

VX 456[®] Chemical Oxidizer: Material Compatibility Data Sheet

Introduction

The following information should be considered when selecting materials for use with VX 456[®] chemical oxidizer.

Tanks

Tanks should be of closed construction to prevent product contamination. The tank gas space should be adequately vented.

Tank materials of construction:

- Fiberglass reinforced vinyl ester plastic, color natural, with UV protection.
- High density crosslinked polyethylene (XLPE) with a minimum specific gravity (SPG) of 1.90
- Titanium

Siemens does not recommend storing VX 456[®] in either carbon steel¹, 304L² or 316L stainless containers. (See Table 1 for Materials of Compatibility summary).

Pumps

Pumps are a typical source of leakage around glands and packing. This type of spillage should be promptly cleaned up and the area washed down with water. The water should then be drained into an industrial wastewater discharge in your area. Greaseless lubricants should be used in areas where spilled material or dust from dried material may come in contact with the lubricants or the housings containing those lubricants.

Pumps should not be run against closed valves. This may result in the heating the VX 456[®] above its decomposition temperature.

Pump materials of construction (Wetted Parts)

- 316 SS (Routine inspection recommended)
- Polypropylene

Seal Types:

- Continually running = Dynamic
- Start/ Stop = Double mechanical

Piping

Design the piping system to avoid space that may trap gases. The piping system should be designed to accommodate thorough flushing or complete drain down especially in cold climates where low temperatures may induce crystallization of the liquid in the piping system.

Piping materials of construction:

- CPVC
- Vinyl Ester FRP
- Teflon lined pipe
- Schedule 80 PVC

Heat tracing and insulation (calcium silicate or equivalent) may be appropriate where the solution freezing point is exceeded. However, if that approach is used a temperature controller should be used to keep from generating any "hot" spots in the piping. Heat tracing temperature setting should be specific for the product being used.

References

1. Occidental Chemical Corporation, *Corrosion of Carbon Steel with VX 456[®]*, 06/24/1999.
2. Occidental Chemical Corporation, *Corrosion of Stainless Steel with VX 456[®]*, 5/14/1999.

Table 1: Guideline for VX 456® Chemical Oxidizer Materials of Compatibility

Material Type		Compatibility with VX -456®
Metals	Carbon Steel	No
	314 L Stainless	No
	316 L Stainless	No (A)
	Hastalloy C	No Data
	Titanium	Yes
Seals	Ceramic	No Data
	Carbon	No Data
Elastomers	Buna-N (Nitrile)	No
	EPDM	No
	Neoprene (Personal Protective Equipment)	Yes
Plastics	Viton	Yes (B)
	CPVC	< 180°F
	Duraplast (ABS)	No Data
	Epoxy	No Data
	Halar	< 212°F
	HD Linear Polyethylene (HDPE)	No
	Kynar	Yes
	Polyethylene Crosslinked (XLPE)	Yes (C)
	Polypropylene (PP)	< 75°F
	Polysulfone	No Data
	Polyvinylidene Fluoride (PVDF)	< 140°F
	PTFE (Teflon)	< 400°F
	Schedule 80 PVC	Yes
Vinyl ester FRB	Yes	

The information contained within this table is supplied as a guideline only. The information is based upon industry data available for the individual components of the product VX 456®. Siemens has not performed extensive testing on the compatibility of the product VX 456® with any of these materials and therefore makes no warranties to its compatibility, implied or otherwise, with such materials.

Notes:

(A) Corrosion testing of VX 456® and 316L stainless showed that VX 456® could be stored in 316L stainless containers; however, caution and frequent examinations would be mandatory for such use, therefore, Siemens advises against it.

(B) Information is for exposure at 21°C (70°F) and 72 hours. Viton is the minimum seal specification for use with sodium chlorite solutions and blends. Seals should be inspected at a minimum yearly and replaced if the seal shows any signs of compromise.

(C) XLPE for tank construction should have a minimum specific gravity (SPG) of 1.90.

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