

## Novamid® ES110J

PA6

Easy Molding Grade

Print Date: 2023-06-03

- ✘ not resistant
- ⓘ limited resistant, tests necessary to verify
- ✔ resistant

*Disclaimer Chemical Resistance*

The chemical resistance data reported here are based on either measured weight/dimensional changes or degree of chemical attack determined from exposure in accordance with one of the relevant established international standards (ISO 175, ISO 11403-3, ISO 4599, ISO 4600, ISO 6252 etc.) or on the supplier's experiences from successful applications of their products. Due to the application specific nature of the surrounding environment of each part during its service life, the indications provided should be used only for a first assessment; they are not intended to substitute for any testing you may need to conduct. You must make your own determination as to the suitability of this material for your specific application. Users shall in each case conduct evaluations under actual end-use conditions and/or consult with the resin supplier's technical representatives.

## Chemical Resistance

- A**
- ⓘ Acetaldehyde (40% by mass) at 23°C
  - ⓘ Acetamide (50% by mass) at 23°C
  - ✘ Acetamide (50% by mass) at >140°C
  - ✘ Acetic acid (10% by mass) at 100°C
  - ⓘ Acetic acid (10% by mass) at 23°C
  - ✘ Acetic acid (95% by mass) at 23°C
  - ✔ Acetone at 23°C
  - ✔ Acetophenone at 23°C
  - ✘ Acetyl chloride at 23°C
  - ✔ Acetylene at 23°C
  - ✘ Acrylic acid at 23°C
  - ✔ Aliphatic amines at 23°C
  - ✔ Aliphatic hydrocarbons at 23°C
  - ✔ Alkylbenzenes at 23°C
  - ⓘ Allyl alcohol at 23°C

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## Property Data

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- ✓ Aluminium acetate (saturated) at 23°C
- ✓ Aluminium chloride (10% by mass) at 23°C
- ✓ Aluminium hydroxide (saturated) at 23°C
- i Aluminium salts of mineral acids (saturated) at 23°C
- ✓ Aluminium trichloride (10% by mass) at 23°C
- ✓ Amino acids (saturated) at 23°C
- ✓ Ammonia at 23°C
- i Ammonium chloride (35% by mass) at 100°C
- ✓ Ammonium chloride (35% by mass) at 23°C
- ✓ Ammonium salts of mineral acids (10% by mass) at 23°C
- i Ammonium salts of mineral acids (10% by mass) at 50°C
- ✓ Ammonium thiocyanate (saturated) at 23°C
- ✗ Amyl acetate at 100°C
- ✓ Amyl acetate at 23°C
- ✓ Amyl alcohol at 23°C
- ✗ Aniline at 23°C
- i Anodizing liquid (HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>) at 23°C
- ✗ Antimony trichloride (saturated) at 23°C
- ✗ Aqua Regia (HCl/HNO<sub>3</sub>) at 23°C
- ✓ Aromatic hydrocarbons at 23°C
- B** i Bariumsalts of mineral acids at 23°C
- i Benzaldehyde at 23°C
- ✓ Benzene at 23°C
- ✓ Benzene at 80°C
- i Benzoic acid (20% by mass) at 23°C
- ✗ Benzoic acid (saturated) at 23°C
- i Benzyl alcohol at 23°C
- ✓ Beverages at 23°C

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- ✘ Bleaching agent (NaOCl) at 23°C
- i Boric acid (10% by mass) at 23°C
- ✘ Boron trifluoride at 23°C
- i Brake fluids (DOT 3/4) at 23°C
- ✘ Bromine water (saturated) at 23°C
- ✓ Bromochlorodifluoromethane at 23°C
- ✓ Bromotrifluoromethane at 23°C
- ✓ Butadiene at 23°C
- ✓ Butane at 23°C
- ✓ Butanediols at 23°C
- i Butanediols at >140°C
- ✓ Butanols at 23°C
- ✓ Butene glycol at 23°C
- i Butene glycol at >160°C
- ✓ Butene-1 at 23°C
- ✓ Butter at 23°C
- ✓ Butyl acetate at 23°C
- ✓ Butyl acrylate at 23°C
- ✓ Butyl glycolate at 23°C
- ✓ Butyl phthalate at 23°C
- i Butyric acid (20% by mass) at 23°C
- ✓ Butyrolactone at 23°C
- i Butyrolactone at >90°C
- C** i Calcium chloride (10% by mass) at 100°C
- ✓ Calcium chloride (10% by mass) at 23°C
- i Calcium chloride (alcoholic) (20% by mass) at 23°C
- ✘ Calcium chloride (saturated) at 100°C
- ✓ Calcium chloride (saturated) at 23°C

