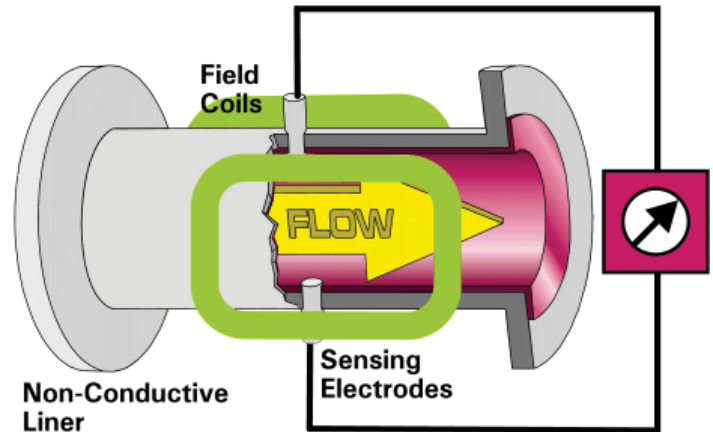


# Magnetic Flowmeter Material Selection Guide



## Introduction

The purpose of this guide is to provide a general resource for the selection of materials for the magnetic flowmeter. The magnetic flowmeter is ideal for a wide range of processes including highly corrosive chemicals and abrasive slurries due to the availability of a wide selection of materials of construction.



## Disclaimer

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

The data presented in this guide is based on field experience and published data. However, because of the wide variety of processes and applications it is impossible to guarantee material compatibility in a given process without corrosion tests under actual operating conditions being done. Therefore the final decision of material resides with the user.

Some of the process fluids listed in this guide do not meet the minimum conductivity requirements (5 micro-siemens/cm) for a magmeter. However, they are listed to aid the user in instances where there may be trace amounts contained in the process fluid.

