

Nafion™ Tubing Chemical Compatibility

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The permeability information presented in this list is determined through detailed analysis of Nafion™ tubing'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.

Chemical Family	Chemical Name	Chemical Code	CAS Number	Retention Classification
Acid Gases	Acetic Acid	$C_2H_4O_2$	64-19-7	Significant Loss
	Boron Trifluoride	BF_3	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	$C_5H_{10}O_2$	503-74-2	Partially Retained
	Nitric Acid (Vapor)	HNO_3	7697-37-2	Fully Retained
	Phosphoric Acid (Vapor)	H_3PO_4	7664-38-2	Fully Retained
	Propionic Acid	CH_3CH_2COOH	79-09-4	Partially Retained
	Sulfur Dioxide	SO_2	7446-09-5	Fully Retained
	Sulfur Trioxide	SO_3	7446-11-9	Fully Retained
	Sulfuric Acid (Vapor)	H_2SO_4	7664-93-9	Fully Retained
Alcohols	1-Butanol	C_4H_9OH	71-36-3	Significant Loss
	1-Hexanol	$C_6H_{13}OH$	111-27-3	Significant Loss
	1-Pentanol	$C_5H_{11}OH$	71-41-0	Significant Loss
	1-Propanol	C_3H_7OH	71-23-8	Significant Loss
	2-Butanol	C_4H_9OH	78-92-2	Significant Loss
	2-Pentanol	$C_5H_{11}OH$	6032-29-7	Significant Loss
	2-Propanol (Isopropanol)	$(CH_3)_2CHOH$	67-63-0	Significant Loss

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
Alcohols	Benzyl Alcohol	$C_6H_5CH_2OH$	100-51-6	Significant Loss
	Cyclohexanol	$C_6H_{11}OH$	108-93-0	Significant Loss
	Ethanol	C_2H_5OH	64-17-5	Significant Loss
	Methanol	CH_3OH	67-56-1	Significant Loss
	Tert-Butanol	$(CH_3)_3COH$	75-65-0	Significant Loss
Aldehydes	Acetaldehyde	CH_3CHO	75-07-0	Partially Retained
	Acrolein	C_3H_4O	107-02-8	Partially Retained
	Benzaldehyde	C_6H_5CHO	100-52-7	Partially Retained
	Butyraldehyde	C_3H_7CHO	123-72-8	Partially Retained
	Crotonaldehyde	C_4H_6O	123-73-9	Significant Loss
	Formaldehyde	HCHO	50-00-0	Partially Retained
	Hexanal	$C_5H_{11}CHO$	66-25-1	Partially Retained
	Propionaldehyde	C_2H_5CHO	123-38-6	Partially Retained
	Valeraldehyde	C_4H_9CHO	110-62-3	Partially Retained
Amides	Dimethylacetamide	$CH_3CON(CH_3)_2$	127-19-5	Significant Loss
	Dmf	$HCON(CH_3)_2$	68-12-2	Significant Loss
	Aniline	$C_6H_5NH_2$	62-53-3	Partially Retained
	Butylamine	$C_4H_9NH_2$	109-73-9	Partially Retained
	Diethylamine	$(C_2H_5)_2NH$	109-89-7	Partially Retained
	Dimethylamine	$(CH_3)_2NH$	124-40-3	Partially Retained
	Ethylamine	$C_2H_5NH_2$	75-04-7	Partially Retained
	Methylamine	CH_3NH_2	74-89-5	Partially Retained
	Propylamine	$C_3H_7NH_2$	107-10-8	Partially Retained
	Pyridine	C_5H_5N	110-86-1	Partially Retained
	Triethylamine	$(C_2H_5)_3N$	121-44-8	Partially Retained
	Trimethylamine	$(CH_3)_3N$	75-50-3	Partially Retained
Aromatics (Hydrocarbons)	Anisole	C_7H_8O	100-66-3	Fully Retained
	Anthracene	$C_{14}H_{10}$	120-12-7	Fully Retained
	Benzene	C_6H_6	71-43-2	Fully Retained
	Cumene	$C_6H_5CH(CH_3)_2$	98-82-8	Fully Retained

