Key to Selection Pages

Fluid Data

Fluid Properties

The first four columns after the sealed fluid column provide data on the melting point, boiling point, specific gravity, seal temperature, and hazard codes for each of the fluids listed. The data provided is for pure fluids only and may not be applicable to solutions or compositions.

If a concentration range is not stated for any fluid listed, the recommended materials apply regardless of the fluid concentration.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER													
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T
											B	A	G	D	X	X	Q	W	X	P	H	X	X
											130	134	135	461	394	230	138	139	212	334	033	208	611
Acetaldehyde		-124	20	.8	-40 / 100	T1F2	S	F2	N1	Q2			●				●	●	●	●	●		●
Acetic Acid	<30%	17	118	1.0	0 / 60	C1F1	S	F2	N1	Q2			●		●	●	●	●	●	●	●		●
Acetic Acid	>30%				0 / 120	T1C2F1	S	F2	N1	Q2			●				●	●	●		●		
					0 / 200	T1C2F1	D	F4	N1	Q1							●	●	●				
Acetic Anhydride	<15%	-73	139	1.1	-20 / 150	T2C2F1W2	D	F4	N1	Q1					●	●	●	●	●		●		
Acetone		-94	56	.8	-20 / 100	T1F2	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●
Acetone Cyanohydrin		-20	82	.9	-20 / 82	T2F1	D	F4	N1	Q1					●	●	●	●	●		●		
Acetonitrile		-41	82	.8	-40 / 100	T1F1	S	F2	N1	Q2			●				●	●	●	●	●	●	●

Melting and Boiling Points

The temperature in degrees Celsius is given for the melting point, i.e. the temperature below which the fluid will solidify at atmospheric pressure, and for the atmospheric boiling point, i.e. the temperature at which the fluid will vaporise. The melting and boiling points stated are for pure fluids, except for aqueous solutions which are given as 0 & 100°C respectively.

The vapour pressure of a fluid becomes an important factor in seal selection when fluids are handled at temperatures near their boiling point at pumping pressure. If the temperature of the fluid is higher than 20°C below the atmospheric boiling point of the fluid, John Crane should be consulted before selection and use of a seal.

Specific Gravity

The specific gravity or relative density for each fluid is provided.

Temperature

Where appropriate, the fluid operating temperature in the seal area has been divided into temperature bands. The bands provided should cover virtually all possible operating temperatures for each fluid. If a seal selection is not provided for a required operating temperature, John Crane should be consulted before selection and use of a seal.

Hazard Codes

If a fluid to be sealed is likely to present any form of hazard, it is identified and the type and degree of hazard stated. It is possible for a fluid to present more than one hazard and these are described below. Generally the hazards shown are for the pure substance even if the quoted duty is dilute, because leakage will evaporate to leave concentrated deposits.


TOXIC

Toxic

T1 The fluid has a moderate level of toxicity.
T2 The fluid is either highly toxic, poisonous or carcinogenic.
T3 The fluid is either extremely toxic or carcinogenic.


CORROSIVE

Corrosive

C1 The fluid has a mild corrosive effect on human skin and tissue.
C2 The fluid has a highly corrosive effect on human skin and tissue.


FLAMMABLE

Flammable

F1 The fluid is likely to combust when exposed to either heat or flame.
F2 The fluid is highly flammable and will combust when exposed either to heat or flame.


WATER REACTION

Water Reactive

W1 The fluid may react when exposed to water or moisture.
W2 The fluid will have a severe adverse reaction when exposed to water or moisture.


OXIDISING

Oxidising

O1 The fluid may produce an oxidising reaction to organic materials.
O2 The fluid produces a strong oxidising reaction to organic materials.


EXPLOSIVE

Explosive

E2 The fluid will be explosive when exposed to either heat or flame.


SPONTANEOUS COMBUSTION

Spontaneous Combustion

S2 The fluid will react spontaneously in air without any external influence.