	Liner Material					Electrode and Grounding Ring Material						
	Ceramic	FEP/PTFE	Polyurethane	Neoprene	Hard Rubber	316SS	Hastelloy C	Monel	Tantalum	Titanium	Platinum	Zirconium
Acetaldehyde	A	A	N	B	N	A	A	A	A	A	A	A
Acetic Acid (70% Max)	A	A	N	N	N	A	A	A	A	A	A	A
Alumina Slurry	A	N	A	A	U	A	A	A	A	A	N	A
Aluminum Bicarbonate (50% Max)	U	A	N	N	U	B	U	N	A	A	A	U
Aluminum Chloride (20% Max)	A	A	N	A	N	N	A	N	A	N	A	A
Aluminum Fluoride	U	A	N	N	N	N	N	N	N	N	A	N
Aluminum Potassium Sulfate (Alum)	A	A	B	A	B	A	B	N	A	A	A	A
Aluminum Sulfate (50% Max)	A	A	N	A	N	A	A	N	A	A	A	A
Ammonium Bicarbonate (50% Max)	U	A	N	N	N	B	U	N	A	A	A	N
Ammonium Bifluoride (50% Max)	U	A	N	N	N	N	B	N	N	N	A	U
Ammonium Carbamate (50% Max)	U	A	N	N	N	N	B	U	U	A	U	U
Ammonium Carbonate (50% Max)	A	A	N	N	N	B	B	N	A	U	A	N
Ammonium Chloride (25% Max)	A	A	B	A	A	B	A	N	A	A	A	A
Ammonium Fluoride (50% Max)	U	A	N	N	N	N	U	N	N	N	A	U
Ammonium Hydroxide (30% Max)	A	A	A	A	A	B	B	N	N	A	A	B
Ammonium Nitrate	A	A	B	A	B	A	B	N	A	N	A	A
Ammonium Persulfate	A	A	N	N	N	N	N	N	A	N	A	N
Ammonium Phosphate	A	A	N	N	N	A	U	U	A	U	A	A
Ammonium Sulfate	A	A	N	A	B	B	B	B	A	U	A	A
Barium Chloride (30% Max)	A	A	N	N	A	N	B	B	A	B	A	A
Barium Hydroxide (50% Max)	B	A	A	A	A	A	B	B	A	U	A	A
Barium Sulfate	A	A	U	U	U	N	N	B	A	A	A	A
Beer	A	A	N	N	U	A	A	A	A	A	A	A
Black Liquor	U	A	N	N	U	B	B	U	N	U	A	A
Bleach, Active Chlorine 12.5%	A	A	N	A	A	N	A	U	U	U	U	U
Boric Acid (50% Max)	A	A	A	A	A	B	A	N	A	A	A	A
Brine	A	A	B	A	A	A	A	A	A	A	A	A
Calcium Bisulfite	A	A	A	A	A	A	N	N	A	A	A	A
Calcium Carbonate	U	A	A	A	A	B	B	B	A	A	A	A
Calcium Chlorate (30% Max)	U	A	N	N	A	B	B	B	B	B	A	N
Calcium Chloride (50% Max)	A	A	A	A	A	N	A	N	A	A	A	A
Calcium Hydroxide (50% Max)	A	A	A	A	B	B	A	U	A	A	U	A
Calcium Hypochlorite	A	A	N	N	B	N	N	N	A	A	A	B
Calcium Nitrate (10% Max)	A	A	U	U	B	B	B	B	A	A	A	N
Calcium Sulfate (10% Max)	A	A	N	N	B	A	U	U	A	A	A	A
Cane Sugar Juice	A	A	N	A	A	A	A	A	A	A	A	A
Carbon Slurry	A	B	A	N	A	A	A	A	A	A	A	A
Carbonic Acid (60% Max)	A	A	B	B	B	U	N	U	A	A	A	A
Caustic Soda (50% Max)	N	A	N	N	N	B	U	A	N	B	A	A
Chlorine Dioxide (15% Max)	A	A	N	N	N	N	U	U	A	A	U	N
Chlorine Water (<2500 ppm)	A	A	N	N	A	N	A	N	A	A	A	N
Chlorine Water (Saturated)	A	A	U	N	A	N	A	U	B	A	A	A
Chromic Acid (50% Max)	B	A	N	N	N	N	B	U	A	A	A	A
Citric Acid	A	A	N	A	A	A	A	B	A	A	A	A
Clay Slurry	A	A	A	A	A	A	A	A	A	A	A	A
Coal & Water Slurry	U	N	A	A	A	U	A	U	A	A	A	U
Coffee Extract	U	A	A	A	U	A	A	A	A	A	A	A
Cola Syrup	U	A	A	A	U	A	A	A	A	A	A	A
Copper Chloride (50% Max)	A	A	A	A	U	N	A	N	A	A	U	N

Legend  
 A - Generally Suitable  
 B - Use Caution  
 N - Not Recommended  
 U - No Data Available

