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Protection Update

is the newsletter for the International Safety Equipment Association's road construction outreach program. It is intended for anyone who specifies, purchases or uses personal protective equipment, and those who regulate it. Protection Update is published every two months and distributed without charge, and also is available on ISEA's website — www.safetysafetyequipment.org.

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ISEA

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ANSI/ISEA Standard Offers Increased Visibility to Workers

By Gary Pearson
3M Personal Safety Products

Transportation department employees face the hazards of working in a roadway environment, some of which can be fatal. The threat of being hit by a car is a constant danger. This risk increases at dawn, dusk or in inclement weather – when the visibility of these workers is often compromised.

Fred Rasmussen, safety administrator of the Louisiana Department of Transportation and Development (DOTD) placed a high importance on obtaining high-visibility garments for his employees. Thanks to his efforts, Louisiana became the first state DOT in the nation to purchase safety vests that comply with the ANSI/ISEA 107-1999 American National Standard for High-Visibility Safety Apparel.

According to Rasmussen, a 3M visibility demonstration allowed him to compare his department's current vests with the ANSI/ISEA-compliant vests under both low light and nighttime conditions. For Rasmussen, the importance of 360-degree visibility was evident. "Our old vests had an eight-inch piece of elastic on each side, so

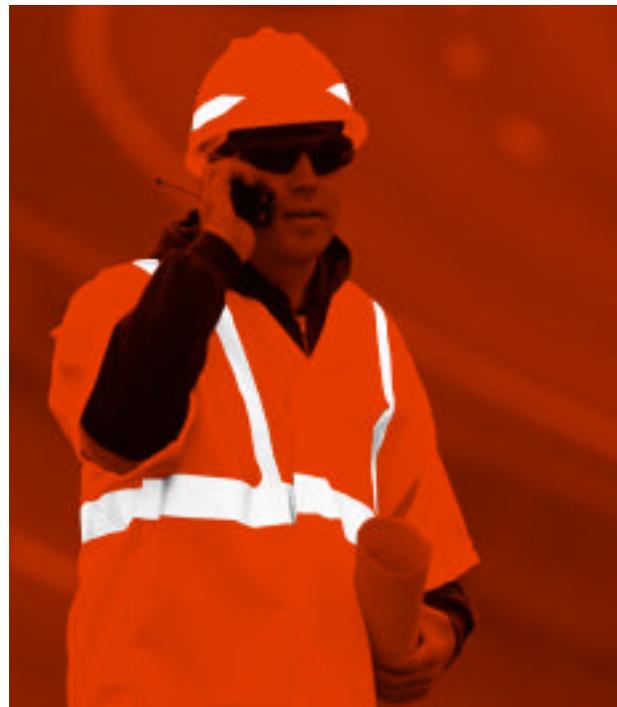
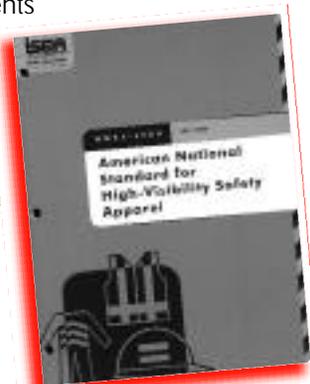


PHOTO BY SKIP BROWN

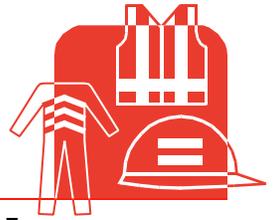
when the worker turned sideways he was no longer visible," explained Rasmussen. "The ANSI-compliant vest assures the worker is visible from all angles."

The process of adopting the ANSI/ISEA standard took time, said Rasmussen, noting that he "worked with a number of different parties to obtain the necessary approvals and develop new safety vest specifications. My number one priority was to improve employee visibility and safety. With that comes meeting the national ANSI standards. Beyond this, there are several other factors that come into play."

