Product Note, PN 451
AP 64 Seal Compatibility

June 29, 2021

The chart below provides seal material compatibility recommendations for the AP 64 check valve. The standard seat material is FKM with Neoprene (NP) being an option.

Gas Name	**Molecular Formula**	**AP 64 Seal Recommendation** NP=Neoprene X = Unknown
Acetylene	C2H2	FKM
Air		FKM
Ammonia	NH3	NP
Argon	Ar	FKM
Arsine	AsH3	FKM
Boron Trichloride	BCl3	FKM
Boron Trifluoride	BF3	FKM
Boron 11 Trifluoride	11BF3	FKM
Butene-1	C4H8	FKM
Carbon Dioxide	CO2	FKM
Carbon Monoxide	CO	FKM
Chlorine	Cl2	FKM
Chlorine Trifluoride	ClF3	FKM
Dichlorsilane	SiH2Cl2	FKM
Dimethylsilane	(CH3)2SiH2	X
Disilane	Si2H6	FKM
Ethylene	C2H4	FKM
Fluorine	F2	FKM
Germane	GeH4	FKM
Halocarbon 114	C2Cl2F4	NP
Halocarbon 115	C2ClF5	NP
Halocarbon 116	C2F6	FKM
Halocarbon 125	C2HF5	FKM
Halocarbon 134A	C2H2F4	NP
Halocarbon 12	CCl2F2	NP
Halocarbon 12B2	CBr2F2	X
Halocarbon 13	CClF3	NP
Halocarbon 13B1	CBrF3	X

Gas Name	Molecular Formula	AP 64 Seal Recommendation NP=Neoprene X = Unknown
Halocarbon 14	CF4	FKM
Halocarbon 21	CHCl2F	FKM
Halocarbon 23	CHF3	FKM
Halocarbon 32	CH2F2	FKM
Halocarbon C318	C4F8	NP
Halocarbon R218	C3F8	X
Helium	He	FKM
Hydrogen	H2	FKM
Hydrogen Bromide	HBr	FKM
Hydrogen Chloride	HCl	FKM
Hydrogen Fluoride	HF	FKM
Hydrogen Selenide	H2Se	FKM
Hydrogen Sulfide	H2S	FKM
Krypton	Kr	FKM
Methane	CH4	FKM
Methanol	CH3OH	NP
Methyl Chloride	CH3Cl	FKM
Methysilane	CH3SiH3	X
Methyl Fluoride	CH3F	FKM
Neon	Ne	FKM
Nitric Oxide	NO	FKM
Nitrogen	N2	FKM
Nitrogen Trifluoride	NF3	FKM
Nitrous Oxide	N2O	FKM
Octaflourocyclopentene	C5F8	X
Oxygen	O2	FKM
Perfluorpropane	C3F8	FKM
Perfluorobutadiene	C4F6	X
Phosphine	PH3	FKM
Phosphorous Pentafluoride	PF5	X
Propane	C3H8	FKM
Propene	C3H6	X
Silane	SiH4	FKM
Silicone Tetrachloride	SiCl4	X
Silicon Tetrafluoride	SiF4	NP
Sulfur Dioxide	SO2	FKM
Sulfur Hexafluoride	SF6	FKM
Sulfur Tetrafluoride	SF4	FKM
Trichlorsilane	HSiCl3	FKM
Trimethylsilane	(CH3)3 SiH	FKM
Tungsten Hexafluoride	WF6	X
Xenon	Xe	FKM

Cautions:

1) A seal noted as ‘unknown’ means that the compatibility of an available seal material is not advisable or not known. The material may or may not be compatible.
2) Check valve is a safety device to prevent reverse flow. It should be utilized for safety and not primary operation of the gas system like a shut off valve.
3) The check valve seal material may react with the process gas and impede the device’s operation, even if the gas is deemed compatible with the seal material. Higher gas pressures may compound the effect. The reaction can cause a change in the cracking pressure and/or a flow restriction.
4) Check valves should not be installed directly downstream of a pressure regulator as this may affect the pressure regulation. Check valves, if installed in close proximity to a pressure regulator, should be located upstream of the pressure regulator.
5) A check valve should seal across the seat if the differential pressure inlet to outlet is less than cracking pressure of the device, trapping pressure on the upstream side. A differential pressure of the cracking pressure is required to allow forward flow.
6) A pressure regulator can prevent reverse flow in some circumstances, but should not be considered a safety device or a check valve.
7) Welding a check valve with tube stub connections requires special care compared to other devices to maintain purge gas flow during welding.
8) Material chemical compatibility based upon published recommendations from others and actual usage. AP Tech does not have the capability to evaluate or test with gases other than N2, He and CDA.