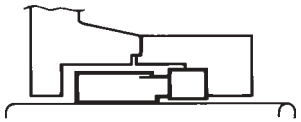
Installation Arrangements

Arrangement

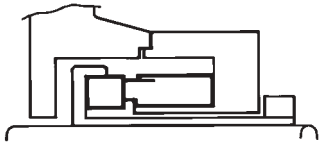
Wherever possible the recommended sealing solution is a single seal, but if a fluid concentration and temperature band present a significant hazard, the recommended solution will be for a single seal with a containment device, or, in extreme cases, a dual seal arrangement, with either a pressurised barrier fluid or unpressurised buffer fluid. Dual seal arrangements may also be recommended in cases where there are no suitable materials for a single seal solution.

S – Single Seal

A single seal mounted internally

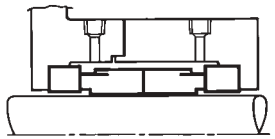


A single seal mounted in a stationary position with the seat/mating ring rotating



D – Dual Seal

A dual seal installation where the seals are mounted in a back-to-back configuration



A dual seal installation where the seals are mounted in a tandem configuration

Key to Selection Pages

Flush and Neck Arrangements

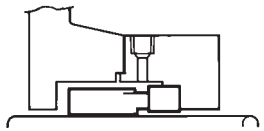
Flush

A flush is usually clean pumped fluid which is injected into the seal chamber. If necessary, the fluid may pass through a cyclone separator or strainer to ensure that it is clean and free from debris or abrasive matter. Certain applications may require a clean compatible fluid injection from an external source. There are five different seal flush configurations or piping plans, and the recommended flush is stated for each fluid concentration and operating temperature band. API Plan numbers are quoted for each flush configuration in the following examples, and more details of API plans are provided on page 44.

F1 – No Flush

No seal flush to be installed, i.e. dead ended seal chamber with vent.

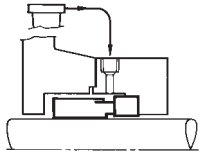
API Plan 02



F2 – Product Recirculation

Recirculation of the pumped product either from the pump discharge to the seat/face area of the seal, or from the seat/face areas of the seal to the pump suction.

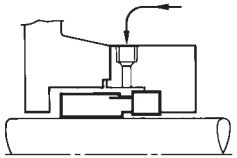
API Plans 01, 11, 13 and 21



F3 – Clean Flush

A flow of clean fluid to the seat/face area of the seal. The fluid can be either pumped fluid recirculated through a strainer or cyclone separator, or a clean compatible fluid from an external source.

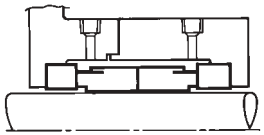
API Plans 12, 22, 31, 32 and 41



F4 – Dual Seal, Pressurised Barrier

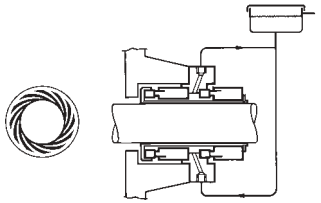
A pressurised and circulated barrier fluid or gas from an external reservoir for use with a dual seal pressurised arrangement. The barrier fluid must be clean and compatible with the fluid being pumped.

API Plans 53A, 53B, 53C, 54, 74



F5 – Upstream Pumping

A non-pressurised buffer fluid from an external source for use with an Upstream Pumping seal installation. The buffer fluid must be clean and compatible with the fluid being pumped.



Neck

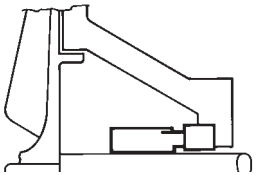
In certain circumstances a particular neck arrangement at the inboard end of the seal chamber may be recommended to control the fluid flow in or out of the seal chamber. Existing equipment may require modification to achieve the best seal performance.

N1

No special neck requirements

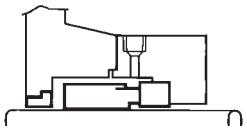
N2

An open large bore or open tapered seal housing is recommended



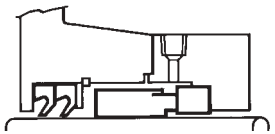
N3

A moderate neck restriction is required in the form of a close clearance neck bush



N4

A severe neck restriction is required in the form of a lip seal or similar device



Secondary Containment

Note: Liquid quenches Q4 and Q5 must be piped in at bottom dead centre of the quench gland and out at top dead centre.
Steam quenches Q4 and Q5 must be piped in at top dead centre of the quench gland and out at bottom dead centre.

