effectively and efficiently get the most out of your training session.

Organize Training Time Efficiently
In today’s busy work climate it can be difficult to find the time needed for training, so it is important to be organized and well-prepared when you do schedule training sessions. Whether you use Summit’s suggested lesson plan or not, it is important to have a lesson plan prepared that you can implement comfortably. This ensures that time spent in training is productive and beneficial for everyone.

Stress the Purpose and Goals of Training
Training needs to be goal-oriented. State the purpose of training in a clear, specific manner - whether it’s to reduce injuries, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so trainees know what is expected of them.

Capture Their Attention
Training needs to be interesting and compelling to hold trainees’ attention. To help motivate learners, give them specific evidence that their effort makes a difference and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.
Make New Learning Experiences Pleasant
For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Ask If There are any Questions
When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.
Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested lesson plan for your use.

1. Program Objective
This guide reviews *Pallet & Skid Safety*. In it, we will cover:
   - Types of Pallets and Skids
   - Weight Capacities
   - Quality of Wood
   - Safe Handling of Pallets

2. Show the Video: “*Pallet & Skid Safety*”

3. Discussion and Demonstration
To help relate the training to your site, you may wish to incorporate your own discussion topics and exercises. Key issues you might consider include:

   - What procedures must be followed in the event of an incident involving pallets and skids?
   - What should be done with broken or cracked pallets?
   - What type of PPE is required when working around pallets and skids?
4. Use Handbooks to Reinforce Training
The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee information retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator’s Guide is provided to document employee training. Answers to the quiz are provided on a separate page.

5. Questions and Answers
Provide for a Q&A session to answer any questions. It may be necessary to review some of the material when providing answers. The employee handbook, equipment manuals, and other reference tools may be helpful.

Other relevant Summit titles that might be of interest:
Heads Up: Warehouse Safety
Forklift Safety
Back Safety
Delivering the Goods
Slips, Trips & Falls
Frequently Asked Questions

What should be done if I notice a damaged pallet?
If you notice a damaged pallet that is in poor condition, replace it. It is better to replace it before it collapses and causes injury. Before replacing the damaged pallet, first remove all material that is stacked on top of it. Be sure to discard the damaged pallet and estimate the cost of the new pallet and how much time it took to replace it. Once you have your estimate, pass this on to your supervisor.

What should I look for when determining a pallet’s wood quality?
The first thing to look for is whether the pallet is dry. Any rotted wood could cause structural issues. Next, look for shakes, checks, and splits in the wood. If you notice any nails that are sticking up, drive them flush or below the board’s surface. Any pallet found to be in poor condition should be replaced.
Introduction

Buildings are built for specific purposes. Skyscrapers for work, schools for education, stadiums for games.

Each building is a mix of form and function, trying to be visually pleasing while fulfilling the purpose for which it was made. Foundations do not typically contribute to the architectural aesthetics of a building. Yet, without a suitable foundation, a building would be useless; it would neither function effectively nor be safe to occupy. A firm foundation is also needed when handling large quantities of goods, this foundation is created through the use of pallets. Pallets are used to unitize, protect, store, and transport goods. It’s very important to have the right pallet for a product. You wouldn’t pour a foundation for a house and build a skyscraper on it. The pallet needs to be able to safely support the product.
Wooden pallets are useful in material handling because they allow us to stack and move materials safely and quickly. It’s easy to underestimate the hazards related to pallets, yet each year many people suffer injuries from mishandling and misusing them. Over half a billion pallets are manufactured each year; they are everywhere. Learning about pallets and their limitations will help ensure the safety of the product and most importantly the worker.

In this handbook we will cover:

- Types of Wooden Skids and Pallets
- Weight Capacities
- Quality of Wood
- Safe Handling of Pallets
There are many different variations of pallets and skids and knowing which type you are working with helps ensure that they’ll be used safely. Pallets come in two styles: stringer style and block style. The main advantage of block pallets is full access to all four sides for both forklifts and pallet jacks. Pallet size is expressed as a pallet’s length multiplied by the pallet’s width. Pallet length is either the length of the stringers for stringer-class pallets or top stringer-boards for block-class pallets. The pallet width is the length of the top deck-boards.

A pallet, sometimes called a skid, is a flat structure that supports goods in a stable fashion while being lifted by a forklift, pallet jack, or overhead crane.
There are three basic pallet styles.

- The single face,
- Double-face non-reversible,
- And the double-face reversible.