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
Aromatics (Hydrocarbons)	Ethylbenzene	$C_6H_5C_2H_5$	100-41-4	Fully Retained
	Isopropyl Benzene	$C_6H_5CH(CH_3)_2$	98-82-8	Fully Retained
	Mesitylene	$C_6H_3(CH_3)_3$	108-67-8	Fully Retained
	Naphthalene	$C_{10}H_8$	91-20-3	Fully Retained
	Styrene	$C_6H_5CH=CH_2$	100-42-5	Fully Retained
	Toluene	$C_6H_5CH_3$	108-88-3	Fully Retained
	Xylene (M-Isomer)	$C_6H_4(CH_3)_2$	108-38-3	Fully Retained
	Xylene (O-Isomer)	$C_6H_4(CH_3)_2$	95-47-6	Fully Retained
	Xylene (P-Isomer)	$C_6H_4(CH_3)_2$	106-42-3	Fully Retained
Basic Gases	Ammonia	NH_3	7664-41-7	Partially Retained
	Ammonium Hydroxide	NH_4OH	1336-21-6	Significant Loss
	Hydrazine	N_2H_4	302-01-2	Partially Retained
	Methylhydrazine	CH_3NHNH_2	60-34-4	Partially Retained
Diatomic Gases	Fluorine	F_2	7782-41-4	Fully Retained
	Hydrogen	H_2	1333-74-0	Fully Retained
	Nitrogen	N_2	7727-37-9	Fully Retained
	Oxygen	O_2	7782-44-7	Fully Retained
Esters	Amyl Acetate	$CH_3COOC_5H_{11}$	628-63-7	Fully Retained
	Butyl Acetate	$CH_3COOC_4H_9$	123-86-4	Fully Retained
	Ethyl Acetate	$CH_3COOC_2H_5$	141-78-6	Partially Retained
	Isobutyl Acetate	$CH_3COOCH_2CH(CH_3)_2$	110-19-0	Significant Loss
	Methyl Acetate	CH_3COOCH_3	79-20-9	Fully Retained
	Methyl Methacrylate	$C_5H_8O_2$	80-62-6	Fully Retained
	Propyl Acetate	$CH_3COOC_3H_7$	109-60-4	Fully Retained
Ethers	1,4-Dioxane	$C_4H_8O_2$	123-91-1	Significant Loss
	Diethyl Carbitol	$(C_2H_5OCH_2CH_2)_2O$	112-36-7	Partially Retained
	Diethyl Ether	$C_2H_5OC_2H_5$	60-29-7	Fully Retained
	Diisopropyl Ether	$(CH_3)_2CHOCH(CH_3)_2$	108-20-3	Fully Retained
	Dimethyl Ether	CH_3OCH_3	115-10-6	Fully Retained
	Ethyl Ether	$(C_2H_5)_2O$	60-29-7	Significant Loss