	Liner Material					Electrode and Grounding Ring Material						
	Ceramic	FEP/PTFE	Polyurethane	Neoprene	Hard Rubber	316SS	Hastelloy C	Monel	Tantalum	Titanium	Platinum	Zirconium
Copper Nitrate (50% Max)	U	A	U	U	U	B	N	N	A	A	A	N
Copper Sulfate (70% Max)	A	A	A	A	U	B	A	N	A	B	A	N
Cupric Chloride	U	A	U	U	A	N	N	N	A	B	A	N
Ethylene Glycol	U	A	N	A	N	A	A	U	A	A	A	U
Ferric Chloride (50% Max)	A	A	N	A	A	N	N	N	A	A	A	N
Ferric Nitrate (10% Max)	A	A	U	U	A	B	N	N	A	U	A	N
Ferric Sulfate (10% Max)	A	A	U	U	A	N	B	N	A	A	A	A
Ferrous Chloride (10% Max)	U	A	N	N	A	N	N	N	A	A	U	A
Ferrous Sulfate (50% Max)	U	A	N	N	A	N	N	N	A	A	A	A
Fluosillicic Acid	U	A	N	N	A	N	N	N	N	N	A	N
Formaldehyde (35% Max)	A	A	N	A	B	A	B	B	A	A	A	A
Formic Acid (80% Max)	A	A	B	A	N	N	N	N	A	N	A	A
Fruit Juices	A	A	N	N	N	A	A	A	A	A	A	A
Green Liquor	A	A	N	N	U	B	B	B	A	A	A	N
Hydrochloric Acid (Ambient Temp)	A	A	N	A	B	N	N	N	A	N	A	A
Hydrocyanic Acid (10% Max)	A	A	N	N	B	B	U	A	A	U	A	N
Hydrofluoric Acid (70% Max)	B	A	N	N	N	N	N	N	N	N	A	N
Hydrogen Peroxide (50% Max)	A	A	N	A	B	B	U	N	A	A	U	A
Hypochlorous Acid	U	A	N	N	N	N	N	N	A	N	A	N
Latex	A	A	N	N	A	A	U	U	A	U	A	A
Lead Nitrate (60% Max)	U	A	U	U	B	B	B	B	A	U	A	N
Lime Slurry (Calcium Oxide)	U	A	A	A	N	A	A	A	A	A	A	A
Lithium Chloride	U	A	U	U	U	N	A	A	A	A	A	A
Magnesium Carbonate (10% Max)	U	A	U	U	U	B	B	B	A	U	U	A
Magnesium Chloride (40% Max)	A	A	A	A	B	B	A	B	A	A	U	A
Magnesium Nitrate	U	A	U	U	B	B	B	B	A	B	U	B
Magnesium Sulfate (40% Max)	A	A	U	U	B	A	A	A	A	A	A	A
Mercuric Chloride (60% Max)	A	A	N	A	A	N	N	N	A	A	A	A
Milk	A	A	N	N	N	A	U	B	A	U	A	U
Molasses	A	A	N	N	N	A	U	A	U	U	A	U
Monomers	A	U	U	U	U	U	U	U	U	U	U	U
Nickel Chloride (20% Max)	A	A	U	U	A	N	N	N	A	N	U	A
Nickel Nitrate (10% Max)	N	A	U	U	A	B	B	B	A	B	U	N
Nickel Sulfate (20% Max)	A	A	U	U	A	B	B	B	A	U	U	A
Nitric Acid (Ambient Temp)	A	A	N	N	N	A	N	N	A	A	A	B
Oleum	N	A	N	N	N	B	B	N	N	U	A	N
Oxalic Acid	A	A	U	U	N	N	B	N	A	N	A	A
Phosphoric Acid (85% Max)	N	A	N	B	B	N	N	A	A	N	A	B
Photographic Emulsion	N	A	N	B	U	A	U	U	A	A	U	A
Polymers	A	U	U	U	U	U	U	U	U	U	U	U
Potassium Bicarbonate (30% Max)	U	A	N	N	A	A	B	B	A	A	U	A
Potassium Carbonate	U	A	U	U	U	B	A	B	A	A	A	A
Potassium Chloride (30% Max)	A	A	N	A	U	A	B	B	A	A	U	A
Potassium Dichromate (60% Max)	A	A	N	A	A	A	B	B	A	A	A	A
Potassium Hydroxide (Caustic Potash / 50% Max)	A	A	B	B	N	B	B	A	B	N	A	A
Potassium Hypochlorite (40% Max)	U	A	N	N	N	N	B	N	B	A	U	N
Potassium Nitrate (80% Max)	A	A	N	A	A	B	B	B	B	A	U	N
Potassium Permanganate (10% Max)	U	A	U	U	B	B	B	B	B	B	U	N
Potassium Persulfate (10% Max)	U	A	U	U	U	A	N	N	A	A	A	A

Legend  
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 B - Use Caution  
 N - Not Recommended  
 U - No Data Available