Rasmussen considered comfort and sought out garments that were sized to fit each employee, as proper fit is essential to reducing machinery hazards. In addition, those who work in the hot Louisiana sun especially value breathability and weight of the fabric. Six years ago, Louisiana became the first state to adopt lime green safety vests, so vest color was also key. ▶ 2



WHAT'S NEW IN SAFETY EQUIPMENT

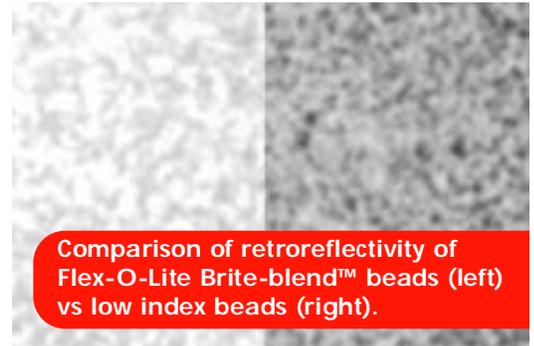


Editor's Note: Each issue of Protection Update will feature innovations in safety equipment. For information on companies listed below that provide visibility-related products, visit the Buyer's Guide on www.safetysafetyequipment.org.)

Visibility-Related Products

Higher-reflectivity pavement markings, and fabric to make cooler apparel for hot weather are two of the newest innovations in visibility-related products from ISEA member companies.

In the past, performance pavement marking has been limited to an oversized glass bead that requires inclement weather to offer a reflectivity advantage. Now there is another option that combines high- and low-index glass beads blended to fit users' needs. These custom blends give superior



Comparison of retroreflectivity of Flex-O-Lite Brite-blend™ beads (left) vs low index beads (right).

IMAGE COURTESY FLEXO-LITE

ISEA's manufacturers of high-visibility products are:

- American Allsafe Company
- Ansell Protective Clothing
- Avery Dennison Corporation
- Buckingham Manufacturing Company, Inc.
- Bullard
- Carhartt, Inc.
- Carolina Safety Sport International LLC
- Dalloz Safety
- DBI/SALA
- ERB Industries, Inc.
- Fibre-Metal Products Company
- Gemtor, Inc.
- HeadLites Corporation
- Iron Horse Safety Specialties
- Jackson Products, Inc.
- 3M Company
- MSA
- M.L. Kishigo Manufacturing Co.
- North Safety Products
- Protecta International, Inc.
- Reflexite Americas, Inc.
- Safe Reflections Inc.
- Services & Materials Company
- I. Spiewak & Sons
- Twitchell Corporation

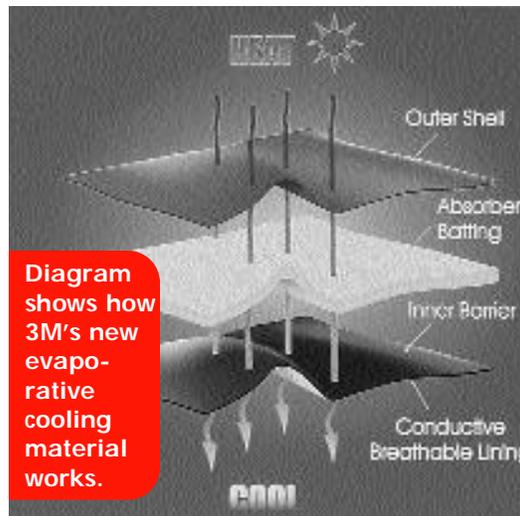


Diagram shows how 3M's new evaporative cooling material works.

IMAGE COURTESY 3M

variable retroreflectivity, increased wet recovery, and ease of application, with no special equipment required. (Visit Flex-O-Lite, www.flexolite.com, regarding Brite-Blend®.)

Those who work outside in hot weather may complain about having to cover up with high-visibility apparel that meets the ANSI/ISEA standard. Now a new "evaporative cooling material" used in such garments can keep those working in temperatures above 90°F cool for up to eight hours, thereby increasing productivity, reducing heat-stress risk, and protecting against radiant heat exposure. The material uses the cooling power of evaporation to reduce body temperature. (Contact 3M Personal Safety Products, ecole1@mmm.com.) ●

ANSI/ISEA STANDARD

continued from cover

"In a work-zone setting employees in orange vests blend right in with the cones and equipment," Rasmussen said. "A lime-green vest sets the worker apart from his surroundings." He added that he "wanted the best reflectivity our money could buy."

According to Rasmussen, the ANSI/ISEA-compliant vests cost the department between \$8 and \$9 more per vest than the garments the DOT was previously using. However, he believes that this extra cost is justified because of the importance of protecting workers.

Rasmussen's employees are now outfitted in ANSI/ISEA-compliant apparel. But his

work is far from done. While Louisiana was the first state DOT to adopt the ANSI-standard, Rasmussen expects others to follow in his footsteps. In fact, Louisiana DOTD has already shared its specifications with other states for both lime green color and reflectivity.