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- ⓘ Calcium chloride (saturated) at 60°C
- ✓ Calcium hydroxide (saturated) at 23°C
- ✗ Calcium hypochloride (saturated) at 23°C
- ✓ Camphor (alcoholic) (50% by mass) at 23°C
- ✓ Caprolactam (50% by mass) at 23°C
- ⓘ Caprolactam (50% by mass) at >150°C
- ✓ Carbon disulfide at 23°C
- ✗ Carbon disulfide at 60°C
- ✓ Carbon tetrachloride at 23°C
- ✓ Casein at 23°C
- ✗ Chloral hydrate at 23°C
- ✗ Chloramines (10% by mass) at 23°C
- ⓘ Chlorinated biphenyls at 80°C
- ✗ Chlorine water at 23°C
- ✗ Chloroacetic acid (10% by mass) at 23°C
- ✓ Chlorobenzene at 23°C
- ✓ Chlorobenzene at 50°C
- ⓘ Chlorobromomethane at 23°C
- ✓ Chlorodifluoroethane at 23°C
- ✓ Chlorodifluoromethane at 23°C
- ✓ Chlorofluoroethylene at 23°C
- ✗ Chloroform at 23°C
- ✗ Chlorosulfonic acid (10% by mass) at 23°C
- ⓘ Chromic acid (1% by mass) at 23°C
- ✗ Chromic acid (10% by mass) at 23°C
- ✗ Chromyl chloride at 23°C
- ✓ cis-2-butene at 23°C
- ✓ Citric acid (10% by mass) at 23°C

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- i Citric acid (20% by mass) at 80°C
- i Cobalt salt (20% by mass) at 23°C
- ✓ Copper sulphate (10% by mass) at 23°C
- i Copper(II) salt (10% by mass) at 23°C
- ✗ Cresols at 23°C
- ✓ Cycloalcohols (incl their esters) at 23°C
- ✓ Cycloalkanes at 23°C
- ✓ Cycloalkanones at 23°C
- i Cyclohexanol at 23°C
- D** ✓ Decalin at 23°C
- ✓ Developer (photografic) at 23°C
- ✓ Dibutyl phthalate at 23°C
- ✓ Dibutyl phthalate at 60°C
- ✓ Dichlorobenzene at 23°C
- ✓ Dichloroethane at 23°C
- ✓ Dichloroethylene at 23°C
- ✓ Dichlorofluoromethane at 23°C
- ✓ Dichlorotetrafluoroethane at 23°C
- ✓ Diethyl ether at 23°C
- ✓ Diethylene glycol at 23°C
- ✗ Diethylene glycol at >140°C
- ✓ Difluoromethane at 23°C
- ✓ Dimethyl acetamide at 23°C
- ✗ Dimethyl acetamide at >150°C
- ✓ Dimethyl ether at 23°C
- ✓ Dimethylamine at 23°C
- ✓ Dimethylformamide at 23°C
- i Dimethylformamide at 90°C

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- ✓ Dimethylsilane at 23°C
- ✗ Dimethylsulfoxide at 125°C
- ✓ Dimethylsulfoxide at 23°C
- ✓ Dioctyl phthalate at 23°C
- ✓ Dioxan at 23°C
- ✓ Dioxan at 60°C
- ✓ Diphenyl ether at 80°C
- ✓ Dipropyl ether at 23°C
- E** ✓ Edible fats waxes and oils at 100°C
- ✗ Electroplating bath (acidic) at 23°C
- ✓ Electroplating bath (alkali) at 23°C
- ✓ Ethane at 23°C
- ✓ Ethanol at 23°C
- ✓ Ethyl Acetate at 23°C
- ✓ Ethyl chloride at 23°C
- ✓ Ethylene at 23°C
- ✗ Ethylene carbonate at 100°C
- ✓ Ethylene carbonate at 50°C
- ⓘ Ethylene chlorohydrin at 23°C
- ✗ Ethylene glycol at 100°C
- ✓ Ethylene glycol at 23°C
- ✓ Ethylene oxide at 23°C
- ✗ Ethylene oxide at >80°C
- ✓ Ethylenediamine at 23°C
- F** ✓ Fatty acids at 23°C
- ✓ Fatty alcohols at 23°C
- ✗ Ferric chloride (2,5% by mass) at 100°C
- ⓘ Ferric chloride (2,5% by mass) at 23°C

