

# Materials and Applications Suitability Matrix

## Oil & Gas Production & Transmission

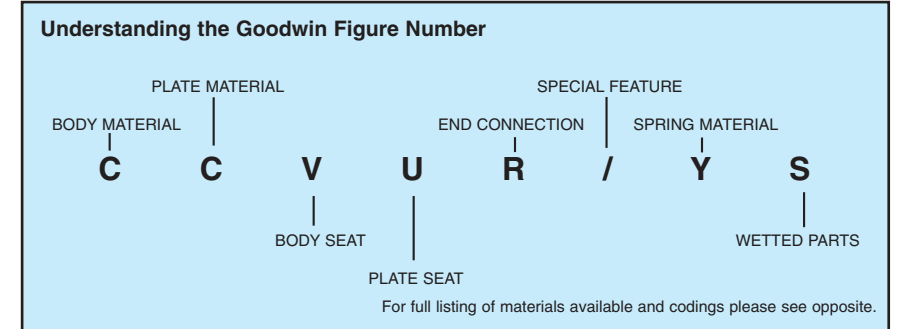
Figure Number Body Material API 600 Trim Number Temperature Range - Deg C Temperature Range - Deg F	CARBON STEEL					LOW TEMP CARBON STEEL			STAINLESS STEEL				NON-FERROUS		DUPLEX			NICKEL ALLOYS				TITANIUM
	CEPPR-YE	CEEPR-YE	CEVPR-YE	CEUPR-YE	CEUUR-YE	OSSPR-YS	OSVPR-YS	OSUUR-YS	SSPPR-YS	SSVPR-YS	SSUUR-YS	YPPR-YS	AAPPR-YI	AANPR-YI	QOPPR-YI	QOUUR-YI	ZZPPR-YI	IIPR-YI	IUIUR-YI	OIIPR-YI	TIIPR-TT	
	WCB	WCB	WCB	WCB	WCB	LCC	LCC	LCC	CF8M	CF8M	CF8M	CF8C	AB2	AB2	S31803	S31803	S32760	INCONEL 625	INCONEL 625	LCC/625 CLAD	TITANIUM	
1	1	1	1	1	1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
8	8	8	8	8	8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
29°C to 399°C	-29°C to 399°C	-29°C to 204°C	-29°C to 399°C	-29°C to 399°C	-29°C to 399°C	-46°C to 399°C	-40°C to 204°C	-46°C to 399°C	-200°C to 815°C	-40°C to 204°C	-200°C to 815°C	-200°C to 871°C	-198°C to 232°C	-57°C to 121°C	-46°C to 250°C	-46°C to 250°C	-46°C to 250°C	-198°C to 482°C	-198°C to 482°C	-46°C to 399°C	-46°C to 260°C	
-20°F to 750°F	-20°F to 750°F	-20°F to 399°F	-20°F to 750°F	-20°F to 750°F	-20°F to 750°F	-51°F to 750°F	-40°F to 399°F	-51°F to 750°F	-328°F to 1500°F	-40°F to 399°F	-328°F to 1500°F	-328°F to 1600°F	-325°F to 450°F	-76°F to 250°F	-51°F to 482°F	-51°F to 482°F	-51°F to 482°F	-324°F to 900°F	-324°F to 900°F	-51°F to 750°F	51°F to 500°F	
Crude Oil - Sweet Non-Abrasive	2	1	1	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crude Oil - Sweet & Abrasive	4	3	3	2	1	4	4	1	4	4	0	4	4	4	0	0	0	4	4	4	0	
Crude Oil - Sour Non-Abrasive	2	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	10	1	0	
Crude Oil - Sour & Abrasive	4	4	4	3	2	4	4	2	4	4	0	4	4	4	3	1	3	4	1	4	0	
Gas, Hydrocarbon - Sweet Non-Abrasive	2	1	1	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gas, Hydrocarbon - Sweet & Abrasive	4	3	3	2	1	4	4	1	4	4	0	4	4	4	0	0	0	4	4	4	0	
Gas, Hydrocarbon - Sour Non-Abrasive	2	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	
Gas, Hydrocarbon - Sour & Abrasive	4	4	4	3	2	4	4	2	4	4	0	4	4	4	3	1	3	4	1	4	0	
Hydrocarbon Liquids - Sweet Non Abrasive	2	1	1	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hydrocarbon Liquids - Sweet & Abrasive	4	3	3	2	1	4	4	1	4	4	0	4	4	4	0	0	0	4	4	4	0	
Hydrocarbon Liquids - Sour Non Abrasive	2	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hydrocarbon Liquids - Sour & Abrasive	4	4	4	3	2	4	4	2	4	4	0	4	4	4	3	1	3	4	1	4	0	
Compressed Air	2	2	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fuel - Diesel	2	2	2	0	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	
Fuel - Gas	2	2	2	0	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	
Instrument Air	3	3	3	3	3	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	
Lube Oil	2	2	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nitrogen (or other inert gas)	2	2	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Seawater Fire Service	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	
Seawater Injection	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	
Water (Effluent) - Foul	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	2	0	0	0	0	
Water (Potable)	4	4	4	4	4	3	3	3	1	1	0	4	1	1	0	0	0	0	0	0	0	
Water Injection (Sour)	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	1	1	1	0	

