

Choosing the Right Scale for a Harsh Environment

The Best Scale for Your Environment

There is a high demand for reliability and durability in scales across manufacturing disciplines. Managers often have to balance budgets with equipment attributes when deciding on the proper units to purchase for their processes including: accuracy, repeatability, and weight ranges. Operation in a harsh environment adds one more layer of complexity and cost to the decision making process. Choosing the right scale or balance can be a challenge.

Corrosion to contact surfaces in a harsh environment may reduce the life of the balance, impede cleaning between processes, and reduced accuracy. Environments with a high likelihood of spills or wash down situations & water or chemical contact with load cells beneath the weigh pan may pose 'invisible' damage to your scale. Liquid penetration into or corrosion of the load cells themselves can affect weighing, intermittent scale behavior, increased down time, and more expensive call service.



If your daily weighing operations cause your equipment to come into direct contact with corrosive liquids, gasses, or solids, you will want to specify a scale with appropriate protection. A range of design protections are available and Cross works with several manufacturers to source the right scale for your environment.

What level of exposure will your balance, scale, and indicator experience? We recommend that our customers evaluate their process, process environment, and cleaning conditions to determine the level of protection required for accurate use and long life of your scale. Equipment manufacturers use specific ingress tests to determine how a scale design meets a specific protection level for dust and liquid exposure. 'IP' codes are designed such that as the number increases, a higher level of exclusion or Ingress protection is signified for particles and liquids. The first digit of the IP code relates to solids exclusion and the second digit signifies liquid exclusion. Compare your process environmental demands to the ingress protection standards in the chart below.

IP Rating Code	1 st Digit	Solids	2 nd Digit	Liquids
IP	1	>50 mm Object Prevented - Large Body parts	1	Verticle Dripping water
IP	2	>12 mm Object Prevented - Fingers	2	Angular Dripping water/ 3mm rainfall per min
IP	3	>2.5 mm Object Prevented - Tools	3	60 degree angle - Spraying Water
IP	4	>1 mm Particle Prevented	4	Splashing water - Oscillating spray
IP	5	Dust Ingress protected, not prevented	5	Water Jet - low pressure
IP	6	Complete protection from dust ingress	6	Powerful water jet
			6K	Powerful water jet with increased pressure
			7	Immersion to 1M for 30 min
			8	Immersion to up to 3M - per Manufacturer
			9K	Powerful high temperature water Jets (80°C)

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Top Considerations for component exposure (should be evaluated for the scale body, the load cells, and indicator):

- What chemicals come in contact with components?
- Will the system be washed down with water?
- Specific Cleaning Agents, Caustics, Solvents?
- Will the area be dusty?
- Will the unit be used in an explosive environment?
- What temperature range will it be exposed to?
- Does it need to be lifted for cleaning? Does that need to be automated?
- Do you need to move the unit?

Other considerations for the total cost of scale ownership in a chemical environment relates to the accumulation of service costs. Mild steel load cells may be sufficient in your weighing environment to last a few years before failure, however they may corrode into the structure increasing the service time during replacement. If a one hour load cell replacement turns into a whole day affair due to corrosion/seizure, any money saved over stainless steel, hermetically sealed load cells is lost.

The accumulation of service costs and down time need to be considered in total cost of ownership. We recommend using heavy duty, chemical resistant cables in areas with caustics or acids and implement an inspection routine at regular intervals. Lastly, check any indicator enclosures for deterioration of the rubber seals. A combination of the proper scale specification & inspection routine can reduce your ownership costs, maintain your scale performance, and extend the life of your scale.

References:

IP Chart Source: ANSI/IEC 60529-2004