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- ✓ Fixer (photografic) at 23°C
- ✓ Fluorinated hydrocarbons at 70°C
- ✗ Fluorine at 23°C
- ✓ Formaldehyde (30% by mass) at 23°C
- ✓ Formamide at 23°C
- ✗ Formamide at >150°C
- ✗ Formic acid (10% by mass) at 23°C
- ✗ Formic acid (10% by mass) at 50°C
- ✓ Fruit juices at 23°C
- ✓ Fuel; Diesel at 85°C
- ✓ Fuel; FAM 1A at 23°C
- ✓ Fuel; FAM 2A at 23°C
- ✓ Fuel; Gasoline at 85°C
- ✓ Furfural at 23°C
- ✓ Furfuryl alcohol at 23°C
- G** ✗ Glycerol at 170°C
- ✓ Glycerol at 23°C
- ✗ Glycolic acid (30% by mass) at 23°C
- ✓ Glycols at 23°C
- ⓘ Grease (based on ester oils) at <100°C
- ✓ Grease (based on metal soaps) at <100°C
- ✓ Grease (based on polyphenylester) at <100°C
- H** ✓ Hardening oils at 23°C
- ✓ Heating oils at 23°C
- ✓ Heptane at 23°C
- ✓ Hexachlorobenzene at 80°C
- ✓ Hexachloroethane at 23°C
- ✗ Hexafluoroisopropanol at 23°C

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- ✓ Hexane at 23°C
- ✓ Hydraulic fluids at 100°C
- ✗ Hydrobromic acid (10% by mass) at 23°C
- ✗ Hydrochloric acid (10% by mass) at 23°C
- ✗ Hydrochloric acid (20% by mass) at 23°C
- ✗ Hydrochloric acid (conc.% by mass) at 23°C
- ✗ Hydrofluoric acid (40% by mass) at 23°C
- ✗ Hydrofluoric acid (5% by mass) at 23°C
- ✓ Hydrogen at 23°C
- i Hydrogen peroxide (0.5% by mass) at 23°C
- ✗ Hydrogen peroxide (1% by mass) at 23°C
- ✗ Hydrogen peroxide (3% by mass) at 23°C
- ✗ Hydrogen peroxide (30% by mass) at 23°C
- i Hydrogen sulphide (10% by mass) at 23°C
- ✗ Hydroiodic acid at 23°C
- ✗ Hydroquinone (5% by mass) at 23°C
- I ✓ Impregnating oils at 23°C
- ✓ Ink at 23°C
- ✗ Iodine (alcoholic) at 23°C
- ✗ Iron(III)chloride (acidic) (10% by mass) at 23°C
- ✓ Iron(III)chloride (neutral) (10% by mass) at 23°C
- ✗ Iron(III)chloride (saturated) at 23°C
- i Iron(III)thiocyanate (10% by mass) at 23°C
- ✓ Isocyanates (aromatic) at 23°C
- ✓ Isooctane at 80°C
- ✓ Isopropanol at 23°C
- ✓ Isopropanol at 60°C
- K ✓ Ketones (aliphatic) at 23°C

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- L  Lactic acid at 10°C
- Lactic acid at 90°C
- Lead acetate (10% by mass) at 23°C
- Linseed oil at 23°C
- Lithium bromide (10% by mass) at 23°C
- Lithium chloride (20% by mass) at 23°C
- Lithium hydroxide (10% by mass) at 23°C
- Lithium hydroxide (10% by mass) at 80°C
- Lubricating oil (gear) at <130°C
- Lubricating oil (hydraulics) at <130°C
- Lubricating oil (transformers) at <130°C
- M  Magnesium hydroxide (10% by mass) at 23°C
- Magnesium salts (10% by mass) at 23°C
- Maleic acid (25% by mass) at 23°C
- Maleic acid (saturated) at 23°C
- Manganese salts (10% by mass) at 23°C
- Mercury at 23°C
- Mercury(II)chloride (saturated) at 23°C
- Methane at 23°C
- Methanol at 23°C
- Methyl acetate at 23°C
- Methyl chloride at 23°C
- Methyl ethyl ketone at 23°C
- Methyl formate at 23°C
- Methyl glycol at 23°C
- Methylamine at 23°C
- Methylaniline at 23°C
- Methylbromide at 23°C

