

Floor Scale Safety To Reduce Injury Risk

Assessing risks and eliminating potential workplace hazards can help ensure health and safety. Ergonomically designed floor scales and professional equipment installation reduce the risk of incidents and protect the health and safety of operators.

Occupational health and safety is an absolute priority in the chemical industries. Because the human and economic costs of accidents can be significant, the prevention of lost time incidents (LTI) has become an important performance indicator. Although prevention practices have generally improved, it takes continuous measures not only to maintain existing safety levels, but also to continually reduce the number of LTIs.

As a result, businesses and regulatory bodies scrutinize workplace, equipment and processes for potential hazards and evaluate their risk. When it comes to weighing equipment, proper installation and maintenance, operator training and standard operating procedures are important safety aspects.

When purchasing and installing a floor scale, safety and maintenance personnel can look for several features to ensure ergonomic and safe handling for employees. This white paper provides an overview of floor-scale models and offers practical tips for selecting, installing and operating a floor scale to reduce the risk of injuries and accidents.



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1 Safe work procedures

National regulations such as Occupational Health and Safety Act (OSHA - USA), Health and Safety Executive (HSE – United Kingdom) and the global initiative Responsible Care®, provide guidance on risk assessment and hazard prevention.

Measures to ensure the health and safety of a weighing workplace must consider both long-term health risks from ergonomic setup of a floor scale as well as the risk of accidents. Ergonomic considerations are most important in production areas with many manual weighing processes.

Before installing a floor scale, reviewing the following potential risks and creating an action plan around them may help to increase safety and reduce ergonomic risk for employees:

Topic	Potential Risk
Scale positioning	<ul style="list-style-type: none"> • An incorrectly placed scale may interfere with the operating process and cause accidents and injuries. • Scales placed too far away require unnecessary movement and increase the likelihood of slips, trips and falls. • Without proper electrical installation work-around solutions with long exposed cables increase accident risk. • Inconveniently positioned terminals do not allow fast reading of the results and lead to unnecessary neck movements.
Scale environment	<ul style="list-style-type: none"> • In explosive environments, inappropriate equipment may pose an explosion risk or may be challenging to handle and to maintain due to unwieldy protection methods. • Water ingress may lead to incorrect weighing results and may even cause health risks from electric malfunction if the equipment does not provide appropriate ingress protection (IP).
Scale handling	<ul style="list-style-type: none"> • Incorrect height and position of the floor scale can lead to longer loading procedures and more strenuous work efforts. That can increase the risk of tripping accidents and long-term health issues. • Scales that are not constructed for easy cleaning may contain crevices, sharp angles, rough surfaces or insufficient welding which not only facilitates contamination but also may cause mechanical incidents and injuries. • Liffable deck floor scales without safety features such as build-in gas springs or locking mechanisms can be strenuous to handle and even cause injuries. • Insufficient operator training may cause improper scale handling, leading to accidents and health problems.

2 Hazard prevention

By acknowledging and preventing common hazards, companies can reduce risk of employee injury. The following may help prevent risks when working with floor scales. By designing or modifying work areas to fit the employee, businesses can enhance productivity and reduce accidents.

1. Scale position

Floor scales should be placed within comfortable distance to the weighing goods to avoid employees having to transport them. Ideally, the scale should be easily reached from all work sites. Consider installing the scale close to a wall. This ensures it will not block walkways and allows the terminal to be mounted at an appropriate height for easy reading of weighing results. Power and network cables should be short and securely fitted to prevent tripping accidents.

2. Scale installation

The positioning of weighing platform and terminal should be chosen with ergonomic stressors in mind and should not contribute to extreme postures and/or excessive forces. Ergonomic hazards are prevented by effective design of the workstation, tools and job. In case of a floor-scale installation, different types of installation and scale constructions can be chosen for an ergonomic and safe weighing procedure.



3. Pit installations

A pit installation allows the fastest access to the scale with no need for pushing pallets, carts or goods uphill, reducing the risk of tripping accidents. That solution often is used in high-traffic areas. The scale position is fixed and the location should be well considered. However, floors that are poorly constructed or equipped with a protective sealing may not allow for construction of a pit installation.



4. Easy lifting solutions

Floor scales with a liftable load plate are increasingly used because they are easy to operate and easy to clean. Built-in gas springs enable one person to raise and lower the load plate with minimal effort. During cleaning, the gas springs hold the platform safely in the raised position. Because minimal lifting effort is required, workers can do the job without straining or risk of injury. The scale's gas springs are fully sealed for safe, failure-proof operation. For pit installations, pneumatic cylinders lift the scale and provide access to the pit or ground from the underside of the platform. With this solution, the entire scale tilts up 45 degrees, exposing all surface areas for cleaning. An automatic safety system restrains the platform if pneumatic pressure is lost. The pneumatic controls typically can be locked to prevent unauthorized personnel from operating the system.



