



PERMA PURE LLC

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The permeability information presented in this list is determined through detailed analysis of Nafion's chemical structure and its anticipated reactivity with each compound, based on established chemical knowledge. These predictions rely on the principles of polymer chemistry and known chemical interactions, rather than direct experimental measurements.

This data provides directional guidance for evaluating permeation risk. Users should validate critical applications with empirical testing under real-world conditions.

### Nafion™ Tubing Chemical Compatibility

 Perma Pure

Chemical Family	Chemical Name	Chemical Code	CAS Number	Retention Classification
Acid Gases	Acetic Acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	64-19-7	Significant Loss
	Boron Trifluoride	BF <sub>3</sub>	7637-07-2	Fully Retained
	Formic Acid	HCOOH	64-18-6	Partially Retained
	Hydrogen Bromide	HBr	10035-10-6	Fully Retained
	Hydrogen Chloride	HCl	7647-01-0	Fully Retained
	Hydrogen Fluoride	HF	7664-39-3	Fully Retained
	Hydrogen Iodide	HI	10034-85-2	Fully Retained
	Isovaleric Acid	C <sub>5</sub> H <sub>10</sub> O <sub>2</sub>	503-74-2	Partially Retained
	Nitric Acid (Vapor)	HNO <sub>3</sub>	7697-37-2	Fully Retained
	Phosphoric Acid (Vapor)	H <sub>3</sub> PO <sub>4</sub>	7664-38-2	Fully Retained
	Propionic Acid	CH <sub>3</sub> CH <sub>2</sub> COOH	79-09-4	Partially Retained
	Sulfur Dioxide	SO <sub>2</sub>	7446-09-5	Fully Retained
	Sulfur Trioxide	SO <sub>3</sub>	7446-11-9	Fully Retained
	Sulfuric Acid (Vapor)	H <sub>2</sub> SO <sub>4</sub>	7664-93-9	Fully Retained
Alcohols	1-Butanol	C <sub>4</sub> H <sub>9</sub> OH	71-36-3	Significant Loss
	1-Hexanol	C <sub>6</sub> H <sub>13</sub> OH	111-27-3	Significant Loss
	1-Pentanol	C <sub>5</sub> H <sub>11</sub> OH	71-41-0	Significant Loss
	1-Propanol	C <sub>3</sub> H <sub>7</sub> OH	71-23-8	Significant Loss
	2-Butanol	C <sub>4</sub> H <sub>9</sub> OH	78-92-2	Significant Loss
	2-Pentanol	C <sub>5</sub> H <sub>11</sub> OH	6032-29-7	Significant Loss
	2-Propanol (Isopropanol)	(CH <sub>3</sub> ) <sub>2</sub> CHOH	67-63-0	Significant Loss
	Benzyl Alcohol	C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> OH	100-51-6	Significant Loss
	Cyclohexanol	C <sub>6</sub> H <sub>11</sub> OH	108-93-0	Significant Loss
	Ethanol	C <sub>2</sub> H <sub>5</sub> OH	64-17-5	Significant Loss
	Methanol	CH <sub>3</sub> OH	67-56-1	Significant Loss
	Tert-Butanol	(CH <sub>3</sub> ) <sub>3</sub> COH	75-65-0	Significant Loss
Aldehydes	Acetaldehyde	CH <sub>3</sub> CHO	75-07-0	Partially Retained
	Acrolein	C <sub>3</sub> H <sub>4</sub> O	107-02-8	Partially Retained
	Benzaldehyde	C <sub>6</sub> H <sub>5</sub> CHO	100-52-7	Partially Retained
	Butyraldehyde	C <sub>3</sub> H <sub>7</sub> CHO	123-72-8	Partially Retained
	Crotonaldehyde	C <sub>4</sub> H <sub>6</sub> O	123-73-9	Significant Loss
	Formaldehyde	HCHO	50-00-0	Partially Retained
	Hexanal	C <sub>5</sub> H <sub>11</sub> CHO	66-25-1	Partially Retained
	Propionaldehyde	C <sub>2</sub> H <sub>5</sub> CHO	123-38-6	Partially Retained
	Valeraldehyde	C <sub>4</sub> H <sub>9</sub> CHO	110-62-3	Partially Retained
Amides	Dimethylacetamide	CH <sub>3</sub> CON(CH <sub>3</sub> ) <sub>2</sub>	127-19-5	Significant Loss
	Dmf	HCON(CH <sub>3</sub> ) <sub>2</sub>	68-12-2	Significant Loss