The single-face pallet only has one deck and is also referred to as a “skid”. Double-face non-reversible pallets have a specific top face and a specific bottom face which are not interchangeable. Double-face reversible pallets have a top and a bottom deck which are identical, and as the name implies, can be used on either side. How a pallet is entered by a
forklift or pallet jack further defines its design. 2-way pallets can be entered and lifted by a forklift or a pallet jack from two sides. Partial 4-way pallets have stringers notched for fork tine entry. These notches are rarely sized to accommodate pallet jacks, which can only enter the pallet from the ends. Only forklifts should enter and lift the pallet from the sides.

There are several different base types that a pallet may have. Stringer-class pallets can have lumber bottom deckboards or a panel base. Block-class pallets may have a panel base, or a perimeter base. The perimeter base is characterized by boards oriented in both directions but in the same plane. In this design there are boards continuously around the bottom deck perimeter which adds rigidity and prevents crushing.
There are three different types of deck styles. Flush, single-wing, and double-wing. On a flush deck the ends of the deckboards and edges of the panels are flush with the stringer or stringerboard edge. For panel deck-block-class pallets without stringer boards, panel edges are flush with block edges. On a single-wing deck, the top deckboards and edges overhang the stringer or stringerboard edge, and if there is a bottom deck it is flush. The single-wing style allows the use of sheet lifters to move the material. The third style of deck is the double-wing deck; it overhangs on the top deck and the base. The bottom wing must be less than or equal to the top wing.
The picture to the right is an example of a double faced single-wing skid with a perimeter base. It is being used to move metal sheets. This design was chosen because of its stackability, crush resistance, and lateral collapse resistance. Make sure you can identify the different types of pallets and skids in your facility.
Weight Capacities

Imagine you are about to bungee jump for the first time.

Would you just strap on the bungee and jump? Or would you check the weight capacities of the bungee, check the length and stretch of the bungee and know how much you weigh and the height of the platform you were jumping from? The second option would be the wise choice just like it is wise to know the limitations of the pallets being used.
While it may take over 7,000 pounds to crack hardwood like elm, it only takes 1,300 pounds to crack a softwood like spruce. Make sure to know the capacities of the pallets you use.

Most facilities rely on pallet suppliers to properly design and manufacture the required pallets based on the specified weight, dimensions, and means of handling the pallet. For most load bearing equipment the maximum load limit is indicated. Unfortunately, most pallets are not marked in a manner that would clearly identify load limits. If you are not sure what a pallet’s capacities are, ask your supervisor. There should be no guesswork.
Lateral collapse is a failure mode in stringer pallets characterized by lateral movement of the top vs. bottom deck, rotational failure of all stringer deck connections, and collapse of stringers onto their sides. When this happens, handling equipment can no longer enter the pallet and product damage is likely. Lateral collapse most frequently occurs during shipping when horizontal forces cause lateral movement and/or shifting of the load perpendicular to the stringers. Forces during handling of the pallet can also cause lateral damage. When stacking pallets know your facility’s stacking limits. In the example above, all the weight is being put on the bottom pallet. If that pallet is over its capacity it could collapse causing a very dangerous situation. Certain types of pallets can be nested together when empty to reduce space requirements.
Quality of Wood

When determining the quality of wood, the number one issue is moisture content.

The presence of moisture in pallet lumber can cause problems for both pallet and load quality. The pallets should be dry to avoid any transfer of moisture which could result in packaging decomposition, rust, mold, or mildew. If a skid is wet then it will be a lot less rigid, and will not be at its full strength. A wet pallet will lose 25 percent of it’s strength. Stains and mold do not cause structural issues, but look for rot in the wood, as a pallet with rotten wood will not hold its designed weight.
The quality of the wood used is vital to the integrity of a pallet. Look for shakes, checks and splits in the wood. A shake is the separation of the wood parallel to the grain along the growth rings. It can be caused by excessively high temperature in the early stage of the drying process or by felling the tree along uneven ground, causing the bole to bend and separate along the growth rings. A check is a split that occurs during the drying process.

Inspect the pallet before placing material on it. Look for nails that are sticking up that could damage the product or injure a worker. When you find an exposed nail, drive it flush or below the boards surface.
Be proactive. If you notice that a pallet is in poor condition, don’t wait for it to collapse before replacing it. When a pallet needs to be replaced, replace it. This will save time and money and make the work environment safer. When it has been determined that a pallet will not hold its load and the pallet needs to be replaced, the first step is to remove the material and replace the bad pallet with a new pallet. Discard the bad pallet. Then estimate the cost of the new pallet and the time it took to replace it and give that to your supervisor.
Safe Handling of Pallets

When it comes to pallet safety, every company develops rules and standards specific to their work environment.

