

ERGONOMIC Safety Data Sheet

From the Pulp and Paper Health and Safety Association (PPHSA)

Bobst Flat-Bed Die Press*

General Data

Staffing:	usually 2 workers per crew (1 operator, 1 assistant)
Shift length:	8 or 12 hours
Breaks:	1 lunch and/or dinner, 2-3 10-minute coffee breaks
Issues:	Shoulder and low back strains

Tasks Descriptions

Operator's primary tasks

- set up plate, chase, steel die and jigs on press
- ensure quality of output
- monitor press when in operation
- load / feed sheets of corrugated (1)
- push skids of sheets along conveyors to loading area of press (2)

Assistant's primary tasks

- assist with set up of press, primarily male and female jigs
- moving pallet of corrugated sheets onto in-feed table
- removing full pallet of processes sheets from out-feed table
- handling of wooden and plastic pallets
- manual stacking and piling of processed sheets (1)
- pushing/pulling of pallets of sheets on pallet jacks (3)

The application of ergonomic principles in the workplace is essential to the prevention of work-related musculoskeletal disorders—MSDs

Identified Risk Factors for Musculoskeletal Disorders

The key risk factors for work-related musculoskeletal disorders that are associated with the tasks performed at a flat-bed die cutter are documented below. (4)

Risk Factor #1:

Lifting and Handling of Wooden and Plastic Pallets

Handling of wooden and plastic pallets at the die cutter (either at the in-feed or out-feed end) may place the worker at a significantly increased risk of injury. Factors that may increase the risk of injury include:

- weight of pallet (20 – 38 kg)
- height / location of pallet when first lifted
- height / location of pallet when put down
- method used when handling pallet
- frequency of pallet handling
- state of repair of pallet

References:
(1) – some flat-bed presses may be manually fed and/or may require manual stacking / piling of sheets after they are processed
(2) – non-motorized roller conveyors are often used to deliver pallets of sheets to the die cutter
(3) – some work-places move pallets of sheets to/from the press on powered and/or manual pallet jacks
(4) – based on observations of 4 different flat-bed presses in 3 different work locations



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Risk Factor #2:

Handling of steel dies

The flat steel dies used in the die press are typically stored in a common die storage area in the plant. Workers will retrieve the dies from the storage racks and move them to the die press. The risk of injury associated with this task may be high if the worker must manually remove the dies from the storage racks and/or carry the die to the press. Once at the press the operator may be required to put the die down before it is lifted and placed onto the die plate. Factors that may increase the risk of injury include:

- weight of die (10 – 20 kg)
- height / location of die on racks
- height / location of die stand
- method used when lifting / moving die
- need to carry die up/down steps

Risk Factor #3:

Pushing / pulling of pallets of sheets

Pallets of sheets are delivered to the die press via roller conveyors or pallet jacks. If the conveyors or pallet jacks are not powered, then the worker must manually push the pallets into position for feeding the die press. Some die presses have systems for automatically stacking processed sheets. With these presses the worker may have to manually pull/push the full pallet of processed sheets from the machine to a storage area. Factors that may increase the risk of injury include:

- force required to push/pull pallets (10 – 35 kg)
- condition of roller conveyor or pallet-jack
- method used when pushing/pulling the pallet
- frequency of pushing/pulling

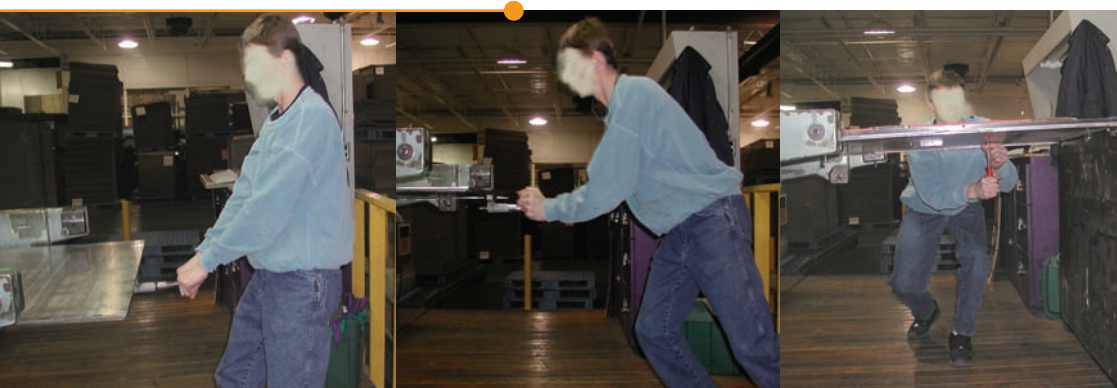


Risk Factor #4:

Mounting / installing die on chase

After a die has been lifted onto the chase, the die is fixed to the chase plate by installing screws from the underside of the plate, through holes, into grommets in the die. This requires awkward work postures—and pulling the chase from, and pushing the chase into, the die press can require extreme force. Factors that may increase the risk of injury include:

- force required to pull / push the chase (15 - > 70 kg)
- frequency of die changes
- size / flexibility of worker
- number of screws put into die
- work method used to install die



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Risk Factor #5:

