

The Top 10 Issues to Consider When Specifying an Enclosure for a Harsh Environment

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Choosing an enclosure is typically considered to be an easy task. Review the sizes of the components that are to be enclosed, determine the basic dimensions required, check on the aesthetics, and select the right box. When evaluating the enclosure needs in a harsh environment, the decision becomes more complex and meaningful as the wrong choice can be fatal to the end product. Below is a quick review of 10 issues to consider when selecting an enclosure for use in a more challenging location.

1. How Harsh is Harsh? The selection of protection levels can significantly impact the product choice. For example, NEMA 12, which protects against dripping liquids might work well in a relatively clean factory, but would not be appropriate in an environment where water spray or weather can be a factor when a NEMA 3R or NEMA 4 enclosure would be better choices. On the flip side, choosing too protected of an enclosure can increase costs significantly, threatening the ROI on your product
2. Do all Component need to be protected? Sometimes, only a small percentage of the components are sensitive enough to need protection, so a small NEMA enclosure can be put inside a larger enclosure to save money overall. Given that the raw material is the major driver of the cost of the box, size matters.
3. Does the box need to meet outdoor/UV requirements? If the unit is being used outdoors, does it have the appropriate UV protection to avoid long term damage? Typically, this is an issue with plastic enclosures, but it raises issues of other potential ratings that would need to be met including UL, CE, etc.
4. How will the electronics be vented/cooled? There are NEMA air vents that are available as an accessory, but there are also air conditioners and other cooling methods. The ability to use different methods varies by the materials, as does the potential issues involved. However, it is important to be aware that a sealed enclosure cannot be vented as readily as a typical box.



QUICK GUIDE TO NEMA RATINGS

NEMA 1: Provides protection against incidental contact with the enclosed equipment and against falling dirt. Indoor use only

NEMA 12: Same as NEMA 1 plus provides protection against circulating dust, lint, and dripping and lightly splashing liquids. Indoor use only

NEMA 4: Same as NEMA 12 plus provides protection against rain, sleet, snow, wind blown dust and hose-directed water. Indoor or outdoor use

5. How heavy is the equipment being installed and are there any restrictions to the weight that the overall product can be. Weight restrictions can influence the materials required. For example, heavy components may require a metal enclosure or perhaps one of fiberglass, whereas light weight components can use cost saving plastics.



6. How are the components going to be mounted? Unlike non-hazardous environment boxes, simply drilling holes in the enclosure is not an option. While holes can be gasketed, this is both expensive and can lead to potential leaks. It is better to select an enclosure with standoffs or internal panels that avoid the need to create cutouts. Also, if displays are required, transparent or translucent covers can also save the installing from creating openings for readouts.

7. How is the enclosure going to be mounted? If the unit is wall, pole, or equipment mounted, external brackets are best if they are either molded into the box or attached in a way that does not impact the integrity of the box. It is much harder for the installer to make these decisions in the field and to understand the options than if it is configured properly in advance



8. What are the aesthetics involved. If the product is going on a factory floor, the needs in this area are very different than if it is going in an outdoor home environment. Plastic tends to provide the best look as there is flexibility in design as well as materials, while steel tends to be fairly generic.

9. Price is closely related to aesthetics and materials. Again, since the enclosure price is not typically determined by technology levels, but rather by the core materials, budget constraints tie closely to application. A polycarbonate enclosures is normally going to be less expensive than a steel box, but more expensive than one of ABS.

10. Plan for modifications. A sealed box can most often best be prepared for installation at the factory where proper tools can be used to create the cutouts and adjustments.

There is nothing worse than preparing for an installation and having to stop because the wrong bit or pressure splintered the plastic or dented the steel. Depending on the material involved, even size variations can be implemented as well as accessory installation. Close contact with the distributor and factory will allow for the best solution.



While the technology involved with enclosures is relatively simple, the need to make smart choices remains important. A quick application of the above checklist will insure that the balance between the best protection and the best price will be optimal. And in all situations, remember that Bud is ready to provide assistance at every step of the way.