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
Ethers	Ethyl Methyl Ether	$CH_3OC_2H_5$	540-67-0	Fully Retained
	Tetrahydrofuran (Thf)	C_4H_8O	109-99-9	Significant Loss
Fluorinated Hydrocarbons	Chlorodifluoromethane	$CHClF_2$	75-45-6	Fully Retained
	Difluoromethane	CH_2F_2	75-10-5	Fully Retained
	Hexafluoroethane	C_2F_6	76-16-4	Fully Retained
	Tetrafluoromethane	CF_4	75-73-0	Fully Retained
	Trifluoroethane	$C_2H_3F_3$	420-46-2	Fully Retained
Halogenated Hydrocarbons	1,2-Dichloroethane	$C_2H_4Cl_2$	107-06-2	Fully Retained
	Bromobenzene	C_6H_5Br	108-86-1	Fully Retained
	Bromoform	$CHBr_3$	75-25-2	Fully Retained
	Bromomethane	CH_3Br	74-83-9	Fully Retained
	Chlorobenzene	C_6H_5Cl	108-90-7	Fully Retained
	Chloroethane	C_2H_5Cl	75-00-3	Fully Retained
	Chloroform	$CHCl_3$	67-66-3	Fully Retained
	Chloromethane	CH_3Cl	74-87-3	Fully Retained
	Dichloromethane	CH_2Cl_2	75-09-2	Fully Retained
	Fluorobenzene	C_6H_5F	462-06-6	Fully Retained
	Fluoromethane	CH_3F	593-53-3	Fully Retained
	Iodomethane	CH_3I	74-88-4	Fully Retained
	Methyl Bromide	CH_3Br	74-83-9	Fully Retained
	Methyl Chloride	CH_3Cl	74-87-3	Fully Retained
	Phosgene	$COCl_2$	75-44-5	Fully Retained
	Tetrachloroethylene	C_2Cl_4	127-18-4	Fully Retained
	Trichloroethylene	C_2HCl_3	79-01-6	Fully Retained
	Tricholoroethene (Tce)	C_2HCl_3	79-01-6	Fully Retained
Halogens	Bromine	Br_2	7726-95-6	Fully Retained
	Chlorine	Cl_2	7782-50-5	Fully Retained
	Fluorine	F_2	7782-41-4	Significant Loss
	Iodine	I_2	7553-56-2	Fully Retained
Hydrocarbons - Alkanes	Cyclohexane	C_6H_{12}	110-82-7	Fully Retained

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
Hydrocarbons - Alkanes	Ethane	C_2H_6	74-84-0	Fully Retained
	Isobutane	$(CH_3)_2CHCH_3$	75-28-5	Fully Retained
	Isopentane	$(CH_3)_2CHCH_2CH_3$	78-78-4	Fully Retained
	Methane	CH_4	74-82-8	Fully Retained
	N-Butane	C_4H_{10}	106-97-8	Fully Retained
	N-Decane	$C_{10}H_{22}$	124-18-5	Fully Retained
	Neopentane	$C(CH_3)_4$	463-82-1	Fully Retained
	N-Heptane	C_7H_{16}	142-82-5	Fully Retained
	N-Hexane	C_6H_{14}	110-54-3	Fully Retained
	N-Nonane	C_9H_{20}	111-84-2	Fully Retained
	N-Octane	C_8H_{18}	111-65-9	Fully Retained
	N-Pentane	C_5H_{12}	109-66-0	Fully Retained
	Propane	C_3H_8	74-98-6	Fully Retained
Hydrocarbons - Alkenes	1-Butene	C_4H_8	106-98-9	Fully Retained
	1-Hexene	C_6H_{12}	592-41-6	Fully Retained
	1-Pentene	C_5H_{10}	109-67-1	Fully Retained
	2-Butene (Cis)	C_4H_8	590-18-1	Fully Retained
	2-Butene (Trans)	C_4H_8	624-64-6	Fully Retained
	2-Pentene (Cis)	C_5H_{10}	627-20-3	Fully Retained
	2-Pentene (Trans)	C_5H_{10}	646-04-8	Fully Retained
	Cyclohexene	C_6H_{10}	110-83-8	Fully Retained
	Ethylene	C_2H_4	74-85-1	Fully Retained
	Isobutene	$(CH_3)_2C=CH_2$	115-11-7	Fully Retained
	Propene	C_3H_6	115-07-1	Fully Retained
	Propylene	C_3H_6	115-07-1	Fully Retained
Hydrocarbons - Alkynes	1-Butyne	C_4H_6	107-00-6	Partially Retained
	1-Pentyne	C_5H_8	627-19-0	Partially Retained
	2-Butyne	C_4H_6	503-17-3	Partially Retained
	Acetylene	C_2H_2	74-86-2	Partially Retained
	Propyne	C_3H_4	74-99-7	Partially Retained