Secondary Containment

An external seal quench arrangement may be recommended for reasons of either safety, in the form of secondary containment, or to achieve optimum seal performance by use of a liquid or steam quench.

The selection pages refer to seven different secondary containment arrangements, and explanations of these are given below.

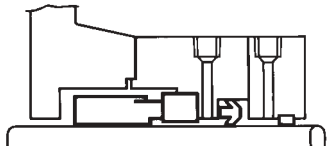
Q1

No external quench facility required

Q2 – Leakage Containment

A quench gland which is designed to operate as a seal failure control device, diverting leakage to either a safe area drain or to a flare.

The minimum requirement for failure control is a fixed throttle bush, but its ability to contain liquid or vapour emissions is relatively poor. Depending upon the fluid to be sealed, it is common practice to up-grade the method of containment to a higher integrity device such as an FS Lip Seal, or a floating or segmented bush. These seals can be installed in conjunction with an alarm or other seal failure indicator.



Q2

For particularly hazardous fluids, it may be preferable to up-grade the recommended quench arrangement from Q2 to Q6, a dual unpressurised seal arrangement.

API Plan 61

Q3 – Static Quench

A quench gland with provision for a static clean liquid quench such as an oil barrier.

The quench gland should be sealed with a quench containment seal or lip seal, and the liquid level should be maintained at all times by a device such as a constant level oiler.

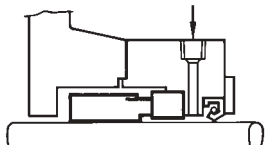
API Plan 51

Q4 – Intermittent Quench

A quench gland with provision for an intermittent clean liquid or steam quench.

The quench gland should be sealed with a quench containment seal or a lip seal, and the liquid quench flow automatically regulated by a quench control device to minimise wastage of quench liquid. The outlet from the quench gland should be piped to a safe area drain.

API Plan 62



Q3, Q4 and Q5

Q5 – Continuous Quench

A quench gland which is fed with a continuous flow of liquid or steam.

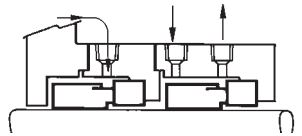
The recommended quench gland sealing device for a continuous flow of liquid is either a quench containment seal or a lip seal. For a continuous flow of steam the recommended quench seal is a segmental carbon bush, a floating bush, or a fixed throttle bush. The outlet from the quench gland should be piped to a safe area drain.

API Plan 62

Q6 – Unpressurised Dual Seal

An arrangement where a non-pressurised buffer fluid from an external source is circulated between the inboard and outboard seals. Alternatively, a dry running mechanical containment seal could be used.

The outboard seal materials must be suitable for sealing the pumped fluid.

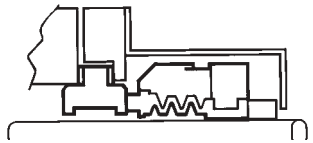


Q6

API Plans 51 and 52, 72, 75, 76

Q7 – Splash Guard

Externally mounted seals should be fitted with a splash guard incorporating a drain connection, in order to pipe any splash leakage to a safe area drain.



Q7

Selection Comments

Where appropriate, comments have been added to the selection pages beside the materials suitability chart. The comments are numbered, and a key to them is included on the fold-out page 44i/ii. Most of the comments are self-explanatory, but the descriptions for the most commonly used ones are as follows.

1 Refer to John Crane Where No Selection Shown

2 Confirm Selection at Very High Temperatures

Certain fluids/applications may require special treatment at very high temperatures - please consult John Crane.

3 Abrasive

The sealed fluid is likely to be of an abrasive nature. This has been taken into account by the preferred sealing solution.

4 Atmospheric Deposits

The sealed fluid may leave deposits on the atmospheric side of the seal. It is recommended that a Q3, Q4 or Q5 quench be used with an appropriate quench medium to prevent accumulation of these deposits.

5 Crystallises

Indicates that the fluid to be sealed is likely to crystallise on contact with atmosphere.

6 Clogging

Certain fluids may be of a fibrous or abrasive nature, which may under normal circumstances result in clogging of the seal. This has been taken into account by the preferred sealing solution.

