

## HE Series

(Small Electronic Enclosures/Insulated Industrial Boxes – Except Hinged Boxes)



### Features

- Hidden hinges open 185° for easy access.
- M8x18 screws for back panel mounting (included).
- Sealing gasket on all models.
- Mounting plate available for specific sizes.
- Hinged versions available (factory installed). \*For more information contact your Carlon Sales Representative.
- Optional internal/external hinges.
- Enclosures attach directly or with wall brackets.

### Lid Options



*Opaque low lid. "BASIC" model.*



*Transparent low lid. "C" models.*

### Material

- Opaque – lids and bases - PVC
- Clear – lids and bases - polycarbonate

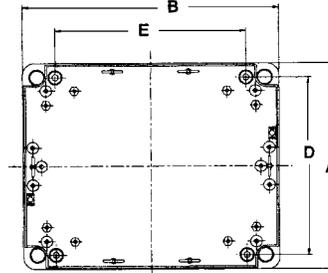
### Standards

- NEMA 4X Rated.
- Meets IP 55.

Carlon® Himeline® HE Series Enclosures are small Electronic Enclosures/Insulated Industrial Boxes ranging in size from 4 x 3 x 2 to 13 x 11 x 4. They have a high-impact, high dielectric resistance, and are lightweight, fully gasketed and suitable for indoor and outdoor applications. The HE Series Enclosures meet IP 55 and are NEMA 4X Rated. All these features combined make these enclosures the ideal alternative to expensive stainless steel enclosures.



Except where noted by ►

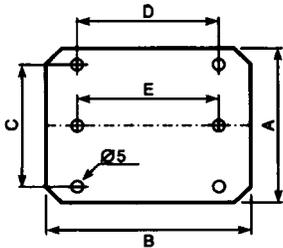


Opaque Cover Assembly	Clear Cover Assembly	Dimensions					Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)	Unit Wt. (lbs.)	Locking Screw Type
		External		Internal						
		A	B	C	D	E				
HE432	HE432C	4.33	2.96	2.29	4.14	2.76	5	1.1	5.2	Stainless Steel
HE443	HE443C	4.14	4.14	2.60	3.90	3.90	6	3.1	7.5	Stainless Steel
HE533	HE533C	5.32	2.92	2.84	5.12	2.72	5	2.4	6.3	Stainless Steel
HE743	HE743C	6.70	4.14	3.23	6.46	3.90	2	1.2	12.4	Polyamide
HE974	HE974C	8.66	6.62	4.18	8.43	6.38	1	1.1	–	Polyamide
HE1194	–	10.63	8.66	4.14	7.48	9.81	1	2.7	–	Polyamide
HE12105	HE1210C	12.33	9.97	4.53	11.82	9.45	1	3.0	–	Polyamide
HE14114	HE1411C	13.78	11.02	4.14	12.92	10.16	1	4.0	–	Polyamide

## Accessories

### Mounting Plates

To be fitted directly into the boxes with self-tapping screws included in the standard supply. Made of zinc coated steel, 1.5 mm thick.



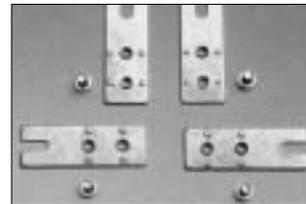
Part Number	Dimensions					Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
	A	B	C	D	E		
EMP743	3.74 (95)	6.15 (156)			5.12 (130)	10	10
EMP974	6.15 (156)	8.07 (205)	5.12 (130)	5.91 (150)		10	8.5
EMP1194	8.19 (208)	10.16 (258)	6.34 (161)	8.70 (221)		10	13
EMP1210	9.26 (235)	11.62 (295)	6.15 (156)	8.51 (216)		5	4.1
EMP1411	9.85 (250)	12.60 (320)	8.27 (210)	9.85 (250)		5	3

### Air Vents\* NEMA 1 Rated only.



Part Numbers	Style	Std. Ctn. Qty.
► HPVM25	For fitting outside of all enclosures	1
► HPVM35	For fitting inside of all enclosures	1

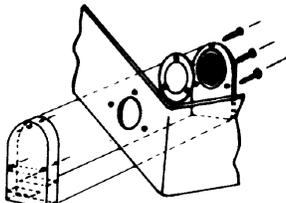
### Wall Mounting Bracket



Part Number	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► HEWMB	1	.35

### Enclosure Ventilator\*

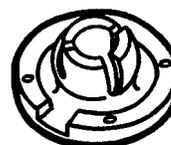
Allows any size enclosure to breathe, yet remains watertight.



Part Number	Std. Ctn. Qty.
► HVM27	1

### Draining Device\*

For 3R Rating and condensation build-up.



