



HAZARD ALERT

Failures of a Pressure – Sensitive Safety Mat Results in a Fatality

*Preliminary
Report*

An hourly production tire-builder died one week after he sustained serious injuries from being caught-in a modified “Super 90” Tire Assembly Machine (TAM). The worker was found unconscious between the tire-building drum and the pneumatic “innerliner/nov” server trays with a hand-stitcher in his left hand. Post-incident, the TAM was tested in various modes and operations to recreate the incident. During these tests, it became obvious the safety mat failed to work correctly. The mat is intended to prevent movement of the server trays when a worker is standing on the mat. The front half of the mat (closest to the TAM’s foot pedals) failed to sense the presence of a worker, especially in the upper left front quadrant. The rear half of the mat functioned properly and stopped the server trays from moving forward to the building drum. The mat is approximately 30”x19½”. Research and information gathering continues to seek the manufacturer’s name, model/serial number and date of manufacture. The mat was neither anchored to the floor, nor sufficient in size to protect workers. There was no visual means such as red and green indicator lights to indicate whether the mat was detecting the presence of a worker. This made it impossible for workers to know if it was operating properly. State OSHA also said the mat was not adequate because, “there was no safety interface controller/safety interface module (failsafe) installed with the mat that would prevent the machine from working if there was a problem/failure with the mat.”



Recommendations to Prevent Recurrence:

- A hazard identification and interactive risk assessment/reduction process must be established per the International Labour Organization (ILO) Code of Practice, Safety and Health in the Use of Machinery, ANSI B11.0 Safety of Machinery, General Requirements and Risk Assessment and ANSI B11.19 Performance Criteria for Safeguarding. These documents can be used for new, modified and rebuilt machines.
- Where safety mats are present, they must be installed, used, maintained per the manufacturer’s recommendations and ANSI B11.19. This includes such things as; anchoring, size of the safety mat(s) and the calculation of the safety distance so that the effective sensing surface prevents individuals from reaching the hazards during the hazardous portion of the machine cycle, a safety interface controller/safety interface module (failsafe) to monitor for open circuits or physical damage, visible red/green indicator lights to indicate the safety mat is detecting the presence of individuals on its sensing surface, documented procedures/records are posted for periodic testing and inspections.
- One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as point-of-operation, ingoing nip-points, rotating parts...see OSHA’s §1910.212.
- In most instances, safety mats alone do not provide a degree of protection deemed necessary to meet the intent of OSHA's regulations. Therefore, redundant guarding is desirable and on occasion necessary to achieve reliable safeguarding of employees from hazardous machine components. The application of safety mats has generally been to provide such redundant safeguarding. Often safety mats are used in conjunction with light curtains. Light curtains are self checking and will shut down a machine if they fail.
- Effective training and procedures for inspecting and testing of safety mats must be part of the program as well as maintaining skilled maintenance staffing levels.



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The information provided in this alert is based on preliminary data only and does not represent final determinations pertaining to the nature of the incident or conclusions regarding the cause of this event.