Rasmussen's next project is to write specifications for and purchase rainwear that also meets the ANSI/ISEA standard. Stay tuned. ●

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Head Protection

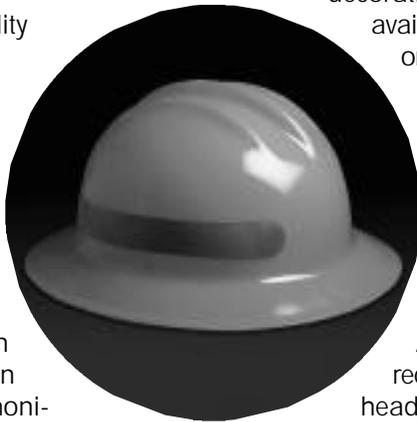
Can Enhance Worker Visibility, and Protect Against Struck-By Injuries

By Kristin Bacon
Bullard

Hardhats are one of the most recognized pieces of safety equipment on any work site. They are required for worker protection, but have you thought of using a hardhat to increase worker visibility? There are many hardhat options available today that can help make road workers more visible to oncoming traffic and fellow workers.

Hi-Visibility Colors

One option is a high-visibility shell color to help increase daytime worker visibility. The most common "high-viz" color available is orange. However, with the need to have workers stand out from safety barrels and signs that are typically orange, other colors are gaining attention and demand, such as green and yellow. Be careful to monitor high-visibility hardhat color stability during prolonged daylight exposure. Replace caps as soon as fading is evident to ensure continued worker visibility and safety.



Reflective Striping

Striping on a hardhat is many times thought of as decoration or for identifying worker differentiation. You can make your cap look great as well as provide enhanced worker visibility, day or night, with striping that is reflective and/or fluorescent in color. The brightness of a stripe is measured as CPL (candelas/lux/square meter). The higher the CPL number, the better the retro-reflectance of the stripe.

Different stripe materials and colors can range from 10-30 CPL, such as blue, red, green, and black (these would be considered decorative), to 175 CPL, which is available in a reflective/fluorescent orange and yellow, to 500 CPL, which is available as highly reflective silver. 360-degree reflectivity can be achieved by adding striping completely around the brim of your cap as well as on the top.

Currently there is no ANSI standard or OSHA requirement for high-visibility head protection. However, turning the typical "required" hardhat into a piece of PPE that also enhances the visibility of the worker is well worth the benefits and easy to do. ●

Bridge Accident Emphasizes Fall Protection's Value

The importance of protecting bridge workers from falls came tragically to light when a fatal accident occurred last

November 14 at Ambassador Bridge, which spans the Detroit River between Detroit and Windsor, Ontario. The accident, which killed one bridge painter, showed that wearing fall protection can change workers' and their family's lives forever.

Seven bridge painters fell when the scaffold on which they were standing collapsed. Four of the painters were suspended ▶6

ABOUT THE AUTHOR

Kristin Bacon is industrial safety product manager for Bullard, a Cynthia, Ky.-based manufacturer of hardhats and other safety products for the construction industry. Bullard is an ISEA member company. Ms. Bacon may be contacted at 859-234-6611 or kristin_bacon@bullard.com.

Safety-Equipment-Related Violations are High on OSHA Citations List

Fiscal year 1999 proved to be expensive for some in the construction industry as the U.S. Occupational Safety and Health Administration (OSHA) levied more than \$40 million worth of penalties for failure to comply with construction safety and health standards.

Violations related to personal protective equipment (PPE) accounted for six of the top 25 construction industry citation categories, and resulted in fines totaling \$9.1 million, with fall protection (three standards), head protection, respiratory protection, and eye-and-face protection all on OSHA's "watch" list.

OSHA cited more than 6,000 fall-protection violations, resulting in \$7.96 million in fines. Head-protection violations accounted for almost three-quarters of the remaining PPE-related citations.

Work Zone Safety: It's A Cultural Thing



Front-line supervisors can set the "cultural" tone for work zone safety.

PHOTO COURTESY 3M

By Ken Myers, Ph.D.
HeadLites Corporation

ABOUT THE AUTHOR
Ken Myers is vice president and senior staff scientist with HeadLites Corporation, St. Paul, Minn., which manufactures enhanced-visibility apparel. HeadLites is an ISEA member company. Dr. Myers may be contacted at (800) 777-5630 or km@headlitescorp.com.

As a road construction industry executive, manager or supervisor, you're likely aware of the considerable financial liabilities and other penalties resulting from accidents occurring where work zone safety is faulted. In addition, perhaps you have a personal commitment to worker safety. If either has stimulated a determined organizational push for work zone safety compliance that met with surprisingly limited success, probably the "culture thing" got you.