5. Installations on the ground

For applications that do not allow a pit installation, perhaps due to a sealed floor, low-profile scales are commonly used. Typically, they are not higher than 45 millimeters above ground and only require minimal force to load with a forklift. They can be equipped with ramps of different lengths for easy access from the front and back of the low-profile scale. Ramps eliminate the need to lift heavy loads, allowing them to be wheeled onto the scale platform safely and easily. However, ramps require more space compared to a pit floor scale. Models offering the capability to lift the load plate also are available for easy cleaning. Tripping risks can be minimized by clearly marking the area where the floor scale is installed.



6. Mobile solutions

Those scales include wheels and can be moved where needed. Instead of using several fixed scales, one movable scale can be used to weigh goods and materials at different places during the production process. That avoids unnecessary movement and workload and reduces the risk of tripping when carrying materials.



7. Slip-resistant surfaces

A smooth stainless-steel surface can be slippery, especially in wet applications. To provide safe footing, consider stainless-steel platforms with slip-resistant surfaces to prevent employee injury. Alternative surfaces such as SlipNOT® and ALGRIP™ provide safe walking areas in wet environments.



3 Weighing terminals

1. Terminal position

Work processes should be designed to reduce static and awkward postures. Choose the placement of the terminal with the goal of providing easy and fast access to relevant weighing data.

2. Terminal placement

Terminal placement is closely aligned with screen-viewing comfort. Where should the terminal be placed? Should the terminal be mounted on a stand beside the floor scale or fixed on the wall? Depending on the work situation, the optimal solution can vary. However, the goal should always be to ensure the terminal is directly in front of and facing the operator to help eliminate unnecessary neck motions. The terminal should also be positioned at a comfortable distance. If figures are difficult to read larger fonts or screen magnification can help reduce operator eyestrain.

3. Displays

Specialized scale features help operators work more accurately and efficiently. For example, if the display is not located directly beside the scale, a screen with large fonts helps employees read the results quickly and easily. An alternative to relying on fast-changing digits or working with small indication lights is using a display screen that changes color to indicate that a target weight has been reached. Or in the case of a filling process, colored dynamic status indicators, such as bar graphs and large fonts, can simplify work flow and reduce human errors. That color change is visible even via peripheral vision, which can help reduce unnecessary head motions during the weighing procedure. Use of high-contrast displays with a wide viewing angle reduce eye strain in poor light conditions and allow for comfortable display reading for people of all sizes.



4 Explosive environments

Accidents in potentially explosive areas can have dramatic consequences not only for the well-being of employees, but also for other companies and residents in the area.

Two primary considerations must be taken into account when choosing the right weighing equipment for areas with explosion risk.

- Floor scale, weighing terminal, peripherals and communication installations must all match the hazardous-area classification as defined by the manufacturer according to local regulations.
- They must also provide an appropriate method of ignition protection.



Installing intrinsically safe weighing equipment is the safest method to protect from explosion hazards. Intrinsically safe systems enable equipment to be used without risk of igniting any flammable gas, dust or fibers that may present in hazardous areas. Compared to other protection methods, such as flame-proof enclosures, intrinsically safe equipment is easy to handle and can be serviced without halting production.

5 Training and maintenance

Regular training and education is needed to ensure that employees are sufficiently informed about the hazards in their work environment. That should enable employees to actively participate in their own protection. Professional and regularly performed scale service not only guarantees accurate results, but also ensures the scale's functionality and safety. Periodic inspections, such as METTLER TOLEDO's Hazardous Area Health Check, provide pro-active maintenance of installed hazardous-area equipment. Only a properly maintained scale delivers precise results and offers maximum protection for the user.



6 Summary

Chemical plants can be dangerous places to work. However, with some foresight and thoughtful planning, companies can maintain safe workplaces while maximizing productivity. Floor scales and other equipment should be chosen and installed with the application and employee in mind. By purchasing a floor scale with certain features, businesses can do their due diligence to ensure employee safety and impact the company's bottom line.



7 Additional references

- OSHA, US Occupational Safety & Health Administration – www.osha.gov
- EU-OSHA, European Agency for Safety and Health at Work – www.osha.europa.eu
- HSE, UK Health and Safety Executive – www.hse.gov.uk
- Responsible Care®, International Council of Chemical Associations – www.icca-chem.org
- SlipNOT®, metal safety flooring – www.slipnot.com
- ALGRIP™ slip resistant flooring products – www.algrip.com
- Hazardous Area Safety Competence Guide, METTLER TOLEDO – www.mt.com/ind-hazguide

www.mt.com/floorscale

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