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Amines	Aniline	C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>	62-53-3	Partially Retained
	Butylamine	C <sub>4</sub> H <sub>9</sub> NH <sub>2</sub>	109-73-9	Partially Retained
	Diethylamine	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NH	109-89-7	Partially Retained
	Dimethylamine	(CH <sub>3</sub> ) <sub>2</sub> NH	124-40-3	Partially Retained
	Ethylamine	C <sub>2</sub> H <sub>5</sub> NH <sub>2</sub>	75-04-7	Partially Retained
	Methylamine	CH <sub>3</sub> NH <sub>2</sub>	74-89-5	Partially Retained
	Propylamine	C <sub>3</sub> H <sub>7</sub> NH <sub>2</sub>	107-10-8	Partially Retained
	Pyridine	C <sub>5</sub> H <sub>5</sub> N	110-86-1	Partially Retained
	Triethylamine	(C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> N	121-44-8	Partially Retained
	Trimethylamine	(CH <sub>3</sub> ) <sub>3</sub> N	75-50-3	Partially Retained
Aromatics (Hydrocarbons)	Anisole	C <sub>7</sub> H <sub>8</sub> O	100-66-3	Fully Retained
	Anthracene	C <sub>14</sub> H <sub>10</sub>	120-12-7	Fully Retained
	Benzene	C <sub>6</sub> H <sub>6</sub>	71-43-2	Fully Retained
	Cumene	C <sub>6</sub> H <sub>5</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	98-82-8	Fully Retained
	Ethylbenzene	C <sub>6</sub> H <sub>5</sub> C <sub>2</sub> H <sub>5</sub>	100-41-4	Fully Retained
	Isopropyl Benzene	C <sub>6</sub> H <sub>5</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	98-82-8	Fully Retained
	Mesitylene	C <sub>6</sub> H <sub>3</sub> (CH <sub>3</sub> ) <sub>3</sub>	108-67-8	Fully Retained
	Naphthalene	C <sub>10</sub> H <sub>8</sub>	91-20-3	Fully Retained
	Styrene	C <sub>6</sub> H <sub>5</sub> CH=CH <sub>2</sub>	100-42-5	Fully Retained
	Toluene	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	108-88-3	Fully Retained
	Xylene (M-Isomer)	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	108-38-3	Fully Retained
	Xylene (O-Isomer)	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	95-47-6	Fully Retained
	Xylene (P-Isomer)	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	106-42-3	Fully Retained
Basic gases	Ammonia	NH <sub>3</sub>	7664-41-7	Partially Retained
	Ammonium Hydroxide	NH <sub>4</sub> OH	1336-21-6	Significant Loss
	Hydrazine	N <sub>2</sub> H <sub>4</sub>	302-01-2	Partially Retained
	Methylhydrazine	CH <sub>3</sub> NHNH <sub>2</sub>	60-34-4	Partially Retained
Diatomic Gases	Fluorine	F <sub>2</sub>	7782-41-4	Fully Retained
	Hydrogen	H <sub>2</sub>	1333-74-0	Fully Retained
	Nitrogen	N <sub>2</sub>	7727-37-9	Fully Retained
	Oxygen	O <sub>2</sub>	7782-44-7	Fully Retained
Esters	Amyl Acetate	CH <sub>3</sub> COOC <sub>5</sub> H <sub>11</sub>	628-63-7	Fully Retained
	Butyl Acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	123-86-4	Fully Retained
	Ethyl Acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	141-78-6	Partially Retained
	Isobutyl Acetate	CH <sub>3</sub> COOCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	110-19-0	Significant Loss
	Methyl Acetate	CH <sub>3</sub> COOCH <sub>3</sub>	79-20-9	Fully Retained
	Methyl Methacrylate	C <sub>5</sub> H <sub>8</sub> O <sub>2</sub>	80-62-6	Fully Retained
	Propyl Acetate	CH <sub>3</sub> COOC <sub>3</sub> H <sub>7</sub>	109-60-4	Fully Retained
Ethers	1,4-Dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	123-91-1	Significant Loss
	Diethyl Carbitol	(C <sub>2</sub> H <sub>5</sub> OCH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> O	112-36-7	Partially Retained
	Diethyl Ether	C <sub>2</sub> H <sub>5</sub> OC <sub>2</sub> H <sub>5</sub>	60-29-7	Fully Retained
	Diisopropyl Ether	(CH <sub>3</sub> ) <sub>2</sub> CHOCH(CH <sub>3</sub> ) <sub>2</sub>	108-20-3	Fully Retained
	Dimethyl Ether	CH <sub>3</sub> OCH <sub>3</sub>	115-10-6	Fully Retained
	Ethyl Ether	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> O	60-29-7	Significant Loss
	Ethyl Methyl Ether	CH <sub>3</sub> OC <sub>2</sub> H <sub>5</sub>	540-67-0	Fully Retained
	Tetrahydrofuran (Thf)	C <sub>4</sub> H <sub>8</sub> O	109-99-9	Significant Loss



