

MATERIALS HANDLING -- AN ERGONOMIC VIEW

Ergonomics, or human factors engineering, has been a priority issue for OSHA lately. Although no new standard has been developed, OSHA unveiled a four-pronged comprehensive plan to reduce ergonomic injuries on April 5, 2002:

- **Guidelines:** OSHA is to develop industry and task-specific guidelines to reduce and prevent ergonomic injuries
- **Enforcement:** OSHA will continue to cite employers under the General Duty clause for not providing employees with a safe workplace free from recognized hazards
- **Outreach and Assistance:** OSHA is to develop tools to help reduce and prevent ergonomic injuries. Specialized training and information on guidelines are to be provided as well.
- **Ergonomics Research:** OSHA will be encouraging research in this area.

Stay tuned for efforts on this initiative. Check OSHA's homepage, www.OSHA.gov, with its "Ergonomics" area for new developments. In the meantime, the following information may prove helpful in developing your ergonomics program.

Back injuries and cumulative trauma disorders are considered some of the nation's leading workplace safety problems. Manufacturing in the composites industry is labor-intensive so many ergonomic risk factors are present:

- excessive repetition/prolonged activities (roll-out; cutting fabric)
- forceful exertions, usually with hands (releasing parts; moving molds)
- awkward postures of upper body (gel coating; laminating)
- excessive bending or twisting (mold preparation; lay-up)
- prolonged static postures of body (standing in finishing area)
- vibration from power tools (grinding; buffing)

Administrative Controls can be implemented to reduce some of the exposure:

- strength testing of existing workers so that they will not be assigned to jobs that exceed their strength capabilities
- training employees to use lifting techniques which place minimum stress on the lower back
- physical conditioning or stretching programs to reduce the risk of muscle strain
- limiting overtime or the duration of a task
- job rotation or increasing the scope of the job for variations of movement

Engineering Controls are attempts to redesign jobs so that there are fewer exposures:

- a reduction in size or weight of object being lifted
- adjusting height or position of a work station or work piece to avoid twisting and bending
- use of hoists or lifting devices whenever possible
- vibrations of tools minimized
- ergonomically improved grips on tools

Training and Education: OSHA recommends using a formal training program to reduce materials handling hazards. Instructors should be well-versed in matters that pertain to safety engineering and materials handling and storing. The content of the training should emphasize those factors that will contribute to reducing workplace hazards including the following:

- Alerting the employee to the dangers of lifting without proper training.
- Showing the employee how to avoid unnecessary physical stress and strain.
- Teaching workers to become aware of what they can comfortably handle without undue strain.
- Instructing workers on the proper use of equipment.
- Teaching workers to recognize potential hazards and how to prevent or correct them.

Because of the high incidence of back injuries, safe lifting techniques for manual lifting should be demonstrated and practiced at the work site by supervisors as well as by employees.

A training program to teach proper lifting techniques should cover the following topics:

- Awareness of the health risks to improper lifting — citing organizational case histories.
- Knowledge of the basic anatomy of the spine, the muscles, and the joints of the trunk, and the contributions of intra-abdominal pressure while lifting.
- Awareness of individual body strengths and weaknesses—determining one's own lifting capacity.
- Recognition of the physical factors that might contribute to an accident, and how to avoid the unexpected.
- Use of safe lifting postures and timing for smooth, easy lifting and the ability to minimize the load-moment effects.
- Use of handling aids such as stages, platforms, or steps, trestles, shoulder pads, handles, and wheels.
- Knowledge of body responses—warning signals—to be aware of when lifting.

A campaign using posters to draw attention to the need to do something about potential accidents, including lifting and back injuries, is one way to increase awareness of safe work practices and techniques. The plant medical staff and a team of instructors should conduct regular tours of the site to look for potential hazards and allow input from workers.

If news on OSHA's latest developments is needed, please call the Composites One's Department of Health, Safety & Environment at 800/621-8003.

HOIST AND CRANE SAFETY

Hoist and crane safety was one of OSHA's designated priorities announced in 1996. However, no new information has been forthcoming. Presently, there is only a crane standard which was issued in 1971. Fabricators should ensure that at least the minimums of the existing standard are being followed.

ANSI Safety Code for Overhead and Gantry Cranes states design specifications which must be met by any cranes which have been constructed and installed after 1971.

Rated load markings must be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist must have its rated load marked on it.