Mounting / installing jigs

The press jigs are mounted inside the die press after the steel die. Installing both the male and female jig requires the workers to lift the jigs and adopt awkward postures that are potentially harmful. Workers must also retrieve the jigs from the storage area and bring them to the die press. Factors that may increase the risk of injury include:

- weight of jigs (8 – 25 kg)
- design / access to the jig mounting area
- design / access to the area under jigs
- frequency of jig change



Risk Factor #6:

Manual palletizing of processed boxes

Many die presses require workers to manually palletize sheets after they have been processed. Workers grasp a stack of sheets from the out feed conveyor/ rollers, lift/move the sheets, and then stack them onto a pallet. Factors that may increase the risk of injury include:

- weight of sheets
- number of sheets grasped
- height of sheets when picked up
- height of pallet/stack of sheets
- method used to move sheets
- frequency of handling

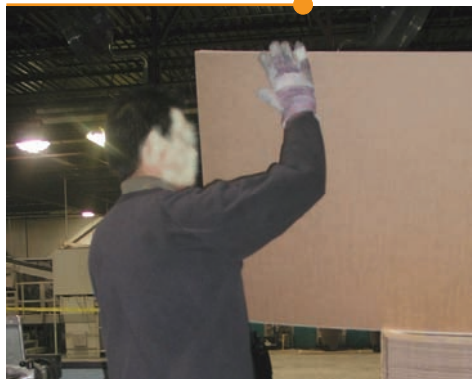


Risk Factor #7:

Manual feeding of die cutter

Many die presses require workers to manually feed sheets into the press. Workers will grasp a stack of sheets from the pile on the in-feed pallet, lift the sheets, turn to face the in-feed station, and then place the stack onto the sheets in the feeder. Factors that may increase the risk of injury include:

- weight of sheets
- number of sheets grasped
- height of sheets when picked up
- height of sheets in feeder
- method used to move sheets
- frequency of handling



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Recommendations

Recommendation #1:

Eliminate / reduce / improve manual handling of pallets

Consider the following to keep manual handling of wooden / plastic pallets to a minimum:

- Use a pallet stacker / dispenser to store and dispense pallets when needed
- Use a pallet jack to move pallets to work areas
- Keep height of stacks of pallets to less than 1 m in height
- If pallets must be lifted use two workers to lift pallets
- Slide, push, and tip pallets up onto raised conveyors or platforms



Recommendation #2:

Improve work postures for feeding press

Consider the following to improve work postures for workers who manually feed the press:

- Use an adjustable height pallet lift to raise / lower stack of sheets
- Inset pallet lift table into floor to allow high stacks to be lowered below shoulder height
- Train workers to keep lifts below shoulder and above knee height
- Place pallet of sheets 1 m away from press in-feed to force workers to turn and step
- Educate workers about risks to the low back related to material handling and twisting



Recommendation #3:

Improve work postures for unloading press

Consider the following to improve work postures for workers who manually feed the press:

- Use an adjustable height pallet lift to raise / lower pallet when loading with sheets
- Inset pallet lift table into floor to allow worker to keep all lifts below shoulder height
- Install load former units to minimize lifting and need for pallet handling
- Train workers to keep lifts below shoulder and above knee height
- Place loading station/pallet 1 m from press out-feed area to force workers to turn and step
- Educate workers about risks to the low back related to material handling and twisting



Recommendation #4:

Improve work postures for installing die on chase

Consider the following to improve work postures for workers when installing a die on the chase:

- Use an adjustable / tiltable stand to pre-mount the die
- Use minimum number of screws to hold die to plate then rotate plate to vertical
- Use hand activated clamps to hold die to plate then rotate to insert screws
- Consider using pneumatic / rechargeable screwdriver to install screws



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Recommendations cont'd

Recommendation #5:

Reduce grip width when handling sheets

Consider the following to reduce the strain on workers forearms when handling sheets:

- Educate workers about the extra risk / strain associated with using a wide pinch grasp
- Encourage workers to handle a smaller number of sheets at one time
- Use automatic sheet feeders to eliminate manual feeding of press
- Use load formers or automatic stackers to eliminate manual stacking of sheets

Recommendation #6:

Ensure chase mechanisms are maintained

Consider the following to reduce the strain on workers when pulling out or pushing the chase mechanism into the press:

- Ensure that the chase mechanism and related components are in good working condition
- Regularly survey workers to see if force required to pull/push chase is increasing
- Use a minimum number of screws to hold die to plate then rotate plate to vertical

Recommendation #7:

Examine / improve access to area above / under jigs

Consider the following to reduce the need to adopt awkward postures and the likelihood of slips and falls when installing the jigs:

- Examine access to areas to see if openings can be enlarged, obstructions removed, etc.
- Make sure that adequate, well-designed hand holds and steps are provided if workers must climb into areas
- Have workers identify a 'best practice' work method for installing jigs that attempts to minimize awkward postures.

Recommendation #8:

Reduce forces associated with pushing/pulling pallets of sheets

Consider the following to reduce the strain on workers when pulling/pushing pallets of sheets on a manual pallet jack:

- Provide motorized pallet jacks for use when moving pallets of sheets into or from the press
- Ensure that pallet jack wheels are kept in good condition (not cracked, well greased, etc.)
- Ensure that workers are not required to push the pallet jack up and over ridges, bumps
- Keep the floor area where a pallet jack is used free from bumps, holes and cracks

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