American Foundry Society
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VIA EMAIL - rs@dir.ca.gov

Dear Ms. Neidhardt:

On behalf of the American Foundry Society (AFS), thank you for the opportunity to review and provide comments on the California Division of Occupational Safety and Health's (DOSH) proposal for *Heat Illness Prevention in Indoor Places of Employment.*

By way of background, AFS is the major trade and technical association for the North American metalcasting industry. Our association is comprised of more than 8,000 members representing nearly 2,000 metalcasting firms, their suppliers, and customers. The American metalcasting industry provides employment for over 200,000 men and women directly and supports thousands of other jobs indirectly. There are over 100 metalcasting facilities in the state of California providing good paying jobs for thousands of employees. The majority of these metalcasters are small businesses.

Foundries produce metal castings that are integral to virtually all U.S. manufacturing activities. In the U.S., castings are used to produce 90 percent of all manufactured durable goods and nearly all manufacturing machinery. The industry is composed of 1,935 facilities manufacturing castings made from iron, steel, and aluminum alloys that have thousands of applications. Countless sectors rely upon the existence of castings, including those related to agriculture, aerospace, automotive, construction, defense, energy exploration and conversion, municipal/water infrastructure, transportation, rail, medical devices, renewable energy, sporting goods, and other sectors vital to our economic growth and national security.

Comments

AFS' member companies recognize that their workers are their most valuable asset and place the highest priority on the safety and well-being of their employees. AFS has had procedures in place for effective management of heat related illness risk stress, which are included in the longstanding Foundry Health & Safety Guide. Our comments developed below concerning DOSH's draft proposal for *Heat Illness Prevention in Indoor Places of Employment* dated January 29, 2019 are based on our experiences within the foundry.

The proposed rule, whose goal is "to control the risk of occurrence of heat illness" (a) (4), uses enforcement of environmental conditions (e.g., temperature, heat stress index) as an enforceable method to control the risk of heat illness. This is contrary to the guidance provided by the American

Conference of Governmental Industrial Hygienists (ACGIH) in its manual Industrial Ventilation Manual of Recommended Practice for Design, 29th Edition[1].

Section 4.12 of that ACGIH Manual describes the relationship between heat stress and heat strain as follows: "Heat stress is defined by environmental measurements of air temperature, humidity, airflow rate, the level of radiant heat exchange and evaluation of a person's metabolic heat production rate from exercise and /or work. Heat strain is defined as the cost of to each person facing heat stress. Although all people working at the same intensity in the same environment face the same level of heat stress, each is under a unique level of heat strain. Because disabilities, danger and death arise directly from heat strain, no measure of heat stress is a reliable indicator of a particular person's heat strain, or the safety of the exposure."

In Section 1.2 of the AFS guidance manual "Establishing a Foundry Heat Stress Management Program" (Published under the logos of AFS and OSHA Alliance in 2012), the fundamental premise is that heat disorders are preventable. "Heat disorders are preceded by early warning signs. Workers who are properly prepared for hot work activity can be trained to recognize these physical signs and to immediately take appropriate actions that will prevent heat strain from becoming excessive."

All of the categories defined in the proposed standard to be considered for protecting workers against heat strain should be considered by places of employment. In addition, places of employment should respond to all situations where employees report what they have been trained to recognize as the physical signs of heat strain. However, the singular focus on temperature and heat stress index is not appropriate.

(B) Temperature or heat index measurements – Page 6

Heat stress is much more complex than temperature or heat index. The ACGIH TLV[2] is based on the wet bulb globe temperature (WBGT) which takes air movement into account. The TLV guidance values also account for physical activity and recognize the contribution of worker acclimatization to heat stress.

The state of Minnesota heat stress rule[3] also uses the WBGT and considers work load in its guidance. Moreover, the National Institute for Occupational Safety and Health (NIOSH) recommended heat standard[4] is also based on the WBGT.

Using temperature or heat index is too simplistic and not based on real risk of disease. In addition to the factors mentioned above, there are other factors that contribute to an employee's ability to respond to heat stress. Some of these factors include personal factors, such as not eating or poor wellness habits. Such factors need to be managed as part of a heat illness prevention program but cannot be addressed by engineering controls. The WBGT temperature is clearly a more relevant measure of heat risk than temperature or heat index.

If California is to require substantial expenditures for heat control, the rule should be based on

[1] Industrial Ventilation: A Manual of Recommended Practice for Design, 29th Edition, American Conference of https://www.acgih.org/forms/store/ProductFormPublic/industrial-.

[2] American Conference of Governmental Industrial Hygienists [2016]. Heat Stress and Heat Strain Threshold Limit Value, 2016 Threshold Limit Values and Biological Exposure Indices.

