



MATERIALS OF CONSTRUCTION AND CHEMICAL COMPATIBILITY FOR SENSING AND CONTROL PRODUCTS

Introduction

Entegris Sensing and Control products are designed for use in highly corrosive processes and high-purity applications primarily in the semiconductor industry. This guide will help you choose the right materials for your application.

Chemical Compatibility

The following pages provide a chemical compatibility chart for the wetted and nonwetted materials in Entegris NT® products: pressure transducers, flowmeters, proportional control valves and integrated flow controllers. This information is presented to provide basic chemical compatibility information for some of the most common chemicals used in the semiconductor industry. The chart information is a compilation from many sources and is intended to be only a general guideline for materials selection and is not all-inclusive.

Please use this chart to determine whether the parts found in Entegris products will be suitable for use in your application. Please contact Entegris for further chemical compatibility support.

Wetted Part Materials of Construction

Sensing and control products are manufactured with high-purity and inert materials of construction. Flowmeters and pressure transducers have three wetted parts that contact the process fluid which are the body, sensor interface and primary seal. Integrated flow controllers have an additional wetted part which is the valve diaphragm. The wetted parts for the proportional control valve are body and valve diaphragm.

For model-specific wetted materials, visit entegrisfluidhandling.com and search sensing and control products.

Nonwetted Part Materials of Construction

Each application requires different material specifications. Use this guide to select materials to withstand mild to harsh environments, with particular attention to chemical attacks from splashes, spraydown and corrosive vapors. The internal electronics are fully encapsulated for additional protection against corrosive fumes.

Entegris Chemical Compatibility Chart for Sensing and Control Products*

Wetted Parts

A: Preferred, suitable for all high-purity applications.

C: Not recommended for wetted parts in high-purity applications.

B: May not be suitable for wetted parts in high purity applications.

D: Information not available.

		Wetted Surfaces								
Chemical Type	Chemical	Sensor Interface				Body		Primary Seal		
		CTFE**	PFA**	CTFE (HF compatible)	Sapphire	PTFE	PFA	Kalrez® 4079	Kalrez 1050LF	Kalrez 6375UP (Default)
		Code -P1	Code -P2	Code -P5				Code -U1 or -S1	Code -U2 or -S2	Code -U3*** or -S3
Acids	Acetic	A/B	B	D	A	A	A	A	C	A
	HFN	A	B	D	A	A	A	A/B	B/C	A/B
	Hydrochloric (HCl)	A	B	D	A	A	A	A	A	A
	Hydrofluoric (HF)	B	C	A	A	A	A	A	B	A
	Nitric (HNO ₃)	A	B	D	A	A	A	A/B	B/C	A
	Phosphoric (H ₃ PO ₄)	A	A	D	A	A	A	A	A	A
	Sulfuric (H ₂ SO ₄)	A	A	D	A	A	A	A	A	A
Bases	Ammonium Fluoride (NH ₄ F)	A	A	D	A	A	A	B	A/B	A
	Ammonium Hydroxide (NH ₄ OH)	A	B	D	A	A	A	B	A/B	A
	Potassium Hydroxide (KOH)	A	A	D	A	A	A	A	A	A
Oxidants	Hydrogen Peroxide (H ₂ O ₂)	A	A	D	A	A	A	A	A	A
	Dissolved Ozone	A	A	D	A	A	A	B	B	A/B
	Dissolved Chlorine	B	A	D	A	A	A	B	B/C	B
Organic solvents	Acetone	B	A	D	A	A	A	A	A	A
	n-Butyl Acetate	B	A	D	A	A	A	A	A	A
	Ethylene Glycol	A	A	D	A	A	A	A	A	A
	Isopropyl Alcohol	A	A	D	A	A	A	A	A	A
	Methanol	A	A	D	A	A	A	A	A	A
	Methyl Ethyl Ketone (MEK)	C	A	D	A	A	A	A	A	A
	n-methyl pyrrolidone (NMP)	B	A	D	A	A	A	A	A	A
	Tetramethylammonium Hydroxide (TMAH)	A	B	D	A	A	A	B	A	A
Organic solvents categories	Acetates	B	A	D	A	A	A	A	A	A
	Alcohols	A	A	D	A	A	A	A	A	A
	Amines	B	A	D	A	A	A	C	A	A
	Hydrocarbons, aromatic	B	A	D	A	A	A	A	A	A
	Hydrocarbons, alkane	A/B	A	D	A	A	A	A	A	A
	Ketones	B	A	D	A	A	A	A	A	A
Media temperature	High temperature (>40°C)	B	A	C	C	A	A	A/B	A	A

*Not applicable for NT stainless steel electronic flowmeter, Model 5400.