## Refining, Transmission & Petrochemical

Figure Number Body Material API 600 Trim Number Temperature Range - Deg C Temperature Range - Deg F	CARBON STEEL					LOW TEMP CARBON STEEL			CHROME STEEL			STAINLESS STEEL			NON-FERROUS		NICKEL ALLOYS			
	CEPPR-YE	CEEPR-YE	CEVPR-YE	CEUPR-YE	CEUUR-YE	OSSPR-YS	OSVPR-YS	OSUUR-YS	DEPPR-YE	PEPPR-TE	WEPPR-YE	SSPPR-YS	SSVPR-YS	SSUUR-YS	AAPPR-YI	AANPR-YI	IIPPR-YI	IUIUR-YI	OIIPR-YI	
	WCB	WCB	WCB	WCB	WCB	LCC	LCC	LCC	WC6	C5	C12	CF8M	CF8M	CF8M	AB2	AB2	INCONEL 625	INCONEL 625	LCC-625 CLAD	
1	1	1	1	1	1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
29°C to 399°C	-29°C to 399°C	-29°C to 204°C	-29°C to 399°C	-29°C to 399°C	-29°C to 399°C	-46°C to 399°C	-40°C to 204°C	-46°C to 399°C	-29°C to 539°C	-29°C to 539°C	-29°C to 539°C	-200°C to 815°C	-40°C to 204°C	-200°C to 815°C	-198°C to 232°C	-57°C to 121°C	-198°C to 482°C	-198°C to 482°C	-46°C to 399°C	
-20°F to 750°F	-20°F to 750°F	-20°F to 399°F	-20°F to 750°F	-20°F to 750°F	-20°F to 750°F	-51°F to 750°F	-40°F to 399°F	-51°F to 750°F	-20°F to 1100°F	-20°F to 1100°F	-20°F to 1100°F	-328°F to 1500°F	-40°F to 399°F	-328°F to 1500°F	-325°F to 450°F	-76°F to 250°F	-324°F to 900°F	-324°F to 900°F	-51°F to 750°F	
Crude Oil - Sweet Non-Abrasive	2	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0
Crude Oil - Sweet & Abrasive	4	3	3	2	1	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4
Crude Oil - Sour Non-Abrasive	2	1	1	0	0	2	2	0	2	2	0	0	0	0	0	0	0	1	0	1
Crude Oil - Sour & Abrasive	4	4	4	3	2	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4
Hydrocarbon Liquids - Sweet Non Abrasive	2	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0
Hydrocarbon Liquids - Sweet & Abrasive	4	3	3	2	1	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4
Hydrocarbon Liquids - Sour Non Abrasive	2	1	1	0	0	2	2	0	2	2	0	0	0	0	0	0	0	1	0	1
Hydrocarbon Liquids - Sour & Abrasive	4	4	4	3	2	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4
Instrument Air	3	3	3	3	3	3	3	3	0	0	0	2	1	0	0	0	0	0	0	0
Water Potable	4	4	4	4	4	3	3	3	4	4	4	1	1	0	1	1	0	0	0	0

