

Occupational Safety in Breweries

HAZARDS IN DAILY WORK ROUTINE | Brewers seem to be blessed with a sturdy health. This is no surprise as the endless change of climate zones between fermenting hall/storage cellar and brew-house toughens up the human organism. But this is not as simple as it sounds: a brewery involves a multitude of hazards, from scalding to frostbites up until death by asphyxiation due to inhalation of carbon dioxide. In this article, the significance of occupational safety in general and the hazards in the daily work routine in particular are dealt with and recommendations are given to help brewers to keep safe.

OCCUPATIONAL SAFETY in breweries is everyone's business. And everyone should take it seriously. The owner of the brewery or the technical manager assigned, i.e. the master brewer, is responsible for complying with occupational safety. In practically all countries around the globe, severe penalties can be imposed for violations of occupational safety rules. Employees also have to comply with the rules of occupational safety. In case of violation, they have to expect disciplinary actions by the management up until dismissal and, in the case of an accident, restrictions in social benefits. It is thus a foregone conclusion that this topic should not be taken lightly. Hazards in breweries can generally be categorised as follows:

- hazards due to thermal influences (heat, cold);
- hazards due to chemicals (acids, caustics, cleaning agents);



- hazards due to gases (ammonia, CO₂, nitrogen);
- hazards due to mechanical influences (bruising, blows);
- hazards due to falling or tumbling (ladders, slipping);
- hazards due to noise.

Naturally, many other hazards are lurking in the background though the ones listed above are the most common ones in breweries.

Main Hazards in Daily Work Routine

Hazards Due to Heat and cold

Beer is boiled in breweries, thus heating takes place. The whole hot section, i.e. the brewhouse, constitutes the largest hazard potential. Operators may suffer burns and

scalding when touching hot surfaces (e.g. uninsulated steam pipes or heat exchangers), but also from wort boiling over and contact with hot spent grains during spent grain removal.

Hot surfaces should be insulated as far as possible. If this is not possible, they should be cordoned off and marked as hot surfaces. Special hazard symbols exist that should be affixed such as to be clearly visible. When handling hot materials (wort, spent grains), appropriate protective equipment should be made available, e.g. insulating gloves with long cuffs, water-impermeable aprons and appropriate face protection.

Cold presents also a hazard in breweries. On the one hand, due to the refrigeration plant that is installed in practically all breweries. When touching uninsulated pipes, the risk of frostbites exists. On the other hand, due to carbon dioxide used in breweries; this is stored as liquefied gas in bottles or tanks and is vaporised when used. During vaporisation, the gas cools down to such an extent that massive frostbites may be suffered when unprotected skin comes into contact with the gas. Like heat hazards, the same safety recommendations – insulation, cordoning off, marking and wearing protective equipment – apply.

Hazard Due to Chemicals

A multitude of various chemicals are found in breweries, most of them are used for cleaning and disinfection. It is important that chemicals are stored properly to avoid any leakage, either unintentionally or negligently. Employees should also receive intensive training in handling chemicals, in particular in terms of the hazards that chemicals may pose. When handling chemicals, appropriate personal protective equipment should be worn without any exception. This comprises appropriate footwear (e.g. rubber boots resistant to chemicals), apron, gloves and eye protection or, better still, face protection. In some instances, breathing protection might also be required.

Author: Dr. Gerrit Blümelhuber, MBA, Doemens Academy GmbH, Gräfelfing, Germany

Special attention has to be given to the fact that chemicals should never be mixed with other chemicals as highly toxic gases may develop that can entail sustained health impairment.

Hazard Due to Gases

Ammonia is frequently used as a refrigerant in refrigeration units. Employees should receive targeted training to learn how to behave when a perceivable smell of ammonia is noted in the operation, pointing to a leak. Appropriate protective equipment should be at hand (total face mask).

Carbon dioxide is a much more frequent source of hazards and accidents. On the one hand, carbon dioxide formed during fermentation and, on the other hand, handling CO₂ in bottles and tanks for dispensing or handling beer are sources of hazard. In fermenting halls, CO₂ warning systems should be installed, the alarm units should be located outside the fermenting halls so that staff can be aware of critical CO₂ concentrations in the rooms before entering them. Staff should also receive regular training, making them aware of possible hazards posed by carbon dioxide.

Hazards Due to Mechanical Influences

They arise in particular in filling as most equipment has movable components that in some instance rotate rapidly. It is a foregone conclusion that these parts should be covered, but equipment exists into which staff could reach and access these movable components, theoretically without any major problems. Appropriate barriers and safeguards should be in place. Another hazard should not be underestimated: appropriate clothing should be worn and long hair should be tied back so that it cannot be drawn into fast running equipment, lead-

ing to scalping injuries. Jewellery such as rings and necklaces are also a no-go as it can cause massive injuries when worn while operating fast running equipment. But also outside the filling equipment, many hazards due to mechanical influences are lurking. In a moment of inattention, fingers can be squeezed or even severed when handling manholes with covers as commonly installed e.g. on brewing and mashing vessels. Measures to remove such hazard points are technically feasible in most instances. Employee sensitisation i.e. regular training is recommended.

Hazard Due to Falling or Tumbling

Especially in areas in breweries where floors are wet or moist, there is an increased risk of slipping. This risk is even accentuated because rubber boots with rubber soles are usually worn in these areas. Appropriate flooring should be assured. Unsuitable flooring is often laid in breweries, such as tiles intended for households. When moist, they are usually extremely slippery. Care should be taken to lay only suitable non-slip flooring withstanding moisture. Footgear should have anti-slip soles; this is rather rare when buying inexpensive rubber boots.

Falling hazards in breweries usually arise from the use of ladders or working platforms frequently found e.g. in smaller brewhouses. Ladders should always have a secure footing. Better still if they can be suspended as is frequently the case on tanks. These ladders cannot topple over when used. When climbing ladders, appropriate footgear should be worn because wet soles or ill-fitting shoes may frequently lead to slipping down. When installing working platforms, railings should be fitted in any case that are sufficiently high to prevent

falling down. Unfortunately, railing is frequently used that is too low for aesthetic reasons. Railings should have an additional intermediate support so that it is not possible to slip down under the railing.

Hazard Due to Noise

At a glance, noise hazards seem to be a trifle exaggerated though they account for an alarmingly high percentage of occupational diseases registered. There are many potential noise sources in breweries. The main culprit is filling, in particular when glass containers are filled. Many sources of noise are also found in other sections, e.g. in the compressed air station, in the boiler house, on refrigeration compressors and also when pumps are incorrectly installed, to name but a few.

The main objective should, naturally, be noise abatement. In the filling room, baffle ceilings can be installed. Compressors can be enclosed or encapsulated. Pumps should be installed without cavitating. Not only does this lower the noise level, it also considerably prolongs the lifetime of pumps.

After having taken measures for reducing noise, noise levels can remain a health hazard in some sections. The only solution: personal protective equipment. From simple earplugs to so-called “Mickey Mice” that protect the whole ear, various hearing protectors are commercially available. It is vital that the employer makes them available to his staff and ensures that they are worn.

Occupational safety is an essential part of operating a brewery. Everyone involved has to be aware of the fact that this does not simply boil down to complying with legal regulations, but that it is a matter of assuring health and, ultimately, performance of staff. ■