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## ERGONOMICS: SAFE USE OF FLAT-BED DIE PRESS

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### Overview

From packaging, labels, and displays to commercial printing, flat-bed die-cutting is used for cutting, creasing, embossing, waste stripping, and blank separating a range of sheet materials, from light papers and carton board, to heavy solid board, plastics, in-mold labels, micro-flutes and most types of corrugated board.

**Staffing:** Usually two workers per crew (one operator, one assistant)

**Shift length:** 8 or 12 hours

**Breaks:** 1 lunch and/or dinner, plus 2 to 3 breaks

**Issues:** Shoulder and lower back strains, hands and wrists

### Operator's primary tasks

1. Set up plate, chase, steel die and jigs on press
2. Ensure quality of output
3. Monitor press when in operation
4. Load or feed sheets of corrugated
5. Push skids of sheets along conveyors to loading area of press

### Risks and recommendations

Identified risk factors for pains and strains, also known as musculoskeletal disorders, include manual handling of pallets, sheets, dies, and work posture. To prevent injury, leading practices include recommendations to improve, reduce, or eliminate manual handling, as well as ensuring a waist to shoulder working height at all times.

#### 1. Risk Factor: Lifting and handling wood and plastic pallets

Handling of wood and plastic pallets at the die cutter (either at the in-feed or out-feed end).

#### Recommendation: Eliminate, reduce, or improve manual handling of pallets

- Reduce weight of pallet
- Have a two-person lift policy
- Ensure waist and shoulder working height
- Reduce frequency of handling pallets
- Ensure pallets are in a good repair





## 2. Risk Factor: Handling steel dies

Flat steel dies used in the die press are typically stored in a common die storage area in the plant. Workers retrieve dies weighing 10 to 20 kg from storage racks and move them to the die 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.

### Recommendation: Improve work postures for feeding press

- Ensure waist to shoulder working height
- Occupational health and safety training on manual material handling
- Place pallet sheets 1 metre (3 feet) away from the press in-feed (encourage workers to turn and step)
- Reduce the weight of the die

## 3. Risk Factor: Pushing and pulling of pallets

Pallets of sheets are delivered to the die press via roller conveyors or pallet jacks. If conveyors or pallet jacks are not powered, then the worker must manually push the pallets into position to feed the die press. Some die presses have systems for automatically stacking processed sheets, in which case the worker may have to manually pull or push a full pallet of processed sheets from machine to storage area.

### Recommendation: Improve work postures for unloading press

- Ensure waist to shoulder working height
- Place loading station/pallet sheets 1 metre (3 feet) away from the press out-feed (encourage workers to turn and step)
- Educate workers on the risk of lower back injuries
- Install load former units to minimize lifting and need for pallet handling
- Encourage workers to push rather than pull
- Ensure that the condition of the roller conveyor or pallet jack is ideal



## 4. Risk Factor: Mounting and installing die on chase

After a die has been lifted onto the chase, it is fixed by installing screws in the underside of the chase plate, through holes into grommets in the die. This requires awkward work postures; also pulling the chase from or pushing the chase into the die press can require extreme force.

### Recommendation: Improve work postures for installing die on chase

- Reduce the amount of die changes
- Reduce the amount of screws to hold die to plate then rotate to vertical
- Use hand-activated clamps to hold die to plate then rotate to insert screws
- Consider using pneumatic or rechargeable screwdriver to install screws





## LEADING PRACTICES: PAPER, PRINTING AND CONVERTING



### 5. Risk Factor: Mounting and installing jigs

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 jigs from the storage area and bring them to the die press.

#### Recommendation: Reduce grip width when handling sheets

- Encourage workers to handle smaller sheets at a time (reduce wide pinch grip)
- Consider automatic sheet feeders and stackers
- Reduce the weight of the jigs
- Reduce the amount of jig changes



### 6. Risk Factor: Manual palletizing of processed boxes

Many die presses require workers to manually palletize sheets that have been processed. Workers grasp a stack of sheets from out-feed conveyor or rollers, lift or move the sheets, and then stack them onto a pallet.

#### Recommendation: Ensure chase mechanisms are maintained

- Encourage workers to report increase force to push or pull chase
- Reduce the amount of screws to hold a die plate then rotate to vertical
- Reduce the amount of sheets and number of sheet grasp
- Reduce the amount of handling of sheets
- Ensure waist to shoulder working height

### 7. Risk Factor: 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 add to the stack of sheets in the feeder.

#### Recommendation: Examine and improve access to area above and under jigs

- Ensure waist to shoulder working height
- Reduce the weight of the sheets
- Encourage worker to handle smaller sheets at a time (reduce wide pinch grip)
- Ensure well-designed hand holds and steps are provided if workers must climb in areas