Part Number	Std. Ctn. Qty.
► HPVEA9	1

\*Factory installation available.

## For All Enclosures



Painted JIC enclosure with painted back panel. Installed clear cover with handle and quick-release latch.



Color molded JIC unit with addition of window and pushbuttons.



Molded junction box painted with addition of mounted in-use weatherproof cover.



Painted JIC enclosure with pocket installed in cover for control pad.

### Color Molded Enclosures

All Circuit Safe® enclosures can be molded in a variety of colors. Minimum quantities for single shipment or releases against blanket orders are required.

### Painted/Silkscreened Enclosures

All enclosures can be painted, interior and exterior, or by special request. Enclosure covers can also be silkscreened on request.

### EMI/RFI Protection

For applications where Radio Frequency Interference is a factor, the interior can be coated with an acrylic base paint with a nickel filler. Windows can be covered with fine copper mesh.

### Other Modifications Available

Our factory is capable of modifying any of our enclosures to a customer's specifications. Factory's capabilities include:

- Precision milling of button holes, windows, and pockets for keypad installations.
- Hole tapping.
- Ventilators.
- Mounting bosses.
- Access windows.
- Hinged windows.
- Mounted in use weatherproof covers.
- Handles for portable units.
- Latches.
- Enclosure coolers.
- Cylinder locking systems.
- And more!

## NEMA Types – Definitions Pertaining to Nonhazardous Locations

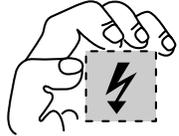
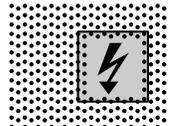
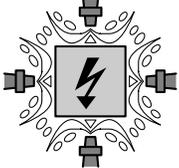
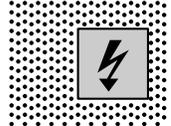
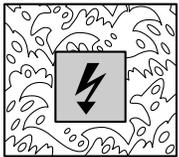
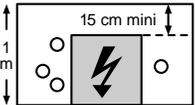
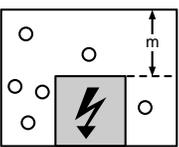
### Enclosures for Electrical Equipment

An enclosure is a surrounding case constructed to provide protection from accidental contact with the enclosed equipment and to provide protection to the enclosed equipment from specified environmental conditions. A brief description of the more common types of enclosures used by the electrical industry follows.

- Type 1 Enclosure:** Intended for indoor use primarily to provide protection against contact with enclosed equipment and a degree of protection against falling dirt.
- Type 2 Enclosure:** Intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.
- Type 3 Enclosure:** Intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, sleet and external ice formation.
- Type 3R Enclosure:** Intended for outdoor use primarily to provide a degree of protection against falling rain, sleet and external ice formation.
- Type 3S Enclosure:** Intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, and sleet, and to provide for operation of external mechanism when ice laden.
- Type 3X Enclosure:** Intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, sleet, external ice formation, and corrosion.
- Type 3SX Enclosure:** Intended for outdoor use primarily to provide a degree of protection against wind-blown dust, rain, sleet, and corrosion, and to provide for operation of external mechanism when ice laden.
- Type 4 Enclosure:** Intended for indoor or outdoor use primarily to provide a degree of protection against wind-blown dust and rain, splashing water and hose-directed water.
- Type 4X Enclosure:** Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, wind-blown dust and rain, splashing water and hose-directed water.
- Type 6 Enclosure:** Intended for indoor or outdoor use primarily to avoid a degree of protection against contact with enclosed equipment, falling dirt, hose-directed water, entry of water during occasional temporary submersion at a limited depth and external ice formation.
- Type 6P Enclosure:** Intended for indoor or outdoor use primarily to provide a degree of protection against contact with enclosed equipment, falling dirt, hose-directed water, entry of water during prolonged submersion at a limited depth and external ice formation.
- Type 12 Enclosure:** Intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.
- Type 13 Enclosure:** Intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and noncorrosive coolant.

## International Standards IP Protection Classification Data

The letters IP followed by three characteristic numbers symbolize the degree of protection.