There are, however, some basic guidelines that almost all companies follow. The first rule when handling pallets, is to always wear the appropriate PPE to help prevent injuries. Gloves will protect your hands from lacerations and splinters. Before using a pallet, check its overall condition to make sure a heavy load can be safely stored on it. The boards should not be cracked or have any missing pieces. There should be no protruding nails or slivers of wood on the pallet. When you find an exposed nail, drive it flush or below the boards surface.

It may seem like a lot to inspect, but as you gain experience, a quick look...
can tell you if the pallet is in a safe condition. When removing a pallet from a stack, do not pull it part way off the stack and then let it drop. A falling pallet could cause damage to the pallet and more importantly injure your feet or legs. The proper way to remove a pallet is to slide it off the side, tip the pallet, firmly grasp the deck boards, let it slide down the stack as you guide it, and gently place the pallet on the floor. Maintain control of the pallet at all times. If you need to move a pallet, stand it up on its edge and slide it, pulling it from the end. Be careful when sliding pallets. If the pallet hits a crack or bump in the floor, the pallet could stop suddenly, and either fall or cause injury. Be alert, and watch where you are going.

Pallets should not be lifted or carried as they weigh approximately 65 pounds and are awkward to carry. Do not throw pallets. You can easily injure your back or other ligaments and the pallets can be damaged.
Do not store pallets on their edges or ends. Falling pallets cause many injuries so make sure to stack them properly. Whenever possible, walk around a pallet. Walking on a pallet increases the possibility of a slip, trip, or fall. Also, your feet can get caught in the openings, or boards can break. If you must walk on a pallet, try to keep one foot on the floor for traction and stability.

Now, let’s talk about how to properly stack pallets. First slide the pallet up to the side of the stack. The deck boards should be vertical and facing you. Grip the deck boards and slide the pallet up the side of the stack, over the top and onto the stack, then square the new pallet with the rest of the stack. Make sure to keep your back straight and bend at the knees.
In this handbook we have covered different types of skids and pallets, weight capacities, the quality of wood, and safe handling of pallets. There are many different kinds of pallets and skids. So make sure to use the appropriate pallet or skid for your product. Know the limitations and weight capacities of the pallets in use. Make sure to properly secure the material to the pallet. Constantly check the quality of the wood and look for any wet or damaged pieces. Replace pallets that will not hold their weight. Make sure to wear the proper PPE when handling pallets.

Protect your back and lift the pallets properly. Pallets are the foundation of the transporting industry. By using pallets correctly you are preventing damage to product, but, more importantly, you’re helping to keep you and your co-workers safe.
To review your knowledge of *Pallet & Skid Safety*, answer the questions below.

Your name    Date

1. What is the main advantage of block pallets?
   a. They can be accessed by all four sides using forklifts and pallet jacks.
   b. They can be accessed on only two sides by forklifts and pallet jacks.
   c. The pallets are made of blocks that can support 1000 pounds.
   d. There are no weight restrictions with block pallets.

2. All pallets clearly identify their load limits.
   a. True    b. False

3. What type of things should be checked when inspecting a pallet? Select all that apply.
   a. Be sure the pallet is dry
   b. Check that there are no loose or protruding nails
   c. Look for shakes, checks, and splits in wood
   d. Look for rotted wood

4. The strength of a pallet is reduced by what percentage when it is wet?
   a. 0%
   b. 10%
   c. 25%
   d. 50%
5. When should pallets be inspected?
   a. Before loading material on it.
   b. After loading material on it.
   c. Once a month
   d. Once a year

6. If you notice a pallet in poor condition, what should you do?
   a. Wait for it to collapse and then transfer the material to
      a new pallet.
   b. Leave it alone and hope the next worker notices it.
   c. Replace the pallet
   d. Evacuate the building.

7. Gloves should be worn to protect your hands when handling
   pallets.
   a. True           b. False

8. The proper way to remove a pallet from a stack is to slide it
   off the side, tip the pallet, and then let it drop to the ground.
   a. True           b. False

9. What is the proper way to move a pallet?
   a. Pick it up and carry it
   b. Stand it up on its edge and push it from behind
   c. Stand it up on its edge and pull it from the end
   d. Throw the pallet
   e. Kick the pallet to its new location

10. Pallets should be stored on their edges or ends.
    a. True           b. False
1. a They can be accessed by all four sides using forklifts and pallet jacks.

2. b False

3. a Be sure the pallet is dry
   b Check that there are no loose or protruding nails
   c Look for shakes, checks, and splits in wood
   d Look for rotted wood

4. c 25%

5. a True

6. c Replace the pallet

7. a True

8. b False

9. c Stand it up on its edge and pull it from the end

10. b False