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
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_2O	7732-18-5	Significant Loss
	Xenon	Xe	7440-63-3	Fully Retained
Ketones	Acetone	CH_3COCH_3	67-64-1	Significant Loss
	Acetophenone	$C_6H_5COCH_3$	98-86-2	Partially Retained
	Cyclohexanone	$C_6H_{10}O$	108-94-1	Partially Retained
	Diacetyl	$C_4H_6O_2$	431-03-8	Significant Loss
	Ethyl Amyl Ketone	$C_8H_{16}O$	106-68-3	Partially Retained
	Methyl Ethyl Ketone (Mek)	$CH_3COC_2H_5$	78-93-3	Significant Loss
	Methyl Isobutyl Ketone (Mibk)	$C_6H_{12}O$	108-10-1	Significant Loss
	Methyl Isobutyl Ketone (Mibk)	$CH_3COCH_2CH(CH_3)_2$	108-10-1	Partially Retained
Nitriles	Acetonitrile	CH_3CN	75-05-8	Partially Retained
	Acrylonitrile	$CH_2=CHCN$	107-13-1	Fully Retained
	Benzonitrile	C_6H_5CN	100-47-0	Partially Retained
	Butyronitrile	C_3H_7CN	109-74-0	Fully Retained
	Hydrogen Cyanide	HCN	74-90-8	Fully Retained
	Propionitrile	C_2H_5CN	107-12-0	Fully Retained
Nitro Compounds	1-Nitropropane	$C_3H_7NO_2$	108-03-2	Fully Retained
	2-Nitropropane	$(CH_3)_2CHNO_2$	79-46-9	Fully Retained
	Methyl Nitrate	CH_3NO_3	598-58-3	Partially Retained
	Nitrobenzene	$C_6H_5NO_2$	98-95-3	Partially Retained
	Nitroethane	$C_2H_5NO_2$	79-24-3	Fully Retained
	Nitromethane	CH_3NO_2	75-52-5	Fully Retained
Oxides	Carbon Dioxide	CO_2	124-38-9	Fully Retained
	Carbon Monoxide	CO	630-08-0	Fully Retained
	Ethylene Oxide	C_2H_4O	75-21-8	Partially Retained
	Nitric Oxide	NO	10102-43-9	Fully Retained

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Chemical Family	Chemical Name	Chemical Code	CAS Number	Retentin Classification
Oxides	Nitrogen Dioxide	NO_2	10102-44-0	Fully Retained
	Nitrous Oxide	N_2O	10024-97-2	Fully Retained
	Ozone	O_3	10028-15-6	Fully Retained
	Propylene Oxide	C_3H_6O	75-56-9	Partially Retained
Peroxides	Hydrogen Peroxide (Vapor)	H_2O_2	7722-84-1	Significant Loss
	Tert-Butyl Hydroperoxide	$(CH_3)_3COOH$	75-91-2	Significant Loss
Sulfur-Containing	Carbon Disulfide	CS_2	75-15-0	Fully Retained
	Dimethyl Sulfide	$(CH_3)_2S$	75-18-3	Fully Retained
	Dms	$(CH_3)_2S$	75-18-3	Fully Retained
	Dmso	$(CH_3)_2SO$	67-68-5	Significant Loss
	Hydrogen Sulfide	H_2S	7783-06-4	Fully Retained
	Methyl Mercaptan	CH_3SH	74-93-1	Partially Retained
	Methyl Sulfide	$(CH_3)_2S$	75-18-3	Fully Retained
	Sulfur Hexafluoride	SF_6	2551-62-4	Fully Retained
	Thiosinamine	$C_4H_8N_2S$	109-57-9; 185147-29-9	Significant Loss

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