**The suitability of CTFE and PFA is based on both chemical resistance and permeability.

***Recommended for new application.

Notes: The compatibility chart is compiled from information published by Entegris, DuPont Dow Elastomers, Welch Fluorocarbon, Little Giant Pump Company, the PDL Handbook and Compass Corrosion Guide.

Entegris neither represents nor warrants the accuracy or sufficiency of the information set forth in this chart for specific end-user applications. Ultimate responsibility for material selection remains with the end user. Nothing in this chart constitutes a change to the terms and conditions under which the Entegris product was sold.

Interface Material Selection Guide:

P1	Aqueous acids and bases up to 40°C maximum Dilute HF 1% and below [†]
P2	Solvents, slurry, aqueous acids and bases above 40°C
P5	HF only

[†]Contact Entegris for long-term product performance in dilute HF.

Nonwetted Parts

A: Preferred, suitable for all high-purity applications.

C: May be suitable for nonwetted parts in some applications.

B: Acceptable, suitable for nonwetted parts in most applications.

D: Information not available.

Chemical Type	Chemical	PVDF	PP	PE	Nylon	PVC	FEP	Viton®	Delrin®	PUR	Polyester
Acids	Acetic	B	B	B	C	C	A	B	B	C	B
	HFN	B	C	B	D	D	D	D	D	D	D
	Hydrochloric (HCl)	A, B	B	B	C	C	A	D	C	C	C
	Hydrofluoric (HF)	A	B	B	C	C	A	C	C	C	C
	Nitric (HNO ₃)	B	C	B	C	C	A	B	C	C	C
	Phosphoric (H ₃ PO ₄)	A	B	B	C	A	A	A	C	C	C
	Sulfuric (H ₂ SO ₄)	B	C	B	C	B	A	A	C	C	C
Bases	Ammonium Fluoride (NH ₄ F)	A	A	B	A, B	A, B	A	A	D	D	D
	Ammonium Hydroxide (NH ₄ OH)	A	A	B	B	A	A	C	C	C	C
	Potassium Hydroxide (KOH)	A	A	B	B	A	A	C	B	C	C
Oxidants	Hydrogen Peroxide (H ₂ O ₂)	A	B	B	C	A, B	A	A	C	A, B	C
	Dissolved Ozone	A	C	C	C	A	A	A	C	A	C
	Dissolved Chlorine	A	C	B	C	D	A	B	C	C	C
Organic solvents	Acetone	C	A	B	A	C	A	C	B	C	A, B
	n-Butyl Acetate	B	C	C	A	A, B	A	C	B	C	A
	Ethylene Glycol	B	A	B	A	A	A	A	A, B	A, B	A, B
	Isopropyl Alcohol	A	A	B	A, B	A	A	A	A	C	A
	Methanol	A	A	B	C	A	A	C	A	C	A
	Methyl Ethyl Ketone (MEK)	C	B	C	A	C	A	C	A, B	C	A
	n-methyl pyrrolidone (NMP)	C	B	B	C	D	D	D	D	D	D
Organic solvents categories	Tetramethylammonium Hydroxide (TMAH)	A	A	D	D	D	A	D	D	D	D
	Acetates	B	B	C	A	C	A	D	A	C	D
	Alcohols	A	A	B	A, B	A	A	D	A	C	D
	Amines	C	B	C	D	C	A	C	A	D	D
	Hydrocarbons, aromatic	B	C	C	A	C	A	B	A, B	C	C
	Hydrocarbons, alkane	B	C	B	D	D	D	D	D	D	D
	Ketones	B	B	C	A	C	A	D	A, B	C	C
Media temperature	High temperature (>40°C)	A	B	A	D	D	D	D	D	D	D

Notes: The compatibility chart is compiled from information published by Entegris, DuPont Dow Elastomers, Welch Fluorocarbon, Little Giant Pump Company, the PDL Handbook and Compass Corrosion Guide.

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