First Digit		Second Digit	
Protection Against Solid Bodies		Protection Against Liquids	
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 condensation
2	 Protection against solid bodies larger than 12 mm (for example a finger)	2	 Protected against water drops at up to 15° from the vertical
3	 Protection against solid bodies larger than 2.5 mm (tools, wires)	3	 Protected against rain at up to 60° from the vertical
4	 Protection against solid bodies larger than 1 mm (tools, small wires)	4	 $\Delta$ Protected against water splashing from all directions
5	  Protection against dust (no harmful deposits)	5	 $\Delta \Delta$ Protected against water sprayed from a hose from all directions
6	  Complete protection against dust	6	 Protected against water projections similar to sea wave splashes
		7	 Protected against the effector immersion
		8	 $\Delta \Delta \dots m$ Protected against effects of prolonged immersion under pressure

## Clearance Holes For Carflex® Fittings or PVC Male Terminal Adapters

Carflex Fittings & PVC Male Terminal Adapters Trade Sizes	Nominal Size (in.)	Actual Size (in.)	Actual Size (mm)
1/2	.875	.879	22.4
3/4	1.093	1.107	28.2
1	1.344	1.357	34.6
1 1/4	1.813	1.699	43.2
1 1/2	1.938	1.949	49.6
2	2.375	2.413	61.5
2 1/2	2.875	2.914	74.0
3	3.5	3.539	89.8
3 1/2	4	4.044	102.7
4	4.5	4.544	115.4
5	5.625	5.675	143.7

## Engineering Properties Of Enclosures

Property	Test Method	Opaque Polycarbonate Covers & Boxes	Clear Polycarbonate Cover	FRP
<b>Thermal And Mechanical</b>				
Temperature Range (°F)	-	-30° to 230°	-30° to 230°	-58° to 320°
Specific Gravity (oz./in <sup>3</sup> )	ASTM D792	1.20	1.20	1.79
Thermal Conductivity (BTU•in/hr•ft <sup>2</sup> •°F)	ASTM D177	1.35	1.35	1.68
Heat Deflection Temperature @ 264 PSI (°F)	ASTM D648	265	260	392
Tensile Strength (PSI)	ASTM D638	8,800	9,000	13,000
Flexural Strength (PSI)	ASTM D790	13,500	14,000	19,000
Compressive Strength @ 10% Deformation (PSI)	ASTM D695	12,500	12,500	24,000
Impact Strength IZOD Notched (ft.lbs./in.)	ASTM D256	12	12	12
Water Absorption – 24 hrs. @ 73°F (%)	ASTM D570	0.15	0.15	0.17
<b>Electrical</b>				
Dielectric Strength (VOLTS/MIL.)	ASTM D149	380	380	467
Dielectric Constant	ASTM D150			
60 Hz		3.0	3.0	-
100 Hz		-	-	-
106		2.96	2.96	-
Volume Resistivity @ 73°F (OHM-CM)	ASTM D257	>10 <sup>16</sup>	>10 <sup>16</sup>	2.0 x 10 <sup>15</sup>
Arc Resistance (SEC)	ASTM D495	120	120	200+

## Chemical Resistance Data

**Environmental Resistance Table:** E-Excellent, G-Good, L-Limited, U-Unsatisfactory

**IMPORTANT:** These environmental resistance ratings are based upon tests where the specimens were placed in complete submergence in the reagent listed. Ratings listed in this chart apply to a 48-Hour exposure period. (The information in this chart is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility. Before permanent installation, test the equipment with the chemicals and under the specific conditions of your application.)

Chemical	PVC Himeline HE - Opaque Cover w/Base	Polycarbonate Circuit Safe NEMA Circuit Safe JIC Himeline HE - Clear Cover w/Base Himeline HS - Opaque w/Clear Lids	FRP (Fiberglass Reinforced Polyester) Himeline HS - Bases Himeline HP Himeline HLA/HLS Himeline HLP	Noryl Circuit Safe Medium JIC
Acetaldehyde	U	L	-	-
Acetamide	U	U	-	-
Acetate Solvent	U	-	-	U
Acetic Acid	U	G	E	E
Acetic Acid 20%	U	E	E	E
Acetic Acid 80%	L	G	E	E
Acetic Acid, Glacial	U	G	E	E
Acetic Anhydride	U	U	E	U
Acetone	U	U	U	U
Acetyl Bromide	U	-	-	-
Acetyl Chloride (dry)	L	U	-	U
Acetylene	E	U	-	-
Acrylonitrile	G	U	-	-
Adipic Acid	E	-	-	-
Alcohols:Amyl	E	G	-	L
Alcohols:Benzyl	U	-	-	U
Alcohols:Butyl	E	E	-	E
Alcohols:Diacetone	G	-	-	E
Alcohols:Ethyl	L	G	-	E
Alcohols:Hexyl	E	-	-	E
Alcohols:Isobutyl	E	-	-	E
Alcohols:Isopropyl	E	E	-	E
Alcohols:Methyl	E	G	-	E
Alcohols:Octyl	-	-	-	E
Alcohols:Propyl	E	-	-	E
Aluminum Chloride	E	E	E	E
Aluminum Chloride 20%	E	E	-	E
Aluminum Fluoride	E	-	-	E
Aluminum Hydroxide	E	G	-	E
Aluminum Nitrate	G	E	-	-
Aluminum Potassium Sulfate 10%	E	E	-	E
Aluminum Potassium Sulfate 100%	E	E	-	E
Aluminum Sulfate	E	E	E	E
Amines	U	U	-	U
Ammonia 10%	G	U	-	E
Ammonia Nitrate	G	-	-	E
Ammonia, anhydrous	E	U	-	G
Ammonia, liquid	E	U	L	-
Ammonium Acetate	E	-	-	-
Ammonium Bifluoride	E	-	-	E
Ammonium Carbonate	E	-	L	E
Ammonium Caseinate	-	-	-	E
Ammonium Chloride	E	E	E	E
Ammonium Hydroxide	E	U	L	E
Ammonium Nitrate	E	-	L	E
Ammonium Oxalate	E	E	-	-
Ammonium Persulfate	E	-	-	E
Ammonium Phosphate, Dibasic	E	E	-	E
Ammonium Phosphate, Monobasic	E	-	-	E
Ammonium Phosphate, Tribasic	E	-	-	E
Ammonium Sulfate	E	E	E	E
Ammonium Sulfite	E	-	E	E
Amyl Acetate	U	U	L	U
Amyl Alcohol	E	G	L	L
Amyl Chloride	U	-	U	U
Aniline	L	U	U	U
Aniline Hydrochloride	G	U	-	-
Antifreeze	E	-	-	E
Antimony Trichloride	E	E	E	E
Aqua Regia (80% HCl, 20% HNO3)	L	U	-	U