[3] Minnesota Administrative Rules - Part 5205.0110 - Indoor Ventilation and Temperature in Places Of Employment

[4] National Institute for Occupational Safety and Health (NIOSH) [2016]. NIOSH Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments

accurate indicators of risk. The proposed rule requires monitoring both temperature and heat index. The references to "whichever is greater" in (e)(1) and (e)(1)(D)1 imply a requirement for both ambient temperature and heat index calculation. Foundries have tried to track heat index over time to correlate it with other measures but have found that tracking the heat index was ineffective because it was not meaningfully related to heat risk.

Feasibility is Undefined and Vague

The proposed rule requires the employer to demonstrate infeasibility in numerous places [(d)(1); (e)(2)(A); (e)(2)(A)1; (e)(2)(A)2; (e)(2)(B); (e)(2)(C)]. Nowhere is feasibility defined, nor is how the infeasibility is to be "demonstrated", or to whom. Such vagueness fails to provide adequate notice of what is required and leads to potentially arbitrary enforcement. Many feasibility disputes between OSHA and foundries have involved millions of dollars and multiple years without resolution. Without a defined "end point" an enforcement agency has no guidance or incentive to accept an employer's demonstration of infeasibility. Controls are layered upon controls, year after year, without ever reaching agency acceptance.

Infeasibility of controls should be defined as meeting any of the following tests:

- Not being capable of providing meaningful reduction of risk
- Impairing quality (reducing ability to market the product)
- Impairing performance ability (interfering with ability to produce the product)
- Requiring unacceptable cost that adversely impacts a business' ability to survive (1% of gross revenue, or 10% of profit)

Proposal Mandates Air Conditioning

As currently proposed the rule requires controlling heat to 82 degrees where there is radiant heat load. Radiant heat loads are inherent where there is molten metal or work involving hot castings. Ambient air conditions often exceed 82 degrees in California. Weather records show the average high in Los Angeles exceeds 82 degrees in July, August and September. On average, there are 113 days over 80 degrees in Los Angeles and 21 over 90. In Sacramento, there are 66 days per year over 80 degrees and 11 over 90.

The assessment requirements in (e)(2) require using the highest reading, not the average. In Sacramento, that would require basing control requirements on the 11 days over 90 degrees and assuming the same temperatures applied throughout the year.

Mandatory engineering controls essentially requires installing air conditioning in such situations. Air conditioning is not a sustainable solution for foundries. Many foundries, particularly in warm climates or seasons, operate with open walls to increase air flow and minimize temperature. This also has a ventilation effect for dust and fume exposure. Air conditioning would require closing the walls in. That could reduce air movement and increase dust exposure levels. Moreover, many of the ventilation systems that foundries depend upon for control of dust and fumes require vast amounts of air flow. Huge energy consumption would be required to condition the replacement air for those systems to try to maintain temperatures within allowable limits.

AFS believes there are alternative ways to address heat stress. Foundries are no strangers to heat and heat risk, and foundries have developed programs for the effective management of heat related illness risk. These programs present a comprehensive and balanced approach to managing heat stress with the following elements:

- **Training and Self-Monitoring** - Heat disorders are preceded by early warning signs and workers who are properly prepared for hot work activity can be trained to recognize these physical signs.

- **Personal Protective Equipment (PPE)** – PPE provides important safeguards for workplaces, but certain types of PPE can add to heat load. On the other hand, other types of PPE, such as air supplied hoods for eye, face and respiratory protection, can provide thermal comfort and protection from heat related illness. An improvement to the rule would be to allow companies to move directly to heat relief PPE (for example, the use of cooling suits or air supplied hoods with a cooling vortex on the air supply), without having to determine feasibility through engineering controls. These forms of heat relief PPE are widely used, have a great deal of employee acceptance, are reliable and cost effective. Use of the cooling suits should exempt employers from the temperature monitoring and recordkeeping provisions.

- **Medical Management and Supervision** – Due to their health state and physical condition, not all workers are capable of performing hot work activities in a safe and healthy manner. Medical management can help with proper assignments. A close working relationship with supervision is important for recognition and intervention.

- **Management of Work Activity** – Preventing heat disorders involves managing work activity to assure heat strain is controlled. Management of work activity requires a combination of engineering, administrative and work practice controls to maintain health and hydration and offset heat effects. Acclimatization, work demand reduction, rotation, heat relief areas, fans, misting devices, shields and water access are all important.

While many of these program elements are included in the proposed rule, there must be a balanced and flexible application of these features, not a singular focus on engineering controls. The proposed rule contains an overwhelming emphasis on engineering controls, as the primary control until feasible resources are exhausted. Without further definition or clarification, this approach dictates use of air conditioning, which is unnecessary, expensive, and energy intensive.

Conclusion

AFS appreciates the opportunity to provide comments on the heat illness prevention proposal. Should you have any questions, do not hesitate to contact me or Stephanie Salmon, AFS Washington representative, ssalmon@afsinc.org.

Sincerely,

Doug Kurkul
CEO
American Foundry Society