A minimum clearance of 3 inches overhead and 2 inches laterally must be provided.

Fire extinguishers must be provided and operators must know how to use them.

Only designated personnel may be permitted to operate cranes.

Frequent inspections (considered daily to monthly intervals) must be made. All deficiencies must be examined to determine whether they constitute a safety hazard:

- all functional operating mechanisms must be inspected *daily* for maladjustments
- deterioration or leakage in lines, tanks, valves and other parts of air or hydraulic systems must be inspected *daily*
- hooks with deformation or cracks must be visually inspected *daily*. Monthly inspections must be made with a certification including date of inspection, signature of the person who performed the inspection and identifier for the hook inspected
- hoists must be visually inspected *daily*, including end connections, for excessive wear, twist, distorted links or stretch. Monthly inspections must be made with a certification as described above
- all ropes must be thoroughly inspected monthly with a certification as described above

Periodic inspections (considered 1 to 12 month intervals) must be made. The time frame will be dependent upon its activity, severity of service and the environment. All deficiencies must be examined to determine whether they constitute a safety hazard:

- deformed, cracked or corroded members
- loose bolts or rivets
- cracked or worn sheaves and drums
- excessive wear on brake system parts
- gasoline, diesel, electric or other powerplants for improper performance
- excessive wear of chain drive sprockets and chain stretch
- electrical apparatus for signs of deterioration

Cranes which are not in regular use must be given an inspection before being placed in service. Standby cranes must be inspected at least twice a year.

A preventive maintenance program based on the manufacturer's recommendations must be established.

POWERED INDUSTRIAL TRUCK TRAINING

OSHA issued a new standard effective March 1, 1999 since the previous standard did not define the type of training or authorization required. The training provisions are now addressed much more thoroughly. It is recommended that you visit www.osha.gov/SLTC/poweredindustrialtrucks/index.html for more information on control, compliance and training as well as connections to other related technical links.

Training program implementation:

- Only trained drivers who have successfully completed a training program are allowed to operate truck (except for training purposes)
- Training shall consist of a combination of formal instruction, practical training and evaluation of the operator's performance in the workplace
- Training and evaluation shall be conducted by persons with the knowledge, training and experience to train operators and evaluate their competence

Training program content:

Truck related topics

- Operating instructions, warning and precautions for the types of trucks the operator will be authorized to operate
- Differences between the truck and the automobile
- Truck controls and instrumentation location, what they do and how they work
- Engine or motor operation
- Steering and maneuvering
- Visibility
- Fork and attachment adaptation, operation and use limitations
- Vehicle capacity
- Vehicle stability
- Vehicle inspection and maintenance that the operator will be required to perform
- Refueling and/or charging and recharging batteries
- Operating limitation
- Any other operating instructions, warnings or precautions listed in operator's manual

Workplace related topics

- Surface conditions where vehicle will be operated
- Composition of loads to be carried and load stability
- Load manipulation, stacking and unstacking
- Pedestrian traffic in area where the vehicle will be operated
- Narrow aisles and other restricted places of operation
- Operating in hazardous classified locations
- Operating the truck on ramps and other sloped surfaces that could affect its stability
- Other hazardous environmental conditions that may exist in the workplace
- Operating vehicle in closed environments and other areas where insufficient ventilation

could cause buildup of carbon monoxide or diesel exhaust

The requirements of the OSHA standard on powered industrial trucks must also be included in the initial operator training program.

Evaluation and refresher training: An evaluation of the performance of each powered industrial truck operator must be conducted at least once every three years. Refreshers are to be provided when:

- The operator has been observed to operate the vehicle in an unsafe manner
- The operator has been involved in an accident or near-miss incident
- The operator has received an evaluation that reveals that he is not operating the truck safely
- The operator is assigned to drive a different type of truck, or
- A condition in the workplace changes in a manner that could affect safe operation of the truck

Avoidance of duplicative training: If an operator has previously received training on the topics listed above, and such training is relevant to the working conditions encountered, additional training on that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

Certification: The employer must certify that each operator has received training, has been evaluated and has demonstrated competency in the performance of the operator's duties. Certification must contain the operator's name, date of training, date of evaluation and identity of the person(s) performing the training or evaluation. Training materials and course outline must be maintained.

If you would like a copy of OSHA's Rule on Powered Industrial Truck Operator Training or additional training information, please contact Composites One's Department of Health, Safety & Environment at 800/621-8003.