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- i Methylene chloride at 23°C
- ✓ Methylpyrrolidone at 23°C
- ✓ Milk at 23°C
- N**
  - ✓ n-Butyl ether at 23°C
  - ✓ n-Butyl glycol at 23°C
  - ✓ Naphtha at 23°C
  - ✓ Naphthalene at 23°C
  - ✗ Naphthalenesulfonic acids at 23°C
  - ✓ Naphthenic acids at 23°C
  - ✗ Naphthols at 23°C
  - i Nickel nitrate (10% by mass) at 23°C
  - ✓ Nickel salts (10% by mass) at 23°C
  - ✗ Nitric acid (10% by mass) at 23°C
  - ✗ Nitric acid (2% by mass) at 23°C
  - ✗ Nitric acid (20% by mass) at 23°C
  - ✗ Nitric acid (conc.% by mass) at 23°C
  - ✗ Nitrobenzene at >100°C
  - ✓ Nitrocellulose lacquers (non-alcoholic) at 23°C
  - ✗ Nitrotoluene at >100°C
  - ✓ Nitrous oxide at 23°C
- O**
  - ✓ Octane at 23°C
  - ✓ Octene at 23°C
  - ✓ Oil (Shell 10W40) at 23°C
  - ✓ Oil (transformers, switchgear) at 50°C
  - ✓ Oils (vegetable, mineral, ethereal) at 23°C
  - ✓ Oleic acid at 23°C
  - ✗ Oleum (H<sub>2</sub>SO<sub>4</sub>+SO<sub>3</sub>) at 23°C
  - ✗ Oxalic acid (10% by mass) at 80°C

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- Ozone at 23°C
- P**  Paint solvents at 23°C
- Palmatic acid at 80°C
- Paraffin at 23°C
- Peracetic acid at 23°C
- Perchloric acid (10% by mass) at 23°C
- Petroleum at 23°C
- Petroleum ether and solvents at 80°C
- Phenol (conc.% by mass) at 23°C
- Phenol at >40°C
- Phenyl ether at 23°C
- Phenyl ethyl alcohol at >160°C
- Phosphate sol. (neutral, alkaline) (10% by mass) at 23°C
- Phosphine at 23°C
- Phosphoric acid (10% by mass) at 23°C
- Phosphoric acid (conc.% by mass) at 23°C
- Polyols at 23°C
- Potassium chloride (10% by mass) at 23°C
- Potassium chloride (10% by mass) at 70°C
- Potassium nitrate (10% by mass) at 23°C
- Potassium permanganate (1% by mass) at 23°C
- Potassium thiocyanate (saturated) at 23°C
- Propane at 23°C
- Propanol at 23°C
- Propanol at >100°C
- Propene at 23°C
- Propionic acid (5% by mass) at 23°C
- Propionic acid (50% by mass) at 23°C

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- ✓ Pyridine at 23°C
- ✗ Pyrocatechol at 23°C
- ✓ Pyrrolidone at 23°C
- R** ✓ Rainwater (acidic) at 23°C
- ✓ Refrigerator oil at 23°C
- ✗ Resorcinol (alcoholic) (50% by mass) at 23°C
- ✓ Road salts at 23°C
- S** ✓ Salicylic acid (saturated) at 23°C
- ✓ Seawater at 23°C
- ✓ Silane at 23°C
- ✓ Silicone oils at <80°C
- ✓ Silver nitrate (10% by mass) at 23°C
- ✓ Soap solution (10% by mass) at 80°C
- ✓ Sodium bichromate (10% by mass) at 23°C
- ✓ Sodium bichromate (5% by mass) at 23°C
- ✓ Sodium carbonate (10% by mass) at 23°C
- ✓ Sodium chlorate (10% by mass) at 23°C
- ✓ Sodium chloride (10% by mass) at 23°C
- ✓ Sodium chloride (saturated) at 23°C
- ✓ Sodium cyanide (10% by mass) at 23°C
- ✓ Sodium dichromate (10% by mass) at 23°C
- ✓ Sodium dodecylbenzenesulfonate at 23°C
- ✓ Sodium hydrogen carbonate (10% by mass) at 23°C
- ✓ Sodium hydrogen sulfate (10% by mass) at 23°C
- ✓ Sodium hydrogen sulfite (10% by mass) at 23°C
- ✓ Sodium hydroxide (10% by mass) at 23°C
- ✗ Sodium hydroxide (10% by mass) at 80°C
- ✓ Sodium hypophosphite (10% by mass) at 23°C

