

Exercise

Master's degree in environmental science and engineering

Occupational and environmental health

3.2 Physical agents - thermal

1) Hot wash

A workplace in a clothing cleaning company (laundry) has a wet temperature of 32°C and a radiation temperature of 30°C. Calculate the WBGT.

The employee at this workstation is responsible for loading and unloading laundry. She spends about half of her workday doing this activity, with the rest of her time spent on administrative tasks (order entry). She has been with the company for approximately 12 years. Is the WBGT obtained acceptable under these conditions?

2) Merry Christmas

A mechanic working for a ski lift company has to make an urgent repair at the top of a gondola tower (3000 m altitude). He is wearing a warm suit, but his face is partly uncovered. The temperature is -10°C and the wind is 40 km/h. What is the apparent temperature? How much time does he have (in theory) before he risks frostbite?

Can you explain the physical phenomenon that causes the apparent drop in temperature?

3) Stressors and thermal comfort factors

What factors (physical, physiological) contribute to thermal stress or discomfort in the following situations:

- a) A baker makes pretzels in an industrial bakery. He supplies the ovens with dough (10 to 20 kg balls of dough) and supervises the baking process on all ovens (4-5 x per hour).
- b) A miner in a potash mine maintains and monitors the network of belt conveyors coming from different workings (850 m deep). He has to ensure the alignment of the conveyors at all times.
- c) A worker is scraping flocking from the ceiling of an office space. The asbestos-containing plastering is being scraped in full protective suit and respiratory protection mask.