	Liner Material					Electrode and Grounding Ring Material						
	Ceramic	FEP/PTFE	Polyurethane	Neoprene	Hard Rubber	316SS	Hastelloy C	Monel	Tantalum	Titanium	Platinum	Zirconium
Potassium Sulfate (20% Max)	A	A	N	A	A	A	A	A	A	A	A	A
Potassium Sulfide (10% Max)	U	A	U	U	A	B	U	U	B	A	U	A
Salicylic Acid	A	A	N	N	N	B	U	A	A	U	A	N
Sea Water	A	A	N	A	U	B	A	U	A	A	A	U
Sewage, Raw	A	A	A	B	A	A	A	A	A	A	A	A
Silver Nitrate (50% Max)	A	A	U	U	U	B	U	N	B	B	U	A
Sludge, Activated	A	A	A	A	A	A	A	A	A	A	A	A
Sludge, Primary	A	A	A	A	A	A	A	A	A	A	A	A
Soap Solutions	A	A	B	A	A	A	A	N	U	U	A	A
Sodium Acetate	A	A	U	U	U	B	A	A	A	A	A	A
Sodium Bicarbonate (20% Max)	A	A	U	U	A	A	A	A	A	A	A	A
Sodium Bisulfate (40% Max)	U	A	N	A	A	N	N	B	A	U	A	A
Sodium Bisulfite (40% Max)	A	A	U	U	A	N	B	B	A	B	A	N
Sodium Borate (Borax)	A	A	U	U	A	B	B	B	B	U	U	N
Sodium Carbonate	U	A	N	A	A	A	A	A	B	A	A	N
Sodium Chlorate (40% Max)	U	A	N	A	A	B	B	A	A	A	U	N
Sodium Chloride (30% Max)	A	A	B	A	A	B	A	A	A	A	A	A
Sodium Chromate	U	A	U	U	U	A	A	A	A	A	A	A
Sodium Cyanide	A	A	U	U	B	A	N	N	A	A	A	N
Sodium Hydroxide (10% Max)	A	A	N	N	N	B	A	A	N	B	A	A
Sodium Hydroxide (50% Max)	A	A	N	N	N	B	A	A	N	B	A	A
Sodium Hydroxide (100% Max / Ambient Temp)	A	A	N	N	N	B	A	B	N	N	A	A
Sodium Hypochlorite (20% Max)	A	A	N	N	A	N	A	N	A	A	A	A
Sodium Nitrate (40% Max)	A	A	N	A	A	A	U	A	A	A	A	A
Sodium Nitrite (40% Max)	U	A	U	U	U	A	A	A	A	A	A	A
Sodium Phosphate	A	A	N	A	B	B	A	A	A	A	A	A
Sodium Phosphate (Tri-Basic)	U	A	A	N	A	A	A	A	A	A	A	B
Sodium Silicate	A	A	N	N	B	A	B	A	A	A	A	A
Sodium Sulfate (30% Max)	A	A	N	A	B	B	B	B	A	B	A	A
Sodium Sulfide (40% Max)	U	A	U	U	B	N	N	B	A	U	A	N
Sodium Sulfite (30% Max)	U	A	U	U	U	B	N	N	A	A	A	N
Sulfuric Acid (1-20%)	A	A	N	A	U	N	N	B	A	N	A	B
Sulfuric Acid (21-40%)	A	A	N	B	N	N	N	B	A	N	A	B
Sulfuric Acid (41-70%)	A	A	N	N	N	N	N	N	A	N	A	B
Sulfuric Acid (71-100%)	A	A	N	N	U	N	N	N	A	N	A	N
Sulfurous Acid	B	A	N	N	N	N	B	N	A	A	A	A
Sugar Juice	A	A	N	B	U	A	A	A	A	A	A	A
Tannic Acid	A	A	A	B	B	A	U	A	A	A	A	A
Tartaric Acid	A	A	A	A	U	A	A	A	A	B	A	A
Titanium Dioxide	A	A	A	A	B	A	A	A	A	A	A	A
Trisodium Phosphate	U	A	A	N	A	A	A	A	A	A	A	B
Urea (50% Max)	U	A	N	N	B	B	U	U	U	A	U	A
Water, Clean or Dirty	A	A	A	A	U	A	A	A	A	A	A	A
White Liquor	U	A	N	N	B	B	N	B	N	A	A	A
Zinc Chloride (20% Max)	A	A	N	A	N	U	B	B	A	A	B	A
Zinc Sulfate (30% Max)	A	A	N	A	B	B	B	A	A	A	A	A

Legend  
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