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## Property Data

# Novamid<sup>®</sup> ES110J

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- ✓ Sodium lauryl sulfate (30% by mass) at 23°C
- ✓ Sodium lignosulfonate at 23°C
- ✓ Sodium nitrilotriacetate (10% by mass) at 23°C
- ✓ Sodium oleate at 23°C
- ✓ Sodium pentachlorophenolate at 23°C
- ✓ Sodium pyrosulfite (10% by mass) at 23°C
- ✓ Sodium salts (nitrate, sulfate) (10% by mass) at 23°C
- ✗ Soldering fluid at 23°C
- ✓ Stearate at 23°C
- ✓ Stearic acid at 23°C
- ✓ Styrene at 80°C
- ✓ Sulfonates (10% by mass) at 23°C
- ✓ Sulfur at 23°C
- ✓ Sulfur dioxide (dry) at 23°C
- ✓ Sulfur hexafluoride at 23°C
- ✗ Sulfuric acid (2% by mass) at 23°C
- ✗ Sulfuric acid (30% by mass) at 23°C
- ✗ Sulfuric acid (50% by mass) at 23°C
- ✗ Sulfuric acid (conc.% by mass) at 23°C
- T ✓ Tartaric acid (10% by mass) at 23°C
- ✗ Tetrachloroethylene at 80°C
- ✓ Tetrachloromethane at 23°C
- ✓ Tetrafluoromethane at 23°C
- ✗ Tetrafluoropropanol at 23°C
- ✓ Tetrahydrofuran at 23°C
- ✓ Tetralin at 23°C
- ✓ Tetramethylenesulfone at 23°C
- ✓ Toluene at 100°C

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## Property Data

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- ✓ Toluene at 23°C
- ✓ Transformer oil at 23°C
- ✗ Trichloroacetic acid (50% by mass) at 23°C
- ✓ Trichloroethane at 45°C
- ✗ Trichloroethanol at 23°C
- ✗ Trichloroethylene at >40°C
- ✓ Trichlorotrifluoroethane at 23°C
- ✓ Trietanolamine at 23°C
- ✗ Trifluoroethanol at 23°C
- ✓ Trimethylamine at 23°C
- ✓ Turpentine oil at 23°C
- ✓ Turpentine substitute at 23°C
- U** ✗ Uranium fluoride at 23°C
- ✓ Urea (20% by mass) at 23°C
- ✓ Uric acid (20% by mass) at 23°C
- ✓ Urine at 23°C
- V** ✓ Vaseline (acid free) at 23°C
- ✓ Vinyl bromide at 23°C
- ✓ Vinyl chloride at 23°C
- ✓ Vinyl fluoride at 23°C
- W** ✓ Water (chlorinated) at 80°C
- ✓ Water at 23°C
- ✓ Wax at 80°C
- X** ✓ Xylene at 100°C
- ✓ Xylene at 23°C
- Y** ✓ Yeast at 23°C
- Z** ✗ Zinc bromide (30% by mass) at 23°C
- ⓘ Zinc chloride (10% by mass) at 23°C

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- ✘ Zinc chloride (37% by mass) at 23°C
- ✔ Zinc chloride at 23°C
- ✘ Zinc iodide (30% by mass) at 23°C
- ✘ Zinc nitrate (30% by mass) at 23°C
- ✘ Zinc thiocyanate (30% by mass) at 23°C
- ⓘ Zinc(II)salts of mineral acids (10% by mass) at 23°C

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