



Investigation Guideline

Product: Radial Arm Saws and Miter Saws

Appendix # : 67

Date amended: July 2004

I. Introduction

A. Background Information

Based on the investigations of the incidents occurring between October 1, 2001 and December 31, 2001 which allowed for identification of “unspecified saws”, the Directorate for Epidemiology estimated that there were about 52,000 injuries treated in U.S. hospital emergency rooms associated with stationary saws for the calendar year 2001. About 38,00 injuries (73%) involved table saws, 7,600 injuries (15%) involved miter saws, 4,060 injuries (8%) involved band saws, and 2,300 injuries (4%) involved radial arm saws. Lacerations, amputations, fractures, and avulsions were predominant and accounted for about 48,880 injuries (94%) for the calendar year 2001. Most of the injuries were to fingers. The rate of hospitalization was five percent compared to the average rate of four percent associated with all consumer products reported through the NEISS system.

Hazards associated with these saws involved blade contact, kickback of saw or wood, inadvertent starting, and thrown objects. Some contributing factors appear to be location of the blade off-on switches, blade guard functions, and pinching of material being cut.

B. Product Descriptions

A radial arm saw is a stationary tool with an adjustable blade that slides on a carriage. It is most often used in 2 capacities:

- (1) The stock/cutting material is fixed and a crosscut is made by pulling the blade across the stock.
- (2) The blade is fixed and the stock/cutting material is fed into the blade to make rip cuts.

The operator can swing, tilt, raise, lower the blade and adjust the tool – stock relationship, comparable to hand held saw applications. This type of saw is very versatile, and can be used in several different sawing operations including various forms of crosscutting, ripping, and mitering (Figure 1).

A miter saw is a portable tool that can be bolted down and used as a stationary tool. A pivot arrangement allows an adjustable blade to swing down to cut material. That is why it is often called a “chop” saw. The 3 typical categories of miter saws are:

- (1) Miter saw - makes 90° cuts.
- (2) Compound miter saw – the blade angle is adjustable to make bevel cuts.
- (3) Sliding compound miter saw – like a radial arm saw, the adjustable blade can slide to cut wider widths of wood.

Miter saws are common on construction sites because they are portable, relatively inexpensive, and make accurate cross cuts. The saw can be set for left-or right-hand cuts and most units have automatic stops for the most commonly used positions. The machine can be used to saw materials other than wood. With the proper blade, it can be used to cut metals or plastics (Figure 2).

The number of miter saws in the market has increased and are very popular among non-professional users because they are smaller, easier to use, and cheaper than radial arm saws. Investigating incidents associated with these saws are necessary because these saws are relatively new and CPSC does not have enough historical injury or death data related to the saws.

Figure 1: Radial Arm Saws



Figure 2: Miter Saws



C. Specific Items of Interest

Include all incidents of injury or death involving radial arm saws and miter saws under operating activity. Incidents not to be included would involve those where the saw is not in operation or under maintenance. Provide all information on saw brand, model, age, condition, type of blade, safety features, location of controls/switches and consumer use patterns. Photograph saw, environment, and a reenactment of the victim's position (**without power to the saw**) at the time of the incident. **This guideline was developed to provide general assistance when conducting investigations. If any other pertinent information is discovered, include it.**

D. Headquarters Contacts

Natalie Marcy, EPHA (301) 504-7329
Caroleene Paul, ESME (301) 504-7540

II. Instructions for Collecting Specific Information

A. Synopsis

Provide a complete and concise account of the incident including the product (s) involved, who was injured, what the injury was, where the incident occurred, and the severity of the injury.

B. Description of Incident Environment

- Described sequence of events leading to the incident, including all relevant information on environmental factors, usage of any abuse, and location of saw.
- Detail aspects of lighting, its location and intensity.
- Provide details of access to saw, considering free movement for operator.
- Re-enact the incident scenario (**no power to saw**). Give a complete and concise description of the incident, including events before, and after the incident.

C. Description of Interaction between Injured Person(s) and Product

- Detail information on user's familiarity with the saw, warning labels, and/or instructions of how to use the saw.
- Did the users hold or touch the blade guard with his/her hand when making the cut.

- Probe with general questions to determine the victim's general condition, and determine what was different on the day of the incident. Consider fatigue, lack of attention, hurrying, etc.
- Obtain information on frequency of use, and typical duration of use. Also, state type of sawing most often done.
- Provide details of victim's exact position while performing the task. This should include position of hands, feet, and relation between saw and material being cut.
- Specify how material being cut was fed into the saw. State if saw was being pulled towards victim or pushed away from victim at the time of the incident.
- Give blade angle relative to the material being cut.
- Explain how blade angle was adjusted
- State depth of cut being made. Specify method for depth determination – gauge on the saw, ruler, other.
- Indicate if any problems existed with the material being cut, which may have contributed to the incident sequence (i.e., knots in the wood, board bouncing or shifting, binding, etc.).
- Determine width, length, and type of stock being cut, also if a push stick was used. If a push stick was used, describe how.
- Specify if blade guard or an off-on safety switch was being used at the time of the incident. If not used, state reason. If used, did any safety device malfunction? How?
- Indicate the location of the off-on switch, relative to the location of the blade.
- Determine if saw was left running between tasks, or if it was shut off while preparing for the next task.
- Describe injuries sustained, their severity, treatment required, and prognosis for recovery.
- Give victim's height, weight, age, and general health.
- State if any protective clothing or equipment was used, and what type.

