

Industry Standards

Enclosure Ratings

In order to assist in the selection of an enclosure, rating classifications have been established by the National Electrical Manufacturers Association (NEMA). These ratings identify the ability of the enclosure to provide a degree of protection against incidental contact with the enclosed equipment and protection to the enclosed equipment from environmental elements such as dirt, dust, water and other corrosive agents. Underwriters Laboratories (UL) and the Canadian Standards Association (CSA) are widely recognized testing organizations that perform enclosure product testing to these standards and provide regular follow up service to ensure that manufacturers conform to established product and manufacturing specifications.

These ratings, however, are intended to be used only as a guide. To ensure a proper choice, it is recommended that an assessment of the application and environment be conducted before product selection.

NEMA 1 - Indoor use to provide a degree of protection against falling dirt.

NEMA 2 - Indoor use to provide a degree of protection against limited amounts of falling water and dirt.

NEMA 3 - Indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 3R - Indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet and snow; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 4 - Indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 4X - Indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 6P - Indoor or outdoor use primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

NEMA 12 - Indoor use to provide a degree of protection against falling dirt; circulating dust, lint, fibers and flyings; and dripping and light splashing of liquids.

NEMA 13 - Indoor use to provide a degree of protection against falling dirt; circulating dust, lint, fibers and flyings; and spraying and seepage of water, oil and non-corrosive coolants.

Conformance To Industry Standards

Industrial enclosures manufactured by Allied Moulded Products and bearing the UL and CSA labels have been tested and certified to the following standards:

UL 50.....	Enclosures For Electrical Equipment
UL 50E.....	Enclosures For Electrical Equipment, Environmental Considerations
UL 508A.....	Industrial Control Panels
UL 746C	Polymeric Materials – Use In electrical Equipment Evaluations
CSA-C22 No. 14.....	Industrial Control Equipment
CAN/CSA-C22 No. 94....	Special Purpose Enclosures

Allied Moulded Products enclosures series AMU, AM, AMP and AM-R maximum size 30 x 24 x 10 are certified:

- UL Types 1, 2, 3, 3R, 4, 4X, 12, and 13
- CSA Types 1, 2, 3, 3R, 4, 4X, 12 and 13
- NEMA Types 1, 2, 3, 3R, 4, 4X, 12 and 13

AMP, AM and AM-R JIC flat and raised cover models sizes 14" x 12" x 6" and smaller (excluding AM743 and AM943) and all AMU models utilizing covers secured with four mounting screws (excluding window covers) are UL and CSA listed Type 6P.

Allied Moulded Products enclosures series AM sizes 36 x 30 x 12 and larger are certified:

- UL Types 1, 4, and 4X
- CSA Types 1, 4, and 4X
- NEMA Types 1, 4, and 4X

AM, AMP and AMU series meet IEC60529 Type IP66. Models rated NEMA 6P meet IEC60529 Type IP68 submersible up to 24 hours at a depth of 6 feet (1.8meters)

International Standards IP Protection Classification Data

The first digit character represents the degree of protection against a person's contact with live parts and the protection of the equipment against the ingress of solid foreign bodies. The second digit represents the degree of protection against the ingress of liquids. Both of these values are represented in ascending value with the larger number equaling the greatest protection.

First Digit		Second Digit	
IP	Test	IP	Test
0	No protection	0	No protection
1	Protection against solid bodies larger than 50 mm (for example accidentally touching with the hand)	1	Protection against vertical water drops and condensation
2	Protection against solid bodies larger than 12 mm (for example a finger)	2	Protection against water drops up to 15" from the vertical
3	Protection against solid bodies larger than 2.5 mm (tools, wires)	3	Protected against rain up to 60° from the vertical
4	Protection against solid bodies larger than 1mm (tools, wires)	4	Protected against water splashing from a hose from all directions
5	Protection against dust (no harmful deposits)	5	Protected against water sprayed from a hose from all directions
6	Complete protection against dust	6	Protected against powerful water jets
		7	Protected against the effects of immersion
		8	Protected against effects of prolonged immersion under pressure

General Enclosure Specifying Guidelines

	304 SS	316 SS	Painted CS	Polycarbonate	Compression FRP	Gelcoat FRP	Custom PVC
Cost	4	5	1	2	3	4	4
Weight	5	5	5	2	3	3	2
Impact (flex)	N/A	N/A	N/A	4	3	3	2
Flex Strength (rigidity)	N/A	N/A	N/A	13,000 psi	23,000 psi	33,400 psi	10,500 psi
MFG Process Type	Fabricated sheet	Fabricated sheet	Fabricated sheet	Injection Mold	Compression Mold	Open Mold	Fabricated Sheet
Size Limits	Custom NL	Custom NL	Custom NL	up to 18" Max	up to 36" max	36" up to 90"	Custom NL
Outdoor Corrosion (rating)	NEMA 4	NEMA 4X	NEMA 4	NEMA 4X	NEMA 4X	NEMA 4X	NEMA 4

Note: Those categories containing rating numbers are based on 1 as low and 5 as high.