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Aromatic Hydrocarbons	U	-	-	U
Arsenic Acid	E	E	-	E
Arsenic Salts	E	-	-	-
Asphalt	E	U	-	-
Barium Carbonate	E	E	E	E
Barium Chloride	E	E	E	E
Barium Cyanide	U	-	-	-
Barium Hydroxide	E	U	U	E
Barium Nitrate	E	U	-	E
Barium Sulfate	G	U	E	E
Barium Sulfide	E	-	E	E
Beer	E	E	-	E
Beet Sugar Liquids	E	-	-	E
Benzaldehyde	U	U	U	G
Benzene	L	U	L	U
Benzene Sulfonic Acid	E	U	E	E
Benzoic Acid	E	G	-	G
Benzol	-	-	-	G
Benzonitrile	-	E	-	-
Benzyl Chloride	-	-	-	U
Bleaching Liquors	E	-	-	-
Borax (Sodium Borate)	E	-	-	E
Boric Acid	E	-	E	E
Bromine	L	L	-	E
Butadiene	L	U	-	U
Butane	L	U	-	U
Butanol (Butyl Alcohol)	L	G	-	E
Butyl Amine	U	U	-	U
Butyl Ether	E	-	-	U
Butyl Phthalate	-	U	-	E
Butylacetate	U	U	U	G
Butylene	E	U	-	-
Butyric Acid	G	U	-	U
Calcium Bisulfate	-	U	-	-
Calcium Bisulfide	E	-	-	E
Calcium Bisulfite	G	U	-	E
Calcium Carbonate	E	L	E	E
Calcium Chlorate	G	-	E	-
Calcium Chloride	L	-	E	E
Calcium Hydroxide	G	U	U	E
Calcium Hypochlorite	G	U	L	E
Calcium Nitrate	E	E	E	E
Calcium Oxide	G	-	-	E
Calcium Sulfate	G	E	E	E
Calgon	-	-	-	E
Cane Juice	E	-	-	-
Carbolic Acid (Phenol)	U	U	-	U
Carbon Bisulfide	U	-	L	-
Carbon Dioxide (dry)	E	-	-	E
Carbon Dioxide (wet)	E	-	-	E
Carbon Disulfide	U	U	-	E
Carbon Monoxide	E	-	-	U
Carbon Tetrachloride	U	U	E	U
Carbon Tetrachloride (dry)	-	-	-	U
Carbon Tetrachloride (wet)	-	-	-	U
Carbonated Water	E	-	-	E
Carbonic Acid	E	E	-	E
Catsup	E	-	-	E
Chloric Acid	E	-	-	U
Chlorine (dry)	U	-	-	G

