

How to avoid accidents by selecting correct safety distances

The safety aspect is important within every industry or business. But it may be hard to be aware of all dangers and hazards present in a working environment. One of these is to ensure people stay at correct distances from machines and other hazardous areas. Here are some useful tips on how to improve your workplace and calculate the right safety distances.

When working at construction sites or in similar environments it is necessary to be aware of the many different safety aspects and standards that are required. How high should my fences be? What distances do I need to consider? How do I create the safest possible working environment for my employees?

Axelent's safety expert Matthias Schulz says there are two pitfalls companies need to be aware of.

1. Do not think "this will not happen, people would not be that careless" – human error can always occur.
2. Do not think that a warning will be sufficient. People get used to warnings and will eventually ignore them deliberately or unconsciously. Safety should not only rely on people's behavior. Technical safety is the key.

Avoid making common mistakes

Some of the common mistakes companies make is having too low fences around machinery and robots, or in worst cases lacking a fence at all. Frequently, fences are placed too close to hazard zones just to save space, which means someone can reach the hazard. In other cases, particularly in large systems, doors for access may be too far

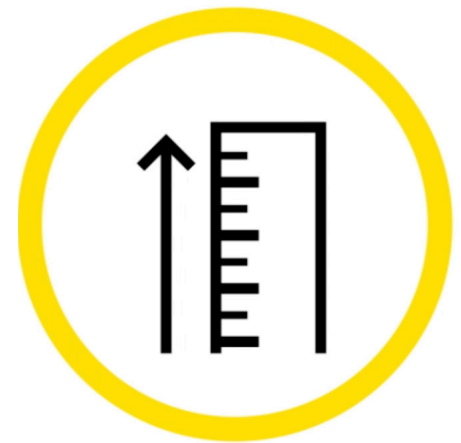
away or too few. Many times, companies do guesswork and do not compute this. If an accident does occur and the engineers have not followed the standards regarding safety, this could lead to both personal injuries, downtime and legal prosecution.

Factors regarding a safe environment include:

- Preventing people from reaching over or underneath barriers. This involves the height of the fence and the gap between the bottom edge of a fence panel and the floor.
- Preventing people from reaching through openings with their hands or fingers. This involves the pitch of mesh used and any gaps remaining between fencing posts and adjacent walls or machine parts.

How to calculate the correct fence height

Personal injury can be avoided by actively working with safety distances and determining the correct height of a safety fence. It is not always possible to eliminate hazards, but there are several ways to reduce the risks and determine the correct measurements of the distances you need. However, one needs exact data concerning the equipment or machinery involved.



To calculate the safety distance correctly, one needs to know and use the right standards. It includes both the position of the fence and its height. If a fence is too low or too close to a hazard, the risk of people getting injured increases.

For example, assume that the height of a robot is 1 600 mm and the shortest horizontal distance between a hazard location on the robot machine and the fence is 600 mm. In this case, the fence height should be at least 2 000 mm. Axelent provides the table chart from EN ISO 13857 to help customers to determine the correct safety distance and fence height.

Standards to consider

There are two important standards to consider regarding safety distance. These are:

EN ISO 13857:2019 (revised)

Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs.

- This standard can be used in both industrial and non-industrial environments and includes people older than 14 years, and to some extent children older than 3 years. It is based on data of the standard size of the human body. Complying with this standard enables designers to eliminate or reduce risks that can be caused by machinery, such as preventing upper and lower limbs getting into hazard zones. Standards regarding safety distance must be applied when designing safeguards.

EN ISO 13854:2019 (EN 394 until 2019)

Safety of machinery - Minimum gaps to avoid crushing of parts of the human body.

- This standard specifies appropriate minimum gaps to prevent crushing when being in hazardous environments. It is only applicable to hazards of crushing, not other potential risks regarding safety of machinery.