Organizational culture, now one of the factors the National Transportation Safety Board, among others, investigates at accident sites, can be simply stated as "the way things are done around here." Building a "culture of safety" is perhaps one of the toughest things a highway construction organization ever will attempt. Sometimes rational, always challenging, cultural change can mean influencing opinion and behavior from top to bottom.

Laboring to make work zone safety an everyday habit in your organization, **from the top down**, consider these general "change rules" for your action checklist:

- It's hard to convince anyone of a "safety culture shift" without actual, visible top management commitment and funding.
- Safety has to be a priority with key man-

agers, on par with other "compensated" priorities, or it gets squeezed out.

- Culture change means re-education and reshaping the reward system top to bottom. You don't pick up fresh habits or shed old ones without new knowledge...and new consequences.
- Policy, training and organizational action guidelines need to spell out specific safety requirements, in simple terms.
- Communicate, communicate and communicate about the safety commitment and expected new/continuing behavior.
- Unionized? Get union leadership into the picture early. Work zone safety is a good place to build/re-build positive working relationships for the long haul.

Beyond these general guidelines, also consider working **from bottom up** as a necessity for creating safer work zones.

Front-line supervisors, the "leaders of 10" who are physically in the work zone, are the real trendsetters of culture..."how things are done around here!" Get these vital change-makers to make it happen in the field by:

- Communicating and educating as to what is required, why it is critical to the company's welfare, and what is in it for them. Key managers also might consider routinely visiting work zones, discussing/praising safety compliance with front-line supervisors.
- Holding them accountable.
- Rewarding for sustained positive action.
- Creating distinctive work wear which both signifies their supervisory position and models state-of-the-art work zone safety gear.
- Incorporating working field supervisors into existing safety structures and activities.
- Creating/reconstituting a supervisory safety council and empowering it to act.

Working safer is working smarter. An organizational culture that pays only lip service to work zone safety increasingly runs the risk of habitual regulatory inspections, jobsite shut-downs and varying degrees of financial and other penalties, plus growing legal staffs to handle what may become routine visits from plaintiff's attorneys...all about as much fun as root-canal procedures. ●

BOTTOM-LINE BENEFIT

High-Visibility Apparel

Bottom-line Benefit in Road Construction

Road construction companies pay out some \$65 million more for visibility-related injuries than it would cost them to equip all of their visibility-hazard-exposed workers with high-visibility apparel. That is the bottom line for road construction companies, according to figures compiled from the U.S. Bureau of Labor Statistics (BLS), the National Safety Council (NSC), American Road and Transportation Builders Association (ARTBA), and ISEA.

How so? Start with 574,000 hazard-exposed road construction workers in the private sector (ARTBA). Apply a 20% high-visibility apparel usage rate among road construction workers (ISEA estimate), meaning that 80% (459,200) are not wearing high-visibility apparel. Multiply that number of workers by the cost each year to equip each worker with two \$25 high-visibility garments (\$50), giving a total cost of \$22.96 million to equip with high-visibility apparel all remaining road construction workers.

Now multiply the total number of annual visibility-related injuries in road construction, which is about 2,500 (based on conservative extrapolations from BLS data), by the



PHOTO BY SKIP BROWN | PHOTO MONTAGE BY SAM FERRO

\$35,300 cost per non-fatal motor-vehicle injury (NSC), yielding a total cost for visibility-related injuries in road construction of \$88.25 million. Subtract the \$22.96 million cost of equipping all unprotected workers from that figure to derive the \$65 million more that road construction companies pay out each year for visibility-related injuries.

“Wearing high-visibility apparel will not protect against every potential visibility-related injury or fatality, and we are not suggesting that it would,” said ISEA President Dan Shipp. “But this data does suggest that road construction companies are spending a whole lot more to cover the costs of visibility-related injuries each year than they would pay to equip their workers properly and make sure they are wearing their high-visibility apparel.” For details on the statistical basis of this cost-benefit analysis, contact ISEA’s Joe Walker, (703) 525-1695 or jwalker@safetysafetyequipment.org. ●

Editor’s Note: This is the second in a series of PPE cost-benefit profiles that will appear in Protection Update; look for future profiles on eye/face, hand, respiratory, hearing and fall protection.

New ISEA Guide to High-Visibility Apparel

International Safety Equipment Association has published a new pocket guide of information on how the construction industry can obtain the latest in high-visibility apparel and accessories to meet the needs of workers in various visibility situations.