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Chlorine Water	E	-	E	L
Chlorine, Anhydrous Liquid	U	L	-	G
Chloroacetic Acid	G	U	-	-
Chlorobenzene (Mono)	U	U	U	U
Chlorobromomethane	U	-	-	-
Chloroform	U	U	-	U
Chlorosulfonic Acid	U	L	-	U
Chocolate Syrup	-	E	-	E
Chromic Acid 10%	E	G	E	E
Chromic Acid 30%	E	L	-	U
Chromic Acid 5%	E	G	-	E
Chromic Acid 50%	U	U	-	U
Chromium Salts	E	-	-	-
Citric Acid	G	E	E	E
Citric Oils	-	-	-	E
Clorox® (Bleach)	E	-	-	E
Copper Chloride	E	-	-	E
Copper Cyanide	E	U	-	E
Copper Fluoborate	E	-	-	-
Copper Nitrate	E	U	-	E
Copper Sulfate >5%	E	E	-	E
Copper Sulfate 5%	E	E	-	E
Cresols	U	U	U	U
Cresylic Acid	U	U	-	-
Cupric Acid	E	E	-	E
Cyclohexane	U	G	-	U
Cyclohexanone	U	U	-	U
Detergents	E	E	-	E
Diacetone Alcohol	U	U	-	-
Dichlorobenzene	U	U	-	-
Dichloroethane	U	U	-	E
Diesel Fuel	E	E	-	U
Diethyl Ether	U	U	-	-
Diethylamine	U	U	-	-
Diethylene Glycol	L	G	-	E
Dimethyl Aniline	U	U	U	U
Dimethyl Formamide	U	U	-	U
Diphenyl Oxide	U	-	-	-
Dyes	G	-	-	E
Epsom Salts (Magnesium Sulfate)	E	E	-	E
Ethane	E	-	-	-
Ethanol	L	G	-	E
Ethanolamine	U	-	-	E
Ether	U	-	L	U
Ethyl Acetate	U	U	L	E
Ethyl Benzoate	U	U	-	E
Ethyl Chloride	U	U	L	U
Ethyl Ether	U	-	U	U
Ethylene Bromide	U	U	-	-
Ethylene Chloride	U	U	-	U
Ethylene Chlorohydrin	U	U	E	-
Ethylene Diamine	U	E	-	U
Ethylene Dichloride	U	U	U	U
Ethylene Glycol	E	G	E	E
Ethylene Oxide	U	L	-	E
Fatty Acids	E	G	-	E
Ferric Chloride	E	E	E	E
Ferric Nitrate	E	E	E	E
Ferric Sulfate	E	E	E	E
Ferrous Chloride	E	U	E	E

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Ferrous Sulfate	E	E	E	E
Fluoboric Acid	E	-	-	E
Fluorine	U	L	-	-
Fluosilicic Acid	U	E	-	E
Formaldehyde 100%	E	E	-	E
Formaldehyde 40%	E	E	E	E
Formic Acid	E	E	L	E
Freon 113	G	G	-	U
Freon 12	E	-	-	U
Freon 22	E	-	-	G
Freon TF	G	-	-	-
Freon® 11	E	-	-	G
Fuel Oils	E	G	-	G
Furan Resin	E	-	-	-
Furfural	U	U	L	U
Gallic Acid	G	-	-	E
Gasoline (high-aromatic)	E	E	-	G
Gasoline, leaded, ref.	G	E	E	G
Gasoline, unleaded	L	E	-	U
Gelatin	G	-	-	E
Glucose	E	E	E	E
Glue, P.V.A.	L	-	-	-
Glycerin	E	E	E	E
Glycolic Acid	G	-	-	-
Grease	E	-	-	-
Heptane	L	G	E	G
Hexane	G	U	U	G
Hydraulic Oil (Petro)	E	-	-	-
Hydraulic Oil (Synthetic)	E	-	-	-
Hydrazine	-	U	-	-
Hydrobromic Acid 100%	E	-	-	G
Hydrobromic Acid 20%	G	-	-	E
Hydrochloric Acid 100%	U	U	-	E
Hydrochloric Acid 20%	E	G	E	E
Hydrochloric Acid 37%	G	U	L	E
Hydrochloric Acid, Dry Gas	E	-	-	E
Hydrocyanic Acid	G	-	-	E
Hydrocyanic Acid (Gas 10%)	E	G	-	L
Hydrofluoric Acid 100%	L	U	-	U
Hydrofluoric Acid 20%	G	U	-	L
Hydrofluoric Acid 50%	G	U	-	U
Hydrofluoric Acid 75%	L	U	-	U
Hydrofluosilicic Acid 100%	G	-	-	G
Hydrofluosilicic Acid 20%	E	-	-	G
Hydrogen Gas	E	E	-	E
Hydrogen Peroxide 10%	E	E	-	E
Hydrogen Peroxide 100%	E	E	-	E
Hydrogen Peroxide 30%	E	E	E	E
Hydrogen Peroxide 50%	E	E	E	-
Hydrogen Sulfide (aqua)	G	E	-	E
Hydrogen Sulfide (dry)	E	-	-	-
Hydroquinone	G	-	-	-
Hydroxyacetic Acid 70%	U	-	-	-
Ink	L	-	-	-
Iodine	E	-	-	L
Iodine (in alcohol)	E	-	-	-
Iodoform	E	-	-	-
Isocetane	E	G	-	U
Isopropyl Acetate	U	U	-	-
Isopropyl Ether	G	U	-	-

