PENDOTECH
Adding Value To Your Process

PendoTECH Sensor Chemical Compatibility

Compatibility Ratings:
A- Excellent Compatibility- Exposure to chemical will cause no or minor effects
C- Moderate Compatibility- Sustained exposure may have some effects, but is still acceptable for use
X- Not Compatible- Avoid exposure as chemical will significantly effect or damage sensor
U- Unknown or Inconclusive data

Additional Information
1- Compatibility affected by higher temperatures (See comments)
2- Compatibility affected by higher concentrations (See Comments)

Disclaimer: The conclusions in this document were drawn from published information from multiple sources, with judgement applied when conflicting information was found. This document is for reference only. PendoTECH assumes no liability with respect to the accuracy or completeness of the information. Specific conditions of use and customer applications of PendoTECH products are beyond PendoTECH's control. Therefore, it is imperative that products be tested in each particular application to determine ultimate compatibility.

Important Note: Compatibilty ratings are based on exposure of each chemical with components in the sensor's flowpath.

Revision 3

Chemicals	Pressure Sensors	Comments	Conductivity/ Temperature Sensors	Comments	UV & Turbidity Flow Cells*	Comments
Acetate Buffers	**A**	Excellent compatibility at typical operational pH ranges (pH 3-8)	**A1**	Acetate buffers that contain acetic acid as an active component may have some effect on the stainless steel probes. The affect may be severe for concentrations > 80%	**A**	Excellent compatibility at typical operational pH ranges (pH 3-8)
Acetic Acid	**A1-2**	Exposure to glacial or pure acetic acid, or sustained exposure at temperatures > 50℃ will likely cause some damage	**C1-2**	Exposure to high concentrations (>80%) or sustained exposure at temperatures > 50℃ will likely cause some sensor damage	**A1-2**	Exposure to glacial or pure acetic acid, or sustained exposure at temperatures > 50℃ will likely cause some damage
Ammonium Sulfate	**A**	-	**A**	-	**A**	-
Arginine	**U**	No compatibility data found	**U**	No compatibility data found	**U**	No compatibility data found
Citric Acid	**A1**	Extended exposure to temperatures > 50℃ may weaken resistance	**A1**	Extended exposure to temperatures > 50℃ may weaken resistance	**A1**	Extended exposure to temperatures > 50℃ may weaken resistance
Citric Acid Buffers	**A**	-	**A**	-	**A**	-
Dimethyl Sulfoxide (DMSO)	**A2**	Concentrations greater than 50% will likely cause damage and should be avoided	**A2**	Limited data on compatibility with stainless steel, but DMSO is not anticipated to cause any adverse effects	**A2**	Concentrations greater than 50% will likely cause damage and should be avoided
Ethanol 50%	**A1**	Extended exposure at temperatures > 50℃ may cause minor damage	**A1**	Extended exposure at temperatures > 50℃ may cause minor damage	**A1**	Extended exposure at temperatures > 50℃ may cause minor damage
Formic Acid	**A1-2**	Sustained exposure at high temperatures > 50℃ should be avoided, especially for concentrations > 50%	**A1-2**	Sustained exposure at high temperatures > 50℃ should be avoided, especially for concentrations > 50%	**A1-2**	Sustained exposure at high temperatures > 50℃ should be avoided, especially for concentrations > 50%
Guanidine HCl	**A**	Limited information was found, but the available data did support compatibility	**X**	Although compatibility data is limited, Gd-HCl is not recommended for use with stainless steel electrodes	**A**	-
Hydrochloric Acid	**A2**	Concentrations greater than 50% may damage silicone and should be avoided for sustained exposure	**X**	Stainless steel demonstrates poor resistance to HCl, therefore any exposure should be avoided	**A2**	Concentrations greater than 50% may damage Silicone O-rings
Peracetic Acid	**U**	Overall data on compatibility was lacking. There were conflicting results on its effects on polycarbonate and silicone. Testing should be done to clarify	**U**	Limited data regarding compatibility with both polysulfone body and stainless steel electrodes. However, available data does suggest the sensor is likely compatible	**U**	Limited data on compatibility. Polysulfone body is likely compatible, but there was conflicting data on its effect on Silicone O-rings
Phosphate Buffers	**A**	-	**A**	Excellent compatibility at typical operational pH ranges (pH 3-8)	**A**	-
Phosphoric Acid	**A1-2**	Typical operating conditions are acceptable. Higher temperatures and concentrations could be problematic	**X**	Not recommended	**A1-2**	Typical operating conditions are acceptable. Higher temperatures and concentrations could be problematic
Polysorbate 80	**A**	-	**A**	Data is limited on direct compatibility with stainless steel electrodes, however there is no reason to believe it would cause any adverse effects	**A**	-
Sodium Chloride	**A**	-	**A**	Extended exposure may cause minor effects or minimal corrosion to stainless steel probes.	**A**	-
Sodium Hydroxide (PREPS polysulfone sensors)	***Short Term*: A** ***Long Term*: C**	Short term exposure for cleaning will not cause any adverse effects. However, continuous exposure for 3 or more weeks may lead to leaks	**A1**	Concentrations > 50% may have a minor effect	**A**	-
Sodium Hydroxide (PRESS polycarbonate sensors)	**X**	Not compatible. Any exposure to NaOH should be avoided	**-**	-	**-**	-
Sodium Hypochlorite	**A**	-	**A1**	Pure solutions with concentrations close to 100% will likely cause major effects, while lower concentrations (~20%) may cause minor effects to stainless steel probes	**A**	-
Sulfuric Acid	**C2**	Silicone was reported to be damaged by concentrations > 10% (~2N). Sensor is likely compatible for short term exposure, but long term exposure may cause damage	**X**	Stainless steel is not resistant to sulfuric acid and thus exposure will likely cause adverse effects	**C2**	Concentrations greater that 10% may have an effect on Silicone O-rings. Short term exposure should be fine, but long term exposure increases risk of damage
Tris Base	**A1/C1***	Exposure at temperatures >50℃ may cause some damage **Polycarbonate sensors should avoid exposure to caustic solutions (≥11 pH), especially at higher temperatures*	**U**	Affects of Tris Base on stainless steel have not been published, therefore sensor compatibility is inconclusive	**A1**	Compatible with neutral (pH ~ 7) solutions, but exposure at higher temperatures (> 50℃) may cause some damage. Compatibility with caustic (pH ≥11) solutions is unclear
Urea	**A2**	Concentrations > 20% have been reported to cause some damage to polysulfone	**A2**	Concentrations > 20% have been reported to cause some damage to polysulfone	**A2**	Concentrations > 20% have been reported to cause some damage to polysulfone

** PendoTECH's UV & Turbidity sensor contain a special silica (fused quartz) glass lens. There is a lack of concrete data on the direct compatibility between silica and many of the chemicals reported here. Silica is known to be an inert material that demonstrates strong resistances to most acid, alkaline, and neutral compounds. However, there are some exceptions, including Hydrofluoric Acid (HF) and phosphoric acid at high concentrations or temperatures. The lenses likely do not have a major impact on the compatibility of the sensor.*