



## **X-Ray Diffraction / Fluorescence General Safety Checklist**

### **Machine Identification:**

Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_  
Principal  
Investigator: \_\_\_\_\_ Telephone: \_\_\_\_\_

### **General Safety Regulations:**

1. Diffraction/fluorescence units may only be operated by Radiation Safety Services (RSS) authorized personnel. All authorized personnel must receive instruction in and demonstrate an understanding of the operation of the machine before starting unsupervised work.
2. An operational fail-safe light is visible to the operator indicating when x-rays are being produced.
3. Use interlocks, barriers or administrative controls to ensure no one can gain access to the primary beam or high scatter radiation areas.
4. Use a calibrated thin-window GM survey meter to verify shielding effectiveness and monitor radiation levels.
5. If the machine is modified, obtain RSS authorization before using the equipment.
6. Whole body and finger ring dosimetry is required for all personnel working with diffraction/fluorescence units.
7. Do not use the safety interlock to turn the machine off; use the main switch.
8. Do not override the safety interlock unless there is a RSS approved written procedure.
9. Make sure the machine is OFF before changing samples or the primary tube safety shutter is closed and verify there is not active beam present; always check the current and voltage meters and/or use a survey meter to detect x-rays.
10. Do not operate with removed covers, shielding materials, or tube housings; or with modified shutters, collimators or beam-stops. Verify that the tube is off and remains off until the machine is completely reassembled and any modifications have been approved. Use the main switch to shut the machine off; do not rely on the safety interlock.
11. Check radiation scatter with a survey meter after each realignment. Notify RSS immediately if there are unusually high readings.
12. Secure unused ports to prevent accidental exposures.
13. Secure diffraction/fluorescence against unauthorized use by using a unit key control or the room lock. Stop the primary beam by secured shielding that cannot be readily displaced.
14. Maintain an operating log that includes date, operator, beam voltage and current, and time on and off (or total exposure time) for each unit use.
15. Notify RSS immediately if there is a real or perceived abnormal personnel radiation exposure.
16. Obtain approval for any location changes, purchase or removal of diffraction/fluorescence units from RSS. Notify RSS prior to the acquisition, disposal, or transfer of any diffraction/fluorescence unit.
17. Contact RSS for information regarding radiation safety or radiation survey instrumentation. A copy of the Massachusetts Radiation Control Regulations is available at RSS.

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### **Laboratory Safety**

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