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Fluorinated Hydrocarbons	Chlorodifluoromethane	CHClF <sub>2</sub>	75-45-6	Fully Retained
	Difluoromethane	CH <sub>2</sub> F <sub>2</sub>	75-10-5	Fully Retained
	Hexafluoroethane	C <sub>2</sub> F <sub>6</sub>	76-16-4	Fully Retained
	Tetrafluoromethane	CF <sub>4</sub>	75-73-0	Fully Retained
	Trifluoroethane	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	420-46-2	Fully Retained
Halogenated Hydrocarbons	1,2-Dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	107-06-2	Fully Retained
	Bromobenzene	C <sub>6</sub> H <sub>5</sub> Br	108-86-1	Fully Retained
	Bromoform	CHBr <sub>3</sub>	75-25-2	Fully Retained
	Bromomethane	CH <sub>3</sub> Br	74-83-9	Fully Retained
	Chlorobenzene	C <sub>6</sub> H <sub>5</sub> Cl	108-90-7	Fully Retained
	Chloroethane	C <sub>2</sub> H <sub>5</sub> Cl	75-00-3	Fully Retained
	Chloroform	CHCl <sub>3</sub>	67-66-3	Fully Retained
	Chloromethane	CH <sub>3</sub> Cl	74-87-3	Fully Retained
	Dichloromethane	CH <sub>2</sub> Cl <sub>2</sub>	75-09-2	Fully Retained
	Fluorobenzene	C <sub>6</sub> H <sub>5</sub> F	462-06-6	Fully Retained
	Fluoromethane	CH <sub>3</sub> F	593-53-3	Fully Retained
	Iodomethane	CH <sub>3</sub> I	74-88-4	Fully Retained
	Methyl Bromide	CH <sub>3</sub> Br	74-83-9	Fully Retained
	Methyl Chloride	CH <sub>3</sub> Cl	74-87-3	Fully Retained
	Phosgene	COCl <sub>2</sub>	75-44-5	Fully Retained
	Tetrachloroethylene	C <sub>2</sub> Cl <sub>4</sub>	127-18-4	Fully Retained
	Trichloroethylene	C <sub>2</sub> HCl <sub>3</sub>	79-01-6	Fully Retained
	Trichloroethene (Tce)	C <sub>2</sub> HCl <sub>3</sub>	79-01-6	Fully Retained
Halogens	Bromine	Br <sub>2</sub>	7726-95-6	Fully Retained
	Chlorine	Cl <sub>2</sub>	7782-50-5	Fully Retained
	Fluorine	F <sub>2</sub>	7782-41-4	Significant Loss
	Iodine	I <sub>2</sub>	7553-56-2	Fully Retained
Hydrocarbons - Alkanes	Cyclohexane	C <sub>6</sub> H <sub>12</sub>	110-82-7	Fully Retained
	Ethane	C <sub>2</sub> H <sub>6</sub>	74-84-0	Fully Retained
	Isobutane	(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>3</sub>	75-28-5	Fully Retained
	Isopentane	(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH <sub>3</sub>	78-78-4	Fully Retained
	Methane	CH <sub>4</sub>	74-82-8	Fully Retained
	N-Butane	C <sub>4</sub> H <sub>10</sub>	106-97-8	Fully Retained
	N-Decane	C <sub>10</sub> H <sub>22</sub>	124-18-5	Fully Retained
	Neopentane	C(CH <sub>3</sub> ) <sub>4</sub>	463-82-1	Fully Retained
	N-Heptane	C <sub>7</sub> H <sub>16</sub>	142-82-5	Fully Retained
	N-Hexane	C <sub>6</sub> H <sub>14</sub>	110-54-3	Fully Retained
	N-Nonane	C <sub>9</sub> H <sub>20</sub>	111-84-2	Fully Retained
	N-Octane	C <sub>8</sub> H <sub>18</sub>	111-65-9	Fully Retained
	N-Pentane	C <sub>5</sub> H <sub>12</sub>	109-66-0	Fully Retained
	Propane	C <sub>3</sub> H <sub>8</sub>	74-98-6	Fully Retained