## Chemical Resistance Data

**Environmental Resistance Table:** E-Excellent, G-Good, L-Limited, U-Unsatisfactory

**IMPORTANT:** These environmental resistance ratings are based upon tests where the specimens were placed in complete submergence in the reagent listed. Ratings listed in this chart apply to a 48-Hour exposure period. (The information in this chart is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility. Before permanent installation, test the equipment with the chemicals and under the specific conditions of your application.)

Chemical	PVC Himeline HE - Opaque Cover w/Base	Polycarbonate Circuit Safe NEMA Circuit Safe JIC Himeline HE - Clear Cover w/Base Himeline HS - Opaque w/Clear Lids	FRP (Fiberglass Reinforced Polyester) Himeline HS - Bases Himeline HP Himeline HLA/HLS Himeline HLP	Noryl Circuit Safe Medium JIC
Isotane	E	-	-	-
Jet Fuel (JP3, JP4, JP5)	L	E	-	U
Kerosene	E	U	-	U
Ketones	U	U	-	U
Lacquer Thinners	U	G	-	U
Lacquers	U	U	-	U
Lactic Acid	G	G	E	E
Lard	E	E	-	E
Lead Acetate	G	-	-	E
Lead Nitrate	E	-	-	E
Lead Sulfamate	G	E	-	-
Lime	G	-	-	-
Linoleic Acid	E	-	-	-
Lithium Chloride	U	G	-	-
Lithium Hydroxide	-	U	-	-
Lubricants	G	E	-	L
Lye: Ca(OH) <sub>2</sub> Calcium Hydroxide	G	U	-	E
Lye: KOH Potassium Hydroxide	G	U	-	E
Lye: NaOH Sodium Hydroxide	E	U	-	E
Magnesium Bisulfate	E	E	-	-
Magnesium Carbonate	G	E	E	E
Magnesium Chloride	G	E	E	E
Magnesium Hydroxide	E	E	G	E
Magnesium Nitrate	E	E	-	E
Magnesium Oxide	-	-	-	-
Magnesium Sulfate (Epsom Salts)	E	E	E	E
Maleic Acid	E	-	-	E
Malic Acid	E	-	-	-
Manganese Sulfate	L	E	-	E
Mayonnaise	U	-	-	-
Melamine	U	-	-	-
Mercuric Chloride (dilute)	E	E	-	E
Mercuric Cyanide	E	-	-	-
Mercurous Nitrate	E	E	-	E
Mercury	E	U	-	E
Methane	G	-	-	-
Methanol (Methyl Alcohol)	E	G	L	E
Methyl Acetate	U	U	-	-
Methyl Acetone	U	-	-	-
Methyl Alcohol 10%	E	G	-	E
Methyl Bromide	U	-	-	-
Methyl Butyl Ketone	E	U	-	-
Methyl Cellosolve	U	U	-	-
Methyl Chloride	U	U	-	U
Methyl Dichloride	E	-	-	-
Methyl Ethyl Ketone	U	U	E	U
Methyl Isobutyl Ketone	U	U	-	U
Methyl Isopropyl Ketone	U	U	-	U
Methyl Methacrylate	E	-	-	-
Methylamine	U	-	-	-
Methylene Chloride	U	U	U	U
Mineral Spirits	E	L	-	E
Monochloroacetic acid	-	U	-	-
Monoethanolamine	U	-	-	E
Morpholine	-	U	-	U
Motor oil	G	E	-	E
Naphtha	E	G	E	U
Naphthalene	U	-	-	U
Natural Gas	E	-	-	-
Nickel Chloride	E	E	-	E

