Eye Strain Prevention for CNC Operators

1.0 Objective & Intent

The objective of this SOP is to establish mandatory ergonomic and administrative controls to prevent eye strain, visual fatigue, and associated musculoskeletal discomfort among CNC operators. Prolonged exposure to screen glare, fine detail work, and poor lighting in cabinet and millwork manufacturing environments can lead to headaches, blurred vision, and reduced situational awareness, increasing the risk of injury. This procedure aligns with WorkSafeBC requirements for ergonomic risk assessment and control (OHS Regulation Part 4.47) and aims to protect operator health and maintain production quality.

2.0 Operational Scope

This procedure applies to all CNC operators, setup technicians, and maintenance personnel who work with or near CNC routers, edgebanders, and nesting machines within the cabinet and millwork facility. It covers all shifts and any task requiring sustained visual focus on control screens, tool path displays, or workpiece details for periods exceeding 15 continuous minutes. This SOP does not apply to administrative staff or personnel not directly involved with CNC operations.

3.0 Hazard Identification & Mandatory PPE

- Eye Strain Hazard: Prolonged screen focus without breaks causes ciliary muscle fatigue, leading to headaches and reduced blink rate.
- Glare Hazard: Reflections from overhead lights or windows on CNC control screens create visual discomfort and misreading of tool coordinates.
- Fine Particulate Hazard: Airborne wood dust and MDF particles can cause eye irritation, prompting squinting and increased strain.
- Mandatory PPE: CSA-approved safety glasses with anti-fog and anti-scratch coating (Z94.3 compliant) must be worn at all times on the production floor.
- Optional but Recommended: Blue-light filtering glasses for operators spending more than 2 hours per shift on digital screens.
- Mandatory PPE: Full-face shield when performing tool changes or cleaning near the spindle to protect against debris and coolant splash.

4.0 Required Safety Equipment & Tools

- Adjustable task lighting with dimmable LED (minimum 500 lux at work surface) to reduce contrast between screen and surroundings.
- Anti-glare screen filter sized to fit the CNC control monitor (matte finish, 25° viewing angle reduction).
- Ergonomic chair with adjustable lumbar support and armrests to maintain proper viewing distance (50-70 cm from eyes to screen).
- Timer or software-based break reminder system (e.g., SafeDesk digital checklist or standalone app) set for 20-minute intervals.
- Lens cleaning station with anti-static wipes and approved cleaning solution for safety glasses and screen filters.
- Humidifier in the CNC cell (target 40-60% relative humidity) to reduce dry eye symptoms from low-humidity environments.

5.0 Step-by-Step Safety Procedure

1. Before starting the CNC control station, adjust the overhead lighting and close any blinds or curtains to eliminate direct glare on the screen. Position the monitor perpendicular to windows and overhead light sources.
2. Clean the CNC control screen and anti-glare filter using approved anti-static wipes. Remove any dust or smudges that could cause visual distortion.
3. Adjust the chair height so that your eyes are level with the top of the monitor screen. Maintain a viewing distance of 50-70 cm (arm's length) from the screen.
4. Set the screen brightness to match the ambient light level (typically 250-300 cd/m²) and increase font size in the CNC software to at least 12pt to reduce squinting.
5. Apply the 20-20-20 rule: every 20 minutes, look away from the screen at an object at least 20 feet (6 meters) away for 20 seconds. Use a timer or SafeDesk reminder to enforce this break.
6. During the 20-second break, consciously blink fully 5-10 times to re-wet the eyes and relax the ciliary muscles. Avoid rubbing eyes with gloved or dirty hands.
7. If performing setup or inspection tasks requiring close visual focus on the workpiece (e.g., checking edgeband alignment), use the adjustable task light directed at the work surface, not at the screen.
8. Report any persistent symptoms (headaches, blurred vision, dry eyes) to the supervisor immediately. Do not continue operating if vision is impaired. The operator must complete a SafeDesk incident report and be reassigned to non-screen tasks for the remainder of the shift.
9. At the end of the shift, clean safety glasses with approved wipes and store them in a protective case. Wipe down the anti-glare filter and screen with a dry microfiber cloth.
10. Document any ergonomic adjustments made (chair height, screen angle, lighting changes) in the SafeDesk digital log for continuous improvement review.