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Hydrocarbons - Alkenes	1-Butene	C <sub>4</sub> H <sub>8</sub>	106-98-9	Fully Retained
	1-Hexene	C <sub>6</sub> H <sub>12</sub>	592-41-6	Fully Retained
	1-Pentene	C <sub>5</sub> H <sub>10</sub>	109-67-1	Fully Retained
	2-Butene (Cis)	C <sub>4</sub> H <sub>8</sub>	590-18-1	Fully Retained
	2-Butene (Trans)	C <sub>4</sub> H <sub>8</sub>	624-64-6	Fully Retained
	2-Pentene (Cis)	C <sub>5</sub> H <sub>10</sub>	627-20-3	Fully Retained
	2-Pentene (Trans)	C <sub>5</sub> H <sub>10</sub>	646-04-8	Fully Retained
	Cyclohexene	C <sub>6</sub> H <sub>10</sub>	110-83-8	Fully Retained
	Ethylene	C <sub>2</sub> H <sub>4</sub>	74-85-1	Fully Retained
	Isobutene	(CH <sub>3</sub> ) <sub>2</sub> C=CH <sub>2</sub>	115-11-7	Fully Retained
	Propene	C <sub>3</sub> H <sub>6</sub>	115-07-1	Fully Retained
	Propylene	C <sub>3</sub> H <sub>6</sub>	115-07-1	Fully Retained
Hydrocarbons - Alkynes	1-Butyne	C <sub>4</sub> H <sub>6</sub>	107-00-6	Partially Retained
	1-Pentyne	C <sub>5</sub> H <sub>8</sub>	627-19-0	Partially Retained
	2-Butyne	C <sub>4</sub> H <sub>6</sub>	503-17-3	Partially Retained
	Acetylene	C <sub>2</sub> H <sub>2</sub>	74-86-2	Partially Retained
	Propyne	C <sub>3</sub> H <sub>4</sub>	74-99-7	Partially Retained
Inert Gases	Argon	Ar	7440-37-1	Fully Retained
	Helium	He	7440-59-7	Fully Retained
	Krypton	Kr	7439-90-9	Fully Retained
	Neon	Ne	7440-01-9	Fully Retained
	Water	H <sub>2</sub> O	7732-18-5	Significant Loss
	Xenon	Xe	7440-63-3	Fully Retained
Ketones	Acetone	CH <sub>3</sub> COCH <sub>3</sub>	67-64-1	Significant Loss
	Acetophenone	C <sub>6</sub> H <sub>5</sub> COCH <sub>3</sub>	98-86-2	Partially Retained
	Cyclohexanone	C <sub>6</sub> H <sub>10</sub> O	108-94-1	Partially Retained
	Diacetyl	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	431-03-8	Significant Loss
	Ethyl Amyl Ketone	C <sub>8</sub> H <sub>16</sub> O	106-68-3	Partially Retained
	Methyl Ethyl Ketone (Mek)	CH <sub>3</sub> COC <sub>2</sub> H <sub>5</sub>	78-93-3	Significant Loss
	Methyl Isobutyl Ketone (Mibk)	C <sub>6</sub> H <sub>12</sub> O	108-10-1	Significant Loss
	Methyl Isobutyl Ketone (Mibk)	CH <sub>3</sub> COCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	108-10-1	Partially Retained
Nitriles	Acetonitrile	CH <sub>3</sub> CN	75-05-8	Partially Retained
	Acrylonitrile	CH <sub>2</sub> =CHCN	107-13-1	Fully Retained
	Benzonitrile	C <sub>6</sub> H <sub>5</sub> CN	100-47-0	Partially Retained
	Butyronitrile	C <sub>3</sub> H <sub>7</sub> CN	109-74-0	Fully Retained
	Hydrogen Cyanide	HCN	74-90-8	Fully Retained
	Propionitrile	C <sub>2</sub> H <sub>5</sub> CN	107-12-0	Fully Retained
Nitro Compounds	1-Nitropropane	C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub>	108-03-2	Fully Retained
	2-Nitropropane	(CH <sub>3</sub> ) <sub>2</sub> CHNO <sub>2</sub>	79-46-9	Fully Retained
	Methyl Nitrate	CH <sub>3</sub> NO <sub>3</sub>	598-58-3	Partially Retained
	Nitrobenzene	C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub>	98-95-3	Partially Retained
	Nitroethane	C <sub>2</sub> H <sub>5</sub> NO <sub>2</sub>	79-24-3	Fully Retained
	Nitromethane	CH <sub>3</sub> NO <sub>2</sub>	75-52-5	Fully Retained
Oxides	Carbon Dioxide	CO <sub>2</sub>	124-38-9	Fully Retained
	Carbon Monoxide	CO	630-08-0	Fully Retained
	Ethylene Oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	Partially Retained
	Nitric Oxide	NO	10102-43-9	Fully Retained
	Nitrogen Dioxide	NO <sub>2</sub>	10102-44-0	Fully Retained
	Nitrous Oxide	N <sub>2</sub> O	10024-97-2	Fully Retained
	Ozone	O <sub>3</sub>	10028-15-6	Fully Retained
	Propylene Oxide	C <sub>3</sub> H <sub>6</sub> O	75-56-9	Partially Retained



