

This month's theme: Coiling & Reeling Production and Post Production Activities.

All personnel should be trained in the use and safety protocols prior to using any machinery or equipment for producing or moving reels and coils of pipe or conduit. Employee exposure to hazards will differ depending on the type of reel winders and coilers (automatic, semiautomatic) and the packaging systems according to the customer's requested orientation (i.e., metal reels, wooden reels, palletized vertically or horizontally, stretch wrapped, etc.). However, automatic coilers will relieve much of the need for employees to come in contact with the product throughout the packaging of finished goods.



Reel



Wood reel with a pallet nailed at the bottom (not shown)



Stable vertically



Palletized Horizontally

The following information describes typical hazards and safety controls that manufacturers should consider for minimizing the exposure to hazards during the coiling and packaging process steps.

Step 1, assembly and moving reels to the winder/coiler:

- An apparatus for securing the flanges during assembly should be used.
- Never use two mobile/lifting methods at the same time.
- Empty reels can be moved with a tugger.
- It is recommended that conduit or pipe loaded reels should be moved by forklifts or cranes.



Reel in the tugger

Step 2, Initial Winding – securing the pipe or conduit:

- At start-up, ensure that the end of the pipe is properly secured to the coiler or reel, so the pipe end is not loose. Particularly in larger diameters, if the pipe end is not secured properly and escapes it will unwind rapidly due to the sudden release of stored energy. This can cause serious damage or injury to nearby personnel.
- Never try to tie the pipe or conduit end while the winder/coiler is in motion.
- Tie one end of a rope length to the end of the pipe and tie the other rope end to coiler/winder drive arm or to an inner stave on the reel and allow the rope to pull the conduit/pipe into startup position.

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Step 3, Final Winding and strapping:

- Pipe/conduit ends are cut using a manual reciprocating saw or an automated cut off saw once the required length is reached.
- In preparation for winding the final end onto the coil/reel, tie the end of the pipe with a length of rope.
- Ensure the rope selected is strong enough and securely tied to prevent the pipe/conduit end from springing back due to the force from coiling. The amount of force exerted on the ties will increase as the diameter and wall thickness of the pipe/conduit increases.
- With the winder/coiler stopped or with the coil/reel placed in a secure position place bands around the coil at set intervals.

General Coiler Safety:

The rotational energy of coiling and winding equipment is significant (remove high) enough to cause serious injuries. It is important that workers body parts or clothing not come in contact with any part of the coiler when in motion.

- It is recommended that the coiler is isolated with a perimeter guard during operation to protect workers from coming in contact with moving parts, since contact could cause injury. For additional protection it is important to place all control panels outside of the perimeter guard.
- To make adjustments during operation, the coiler must be brought to a complete stop. It is suggested that the coiler be provided with interlocked guards, that will automatically stop any motion once the interlock is activated. If interlock guards are not provided then a lockout specific procedure should be provided.
- Maintenance activities must be done following the equipment LOTO procedures.



Perimeter guard around the coiler

Horizontally Palletized coils:

Removing coils manually from the winder onto a pallet.:

- **Ergonomics:**
 - Ensure operators know the weight of the coil before removing from the winder.
 - Coils that weight 20 kgs (44 lbs) or less can be removed by one person, for heavier coils two people or use of a crane or any other mechanical device should be used to assist in lifting. A C-hook and crane is recommended.
 - When lifting loads below the waist level, always use proper ergonomic lifting techniques by bending your knees rather than your back and wearing a brace.
 - Avoid manually lifting loads above the shoulder height which can increase the risk of shoulder and back injuries.
 - Coils should be stacked securely to prevent them from toppling over and causing injury to nearby personnel. If a load appears



50 kgs (110 lbs)

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to be unsafe and do start to topple employees should get out of the way, so they are not hit by the coil falling.

- **Prevent stack of coils from falling:**
 - Storage of pipe/conduit coils should be securely banded to skids and placed on a level surface.
 - Carefully place coils on the top of each other, keeping them centered on the pallet for stability. The maximum allowable stacking heights for polyethylene pipe should not exceed those in Table 2: Suggested Loose Storage Stacking Heights for HDPE Pipe (located in Chapter 6: Pipe and Fitting Storage) of the PPI material handling guide which is available on the website.
- **On the stretch wrapping machine:**
 - Begin by using low rotational speed to avoid the coils from falling or use a rotary arm wrapping machine where the stack remains stationary.
 - Remain clear while in the wrapping machine is in motion; use the E-stop button, then adjust the stretch wrap if needed.

Handling large and heavy coils without reels

- For coils removed from the line that are to be stored vertically.
 - To prevent the coil from falling, ensure coils are supported by a properly engineered structure with a “type hook” or inverted “L” frame support.
 - Vibration or other machine motion may cause vertically stored coils to become unstable or fall if not secured properly.
- Transport coils by a crane, forklift, or any other mechanical assisting device.
- Before lifting with a crane, ensure that the center of gravity for the load is vertically lined with the hook of the crane. This will help prevent the coil from swinging.
- Move the crane gently and slowly.
- Operators should remove themselves from the swing radius of the crane and should stand clear as the coil is moved in case it becomes unstable or slips from the sling.
- When using a wireless tethered remote control make sure it is sufficiently long enough to provide clearance for safely moving the crane’s load.



400 kgs (882 lbs)

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Removing reels from the coiler

- After completing the reel, ensure when operators lower it to the floor that it does not roll.
- After lowering the reel to the floor and before disconnecting from the coiler placed chocks under both sides of the reel to prevent unanticipated movement of reels.
- All personnel should be out of the potential path where the finish coil could roll, preferable in a designated Safety Zone.
- Never roll a full reel by yourself.
- Never try to stop a reel by yourself.



Moving reels with forklifts:

- When lifting reels with chains, do not lift by the flange rings. Thread the chain through the arbor holes. Synthetic slings should never be threaded through the arbor holes because the sling may be cut by the arbor plate.
- Tilt forks slightly upward before moving the load.
- Before lifting, the load should be centered, and forks positioned at the widest position under the load for correct stability.
- Ensure the forklift has a lifting capacity rating sufficient to handle the load.
- When using forklift attachments or fork extensions, ensure they are approved for the load being handled.
- When carrying loads large enough to block view, travel in reverse with load close to the ground, if you cannot see in the direction, you must travel then you must have a spotter.
- Carry all loads close to the ground. When traveling on grade with a load, face the forklift uphill when either going up or down.
- Use extra caution when traversing uneven areas of pavement and reduce speed to cross the areas safely.
- There should be enough space to maneuver the forklift safely, so it does not create hazardous conditions with pedestrians and other workers.
- Forklift safety rules are to be observed during all phases of the moving process.
- Never leave forklift running or an overhead load suspended if the lift is unattended.