Products to Keep You Visible Day or Night – In Any Light explains ANSI/ISEA 107-1999 American National Standard for High-Visibility Safety Apparel, answers the most commonly asked questions about the standard, lists various types of high-visibility products (accessories, coveralls/jumpsuits, fall-protection harnesses, headwear, jackets/outerwear, pants, traffic safety products/warning devices/flags, and vests) and the ISEA member companies that make them, and it provides contact information for those companies.

The booklet may be ordered without charge by contacting ISEA’s Sabra Flaherty, 703-525-1695 or sflaherty@safetysafetyequipment.org. A fully interactive online version of the high-visibility apparel guide, with links to manufacturers websites, soon will be posted on ISEA’s website, www.safetysafetyequipment.org. ●



SAFETY EQUIPMENT Works for You

Protection Update will periodically carry stories about how safety equipment has prevented construction worker injuries or contributed to construction companies' bottom lines.



Watch Out for Passing Trucks

Mary, who works for the Oklahoma Highway Department, was in a state truck when a passing tractor-trailer's mirror hit the one on her truck. Shattered glass burst into the cab of the state truck. But Mary was wearing safety glasses. While she was cut on the face and neck, Mary's glasses stayed in place. Her doctors said that her eyes were well protected and that she could have lost her eyesight if not wearing the safety glasses (from H.L. Bouton Company, www.hlbouton.com.)



Vern, an employee of a Troy, N.Y., construction company, was sweeping debris from a road construction project when the side-view mirror of a passing truck struck him on the head. Vern was wearing a hardhat. "The doctor at the emergency room said the hardhat, which split in two, took the impact and saved Vern's life," reported the company's safety director. (Hardhat from Mine Safety Appliances Company, www.msanet.com.)

Keeping Your Head...And Your Life



A highway worker was securing a load of poles, tightening the load binder when the chain broke releasing the bar that hit him squarely on the head. Fortunately, he was wearing a hardhat, which absorbed the impact and cracked down the center. "The worker's neck took some of the shock but not the potentially deadly blow he would have received to the unprotected skull," wrote the worker's training and safety administrator. (Hardhat from Bullard, www.bullard.com.)

- An overhead crane worker was struck on the head by a 25-pound trolley controller as he worked on a Virginia Power project. The controller fell 10 feet before hitting the worker, but his hardhat protected him from a serious injury even though the impact far exceeded the hat's designed capacity. A few stitches were all that was needed to get the worker back on the job. (Hardhat from Mine Safety Appliances Company.)
- A 12-foot piece of 3-inch metal pipe weighting 100 pounds fell from a pole, striking a worker on the head. The worker, who was on the ground with his back to the pole, was dazed and sustained a laceration on the neck and bruises to the body from being knocked down. "If not wearing a hardhat, the injuries could have been fatal," wrote his safety director. (Hardhat from Bullard) ●

**Visit ISEA,
Members at
the World of
Concrete**

Road constructors can obtain the latest information on safety equipment and standards when they visit ISEA and its members at the World of Concrete, Feb. 27 through March 2 at the Las Vegas Convention Center. Come visit ISEA's booth in the lobby for an update on the road construction outreach program and a list of all ISEA members who are exhibiting at the show. They will be delighted to show you the latest in high-quality products and technologies to create a safer road construction work zone.

BRIDGE ACCIDENT

continued from page 3

from the bridge in safety harnesses, while three plunged into the water. Two of the three survived, but the third has been missing since the accident.

The accident occurred on the Ontario side of the international border. Fall-protection harnesses are mandatory for bridge work under Ontario's Occupational Health and Safety Act. Proper procedure is for workers to hook the safety harness to a lifeline or bridge cable. As the investigation continues, one of the painters left dangling after the scaffold collapse said he was not sure if those who hit the water were hooked on, according to the Detroit Free Press (11/16/00).

The Windsor Star reported (11/15/00) that the scaffold had been moved a day earlier to its position near the Canadian side of the bridge for the final week of the two-year project. At that point, the construction company had a safety conference to remind workers of the precautions to be taken on a new section of the bridge, the Windsor Star said (11/17/00).

Part of the investigation centers on whether or not the painters all were wearing fall protection, said Ontario Ministry of Labor representative Moir McIntyre, adding that "proper safety precautions have to be taken and fall arrest is one of them." The outcome of the investigation will help determine whether the contractor could be subject to fines and other possible penalties. ●