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<b>Peroxides</b>	Hydrogen Peroxide (Vapor)	H <sub>2</sub> O <sub>2</sub>	7722-84-1	Significant Loss
	Tert-Butyl Hydroperoxide	(CH <sub>3</sub> ) <sub>3</sub> COOH	75-91-2	Significant Loss
<b>Sulfur-Containing</b>	Carbon Disulfide	CS <sub>2</sub>	75-15-0	Fully Retained
	Dimethyl Sulfide	(CH <sub>3</sub> ) <sub>2</sub> S	75-18-3	Fully Retained
	Dms	(CH <sub>3</sub> ) <sub>2</sub> S	75-18-3	Fully Retained
	Dmso	(CH <sub>3</sub> ) <sub>2</sub> SO	67-68-5	Significant Loss
	Hydrogen Sulfide	H <sub>2</sub> S	7783-06-4	Fully Retained
	Methyl Mercaptan	CH <sub>3</sub> SH	74-93-1	Partially Retained
	Methyl Sulfide	(CH <sub>3</sub> ) <sub>2</sub> S	75-18-3	Fully Retained
	Sulfur Hexafluoride	SF <sub>6</sub>	2551-62-4	Fully Retained
	Thiosinamine	C <sub>4</sub> H <sub>8</sub> N <sub>2</sub> S	109-57-9; 185147-29-9	Significant Loss