D. Description of Product

- Give complete description of the saw; include brand, model, age, motor (horsepower, amps, and rpms), location and type of controls, and if any repairs were made to the saw. Include brand and type of blade.
- Ask if the blade was changed prior to the incident. Also ask whether all the fasteners were reinstalled correctly during the blade change.
- Pay particular attention to the blade guard, and anti-kickback and spreader devices. Whether they were attached and being used at the time. If not, state reason. If used, state the position of the device and exact movement of mechanism.
- State type of blade used (crosscut, rip, combination, dado, etc.). Also, state number of teeth and diameter of the blade.
- Provide condition of the blade being used: sharp, dull, teeth missing, rust or residue on blade, etc.
- Specify use of carriage and saw locking mechanisms and if they were tightly secured.
- List location and wording of any safety, warnings, caution, or operating labels or information displayed on saw.
- State if the saw came assembled, or had to be assembled. Indicate who assembled the saw.
- Fully described how the saw table and column were supported.
- Fully described the floor or surface under the saw support – was the surface firm and level? Was the saw table fastened to the base or cabinet? Was the base or cabinet on rollers? If so, were the rollers in use such that the base could roll, if it or the material were pushed?

III. Photograph/Diagram of Incident Scene

- Photograph the saw showing front, side, and top views and the support table/bench.
- Provide close-up photos of labels, controls, safety devices, or guards, and off-on switches.

- Have victim pose for a photo (**without power to the saw**) which depicts his/her position, as well as the position of the material being cut, at the time of the incident.
- Include close-up of photo of the blade involved, which shows the type and size of the teeth.

IV. Obtaining samples and documents related to the investigation

- Photocopy the owner's manual and attached it to the report.
- Complete any unanswered questions from the telephone investigation, also verify the responses given (annotate discrepancies on form)
- Obtain all information requested in guideline and attached the guideline to the report.

(DATA RECORD SHEET – Attached)

DATA RECORD SHEET
Investigation Guideline

PRODUCT: Radial Arm Saws and Miter Saws_____

TASK NUMBER _____ INCIDENT DATE _____

1. Describe the saw involved in the incident. Was the saw mounted on a table, a bench, or its own stand.

_____ Mounted on table or bench

_____ Mounted on its own stand

_____ Other, Specify: _____

_____ Don't know

2. About how old is the saw?

3. What is the brand name (manufacturer), model name/number, horsepower of the saw?

4. Had the saw been changed or modified in anyway since you got it? How was it changed or modified? Who did it?

5. Was the motor running at the time of the incident? **(Determined if the saw had just been turned "on" or "off")**.

6. Does the blade have safety devices such as a blade guard or an off-on safety switch at the time of the incident?

7. Was the victim actually cutting, about to start cutting, at the end of a cutting operation, pausing during a cutting operation, at the time of the accident?

8. How long had the victim been working with the saw that day before the incident occurred?

9. What was the victim cutting at the time of the incident?

10. What type of cutting was the victim performing at the time of the incident? Had the victim been cutting the length of the material, cutting the width of the material, or cutting the material at an angle, or cutting the material in some other way?

11. Does the victim use a different type of blade for different types of cutting operations?

12. What type of blade was being used at the time of the incident? Was it a crosscut blade, rip blade, combination blade, a dado blade, or metal cutting blade (please specify)?

13. What was the diameter of the saw blade (in inches)?

14. What was the condition of the blade at the time of the incident? Was it sharp, dull, had teeth missing or something else?

15. Was the blade guard attached to the saw at the time of the incident?

16. At the time of the incident, did the blade guard function properly? (**Whether the guard returned quickly to its normal position or was slow to return and hung up**).

17. Did the victim hold the blade guard in any way (e.g. to move it up to accommodate thickness of stock) when making the cut?

18. Did the victim or someone else change the saw blade prior to the incident? Were all fasteners reinstalled correctly?

19. What was the shape of stock/material being cut? (e.g. rectangular, square, molding, stick, metal rod,...).

20. What was the length, width, and thickness of stock/material being cut?

21. What was the condition of stock/material?

22. Describe how stock/material was supported?

23. Did the whole surface of stock/material fit on table or did it extend beyond?

24. Was a fence used to guide the stock/material?

25. Was the stock/material held securely against the fence during the cutting operation or was it wobbling or shifting?

26. Was there an anti-kickback and spreader assembly attached to the saw at the time of the incident? Was it resting on the stock/material, or was it above the stock (not touching stock)?

27. Was there an electric brake on the saw at the time of the accident? Did it stop the saw properly and quickly?

28. Was the victim pushing or pulling the stock or was the victim pushing, pulling, lifting, or lowering the arm of the saw at the time of the incident?

29. Please describe the position of the victim's left and right hands with respect to the saw and stock/material, just before the accident, and right at the time of the accident.

30. On the average, how many hours and minutes each time did the victim spend operating the saw?

31. During the last year, what operation has the victim performed most frequently with the saw: crosscutting, ripping, mitering, beveling, combination, or other (please specify)?

32. Does the victim have an owner's manual for the saw involved in the incident?

33. Was the saw assembled when purchased or did the victim have to assemble it him/her self?