Chemical	PVC Himeline HE - Opaque Cover w/Base	Polycarbonate Circuit Safe NEMA Circuit Safe JIC Himeline HE - Clear Cover w/Base Himeline HS - Opaque w/Clear Lids	FRP (Fiberglass Reinforced Polyester) Himeline HS - Bases Himeline HP Himeline HLA/HLS Himeline HLP	Noryl Circuit Safe Medium JIC
Nickel Nitrate	E	U	-	E
Nickel Sulfate	E	E	-	E
Nitrating Acid (<15% HNO <sub>3</sub> )	U	-	-	-
Nitrating Acid (>15% H <sub>2</sub> SO <sub>4</sub> )	U	-	-	-
Nitrating Acid (1% Acid)	U	-	-	-
Nitrating Acid (15% H <sub>2</sub> SO <sub>4</sub> )	U	-	-	-
Nitric Acid (20%)	E	G	G	G
Nitric Acid (50%)	G	G	-	G
Nitric Acid (5-10%)	E	E	-	E
Nitric Acid (Concentrated)	G	L	-	G
Nitrobenzene	U	U	L	U
Nitromethane	G	U	-	U
Nitrous Acid	E	-	-	-
Nitrous Oxide	E	-	-	-
Oils:Aniline	U	-	-	U
Oils:Citric	G	E	-	E
Oils:Creosote	L	-	-	U
Oils:Diesel Fuel (20, 30, 40, 50)	G	-	-	U
Oils:Fuel (1, 2, 3, 5A, 5B, 6)	E	G	-	E
Oils:Hydraulic Oil (Petro)	E	-	-	-
Oils:Hydraulic Oil (Synthetic)	E	-	-	-
Oils:Mineral	G	G	-	E
Oils:Olive	L	E	-	E
Oils:Orange	L	L	-	-
Oils:Pine	U	E	-	-
Oils:Rosin	L	-	-	-
Oils:Silicone	E	-	-	E
Oils:Transformer	G	-	-	-
Oils:Turbine	E	-	-	-
Oleic Acid	L	-	E	E
Oleum 100%	U	-	-	E
Oleum 25%	U	-	-	-
Oxalic Acid (cold)	G	-	E	E
Ozone	G	E	-	-
Palmitic Acid	G	-	-	-
Paraffin	G	E	-	E
Pentane	E	E	-	-
Perchloric Acid	L	-	-	-
Perchloroethylene	L	U	-	U
Petrolatum	G	-	-	-
Petroleum	-	-	-	U
Phenol (10%)	L	G	L	U
Phenol (Carbolic Acid)	U	U	-	U
Phosphoric Acid (>40%)	G	E	-	E
Phosphoric Acid (crude)	G	E	-	E
Phosphoric Acid (molten)	U	-	-	-
Phosphoric Acid (40%)	G	E	-	E
Phosphoric Acid Anhydride	-	U	-	-
Phosphorus	E	-	-	-
Phosphorus Trichloride	U	L	-	-
Photographic Developer	E	E	-	E
Photographic Solutions	E	E	-	E
Phthalic Anhydride	U	E	-	-
Picric Acid	U	U	-	-
Potash (Potassium Carbonate)	E	-	L	E
Potassium Bicarbonate	E	-	-	E
Potassium Bromide	E	E	-	E
Potassium Chlorate	E	E	-	E
Potassium Chloride	E	E	E	E
Potassium Chromate	E	-	E	E

## Chemical Resistance Data

**Environmental Resistance Table:** *E-Excellent, G-Good, L-Limited, U-Unsatisfactory*

**IMPORTANT:** These environmental resistance ratings are based upon tests where the specimens were placed in complete submergence in the reagent listed. Ratings listed in this chart apply to a 48-Hour exposure period. (The information in this chart is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility. Before permanent installation, test the equipment with the chemicals and under the specific conditions of your application.)