## Gas Liquefaction & LNG

Figure Number Body Material API 600 Trim Number Temperature Range - Deg C Temperature Range - Deg F	LOW TEMP CARBON STEEL				STAINLESS STEEL		NON-FERROUS		DUPLEX		NICKEL ALLOYS	
	OSSPR-YS	OSUUR-YS	77PPR-YS	22PPR-YS	SSPPR-YS	YPPR-YS	AAPPR-YI	MMPPR-MM	QOPPR-YI	ZZPPR-YI	IIPPR-YI	OIIPR-YI
	LCC	LCC	LC1	LC3	CF8M	CF8C	AB2	MONEL	S31803	S32760	INCONEL 625	LCC/625 CLAD
10	10	10	10	10	10	10	10	10	10	10	10	10
-46°C to 399°C	-46°C to 399°C	-59°C to 343°C	-101°C to 343°C	-200°C to 815°C	-200°C to 815°C	-198°C to 232°C	-198°C to 204°C	-46°C to 250°C	-46°C to 250°C	-198°C to 482°C	-46°C to 399°C	
-51°F to 750°F	-51°F to 750°F	-75°F to 650°F	-150°F to 650°F	-328°F to 1500°F	-328°F to 1600°F	-325°F to 450°F	-325°F to 400°F	-51°F to 482°F	-51°F to 482°F	-324°F to 900°F	-51°F to 750°F	
Liquid Argon	5	5	5	5	1	0	0	0	0	0	0	0
Liquid Hydrogen	5	5	5	5	1	0	0	0	0	0	0	0
Liquid Nitrogen	5	5	5	5	1	0	0	0	0	0	0	0
Liquid Oxygen	5	5	5	5	1	0	0	0	0	0	0	0
LNG at -161 Deg C	5	5	5	5	1	0	0	0	0	0	0	0
Butane	1	1	0	0	0	0	0	0	0	0	0	0
LPG	1	1	0	0	0	0	0	0	0	0	0	0
Propane	1	1	0	0	0	0	0	0	0	0	0	0



## Desalination & Water Transmission

Figure Number Body Material API 600 Trim Number Temperature Range - Deg C Temperature Range - Deg F	CARBON STEEL		STAINLESS STEEL				CAST IRON		DUCTILE IRON		NI-RESIST				NON-FERROUS			
	CAXPR-SS	CAXPR-II	SSPPR-SS	SSPPR-II	SSVPR-SS	SSVPR-II	XAXPF-MM	XAXPF-II	9ANPF-MM	9ANPF-II	88PPR-SS	88PPR-II	88NPR-SS	88NPR-II	AAPPR-MM	AAPPR-II	AANPR-MM	AANPR-II
	WCB / LINED	WCB / LINED	CF8M	CF8M	CF8M	CF8M	C IRON LINED	C IRON LINED	DUCTILE IRON	DUCTILE IRON	A439 D2	A439 D2	A439 D2	A439 D2	AB2	AB2	AB2	AB2
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
-29°C to 121°C	-29°C to 121°C	-200°C to 815°C	-200°C to 815°C	-40°C to 204°C	-40°C to 204°C	-29°C to 121°C	-29°C to 121°C	-29°C to 121°C	-29°C to 121°C	-29°C to 399°C	-29°C to 399°C	-29°C to 121°C	-29°C to 121°C	-198°C to 232°C	-198°C to 232°C	-57°C to 121°C	-57°C to 121°C	
-20°F to 250°F	-20°F to 250°F	-328°F to 1500°F	-328°F to 1500°F	-40°F to 399°F	-40°F to 399°F	-20°F to 250°F	-20°F to 250°F	-20°F to 250°F	-20°F to 250°F	-20°F to 750°F	-20°F to 750°F	-20°F to 250°F	-20°F to 250°F	-325°F to 450°F	-325°F to 450°F	-76°F to 250°F	-76°F to 250°F	
Brine (De Oxygenated)	2	1	1	0	1	0	2	0	2	0	1	0	0	1	0	1	0	
Brine (Oxygenated)	4	2	4	4	4	4	3	2	3	2	4	1	4	4	4	4	4	
Distillate	1	0	1	0	1	0	0	0	1	0	0	0	0	1	0	1	0	
Seawater, Flowing	2	0	2	0	2	0	2	0	2	0	1	0	1	0	1	0	0	