Chemical	PVC	Polycarbonate	FRP	Noryl	Chemical	PVC	Polycarbonate	FRP	Noryl
	Himeline HE - Opaque Cover w/Base	Circuit Safe NEMA Circuit Safe JIC Himeline HE - Clear Cover w/Base Himeline HS - Opaque w/Clear Lids	(Fiberglass Reinforced Polyester) Himeline HS - Bases Himeline HP Himeline HLA/HLS Himeline HLP	Circuit Safe Medium JIC		Himeline HE - Opaque Cover w/Base	Circuit Safe NEMA Circuit Safe JIC Himeline HE - Clear Cover w/Base Himeline HS - Opaque w/Clear Lids	(Fiberglass Reinforced Polyester) Himeline HS - Bases Himeline HP Himeline HLA/HLS Himeline HLP	Circuit Safe Medium JIC
Potassium Cyanide Solutions	E	-	-	E	Stannic Chloride	E	E	-	E
Potassium Dichromate	E	E	-	E	Stannic Fluoborate	-	-	-	E
Potassium Ferricyanide	E	-	E	E	Stannous Chloride	E	-	-	E
Potassium Ferrocyanide	E	-	E	E	Stearic Acid	G	E	-	E
Potassium Hydroxide (Caustic Potash)	E	U	L	E	Stoddard Solvent	L	E	-	U
Potassium Hypochlorite	G	-	-	-	Styrene	U	U	-	E
Potassium Iodide	E	-	-	-	Sulfate (Liquors)	G	-	-	-
Potassium Nitrate	E	E	E	E	Sulfur Chloride	L	-	-	E
Potassium Oxalate	-	-	-	-	Sulfur Dioxide	E	-	-	E
Potassium Permanganate	E	E	E	E	Sulfur Dioxide (dry)	E	E	-	E
Potassium Sulfate	E	E	E	E	Sulfur Hexafluoride	G	-	-	-
Potassium Sulfide	E	-	-	E	Sulfur Trioxide	E	-	-	U
Propane (liquefied)	E	L	-	E	Sulfur Trioxide (dry)	E	-	-	U
Propylene	G	-	-	-	Sulfuric Acid (<10%)	E	E	E	E
Propylene Glycol	L	G	-	-	Sulfuric Acid (10-75%)	E	G	U	E
Pyridine	U	U	-	G	Sulfuric Acid (75-100%)	U	U	-	E
Pyrogalllic Acid	E	-	-	-	Sulfuric Acid (cold concentrated)	U	-	-	E
Resorcinol	L	G	-	-	Sulfuric Acid (hot concentrated)	U	U	-	U
Rosins	L	-	-	-	Sulfurous Acid	E	-	-	E
Salicylic Acid	G	E	-	-	Tallow	-	-	-	E
Salt Brine (NaCl saturated)	E	E	-	E	Tannic Acid	E	L	-	E
Sea Water	E	E	-	E	Tanning Liquors	E	-	-	E
Silicone	E	E	-	E	Tartaric Acid	E	-	E	E
Silver Bromide	-	-	-	-	Tetrachloroethane	L	-	-	U
Silver Nitrate	-	-	-	E	Tetrachloroethylene	U	U	-	U
Soap Solutions	E	E	-	E	Tetrahydrofuran	U	U	L	U
Soda Ash (see Sodium Carbonate)	E	E	-	E	Tin Salts	E	-	-	-
Sodium Acetate	G	E	E	E	Toluene (Toluol)	U	U	-	U
Sodium Aluminate	-	-	-	E	Trichloroacetic Acid	G	U	-	-
Sodium Benzoate	G	E	-	-	Trichloroethane	L	U	-	U
Sodium Bicarbonate	E	E	E	E	Trichloroethylene	U	-	U	U
Sodium Bisulfate	E	E	-	E	Trichloropropane	-	-	-	U
Sodium Bisulfite	E	E	-	E	Tricresylphosphate	U	-	-	E
Sodium Borate (Borax)	E	E	-	E	Triethylamine	G	-	-	G
Sodium Bromide	G	-	E	E	Trisodium Phosphate	E	-	-	E
Sodium Carbonate	E	E	-	E	Turpentine	U	U	E	U
Sodium Chlorate	E	E	E	E	Urea	U	U	L	E
Sodium Chloride	E	E	E	E	Uric Acid	E	-	-	-
Sodium Chromate	-	E	-	E	Varnish	U	-	-	U
Sodium Cyanide	E	-	-	E	Vinegar	G	E	E	E
Sodium Ferrocyanide	E	-	E	E	Vinyl Acetate	U	-	-	-
Sodium Fluoride	E	-	-	E	Vinyl Chloride	U	-	-	-
Sodium Hydrosulfite	L	-	-	-	Water, Acid, Mine	G	G	-	-
Sodium Hydroxide (20%)	E	E	U	E	Water, Deionized	E	-	-	E
Sodium Hydroxide (50%)	E	U	U	E	Water, Distilled	E	E	-	E
Sodium Hydroxide (80%)	E	U	U	E	Water, Fresh	G	E	-	E
Sodium Hypochlorite (<20%)	E	L	L	E	Water, Salt	G	E	-	E
Sodium Hypochlorite (100%)	G	-	-	E	Whiskey & Wines	E	E	-	E
Sodium Metaphosphate	E	-	-	-	White Liquor (Pulp Mill)	E	-	-	E
Sodium Metasilicate	E	-	-	-	White Water (Paper Mill)	E	-	-	U
Sodium Nitrate	E	-	U	E	Xylene	U	U	E	G
Sodium Perborate	E	-	-	E	Zinc Chloride	G	E	E	E
Sodium Peroxide	G	E	-	-	Zinc Hydrosulfite	-	-	-	E
Sodium Polyphosphate	E	-	-	E	Zinc Sulfate	E	E	E	E
Sodium Silicate	E	-	-	E					
Sodium Sulfate	E	E	E	E					
Sodium Sulfide	E	U	U	E					
Sodium Sulfite	E	-	E	E					
Sodium Tetraborate	E	-	-	E					
Sodium Thiosulfate (hypo)	E	U	-	E					