7 Heated Environment

Indicates that the sealed fluid will solidify at normal temperatures, and therefore the pump/seal must be kept hot during operation and should be pre-heated before equipment start-up.

8 Avoid Springs in Product

Certain fluids may be of a fibrous or abrasive nature, which may under normal circumstances result in clogging of the seal. A seal design where the springs are not immersed in the fluid is preferred.

9 Stationary-Mounted Seal

A stationary-mounted seal with a rotating seat/mating ring is the preferred installation arrangement.

10 Vortex Breaker

The pump design should include a vortex breaker in the area of the seal.

11 Q5 – Steam Quench

A steam quench should be used. If the quench medium is not specified, water at ambient temperature is recommended.

12 Q5 – Hot Water Quench

A hot water quench should be used. If the quench medium is not specified, water at ambient temperature is recommended.

13 FDA Materials Available

For food-related or hygienic applications, Food and Drug Administration (FDA) approved materials are available and John Crane should be consulted if these are required.

14 Refer to Refinery Section

Refer to John Crane hydrocarbon processing brochure.

15 Refer to Pulp & Paper Section

Refer to John Crane pulp and paper processing brochure.

Selection Comments

16 Refer to Positive Displacement Pump Section

For positive displacement equipment solutions please refer to John Crane.

17 Consider Dry Gas Seal

Dry Gas seals may be a more economic solution on this application.

18 Check Refrigeration Oil Materials

Refrigeration oils present material compatibility problems. Please check compatibility with the materials selected for this application.

19 Check Refrigeration Fluid Materials

Refrigeration fluids present material compatibility problems. Please check compatibility with the materials selected for this application.

20 Refer to John Crane for Higher Temperatures and Exceptions

21 Alloy C-276 Acceptable for Springs

Springs and adaptive hardware in Alloy C-276 can be used if indicated. Thin section components such as the edge welded metal bellows are not suitable and should not be used.

22 Quench Fluid Contained by a Mech. Seal Above 80ºC

Refer to John Crane pulp and paper processing brochure.

23 Dry = >98%

Application is dry if concentration is 98% or higher.

24 Less Than 40% Gypsum

Gypsum content to be less than 40%. If above, consult John Crane.

25 From Wet Process

Refer to pure Phosphoric Acid production.

26 From Thermal Process

Refer to pure Phosphoric Acid production.

27 Pressure Surges C4 Stage

Refer to John Crane pulp and paper processing brochure.

28 See Seal Data Sheets for Specialised Face/Primary Ring Materials

Specialist materials may be appropriate. Consult relevant seal data sheet or brochure for available materials.

29 Dry = No water in Fluid

Water is not present in fluid.

30 < 2000ppm H_2S. Refer to John Crane for Higher Levels

If application contains greater than 2000ppm H_2S consult John Crane.

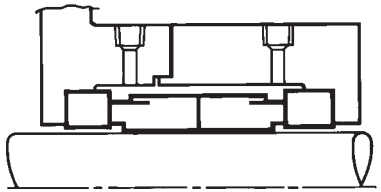
Dual and Multiple Seals

Introduction

Selection of Dual Seals

Where a 'D' dual seal configuration is recommended, it is necessary to select the seal type and materials for the outboard seal in addition to the inboard seal.

Pressurised Dual Seals – F4



Cross-Section of Pressurised Dual Seal

Inboard Seal – Sealed Liquid Side

The recommended seal materials for the inboard seal will be specified in the selection pages. However, when selecting a seal type, it should be remembered that the operating pressure of the seal will be the difference between the barrier fluid pressure and the sealed fluid pressure. This barrier fluid pressure should be maintained at a minimum of 1 bar g or 10 per cent above the sealed fluid pressure, whichever is the greater – see Chart 1.

Due to this low differential pressure, in normal operating conditions it is unlikely that a balanced seal type will be required. If, however, the pump or equipment to be sealed is likely to run dry with a consequential loss of sealed fluid pressure, it is essential that the pressure capability of the selected inboard seal is greater than the maximum pressure of the seal barrier fluid.

For most applications it is necessary to ensure that the sealed fluid is contained and barrier fluid contamination minimised. To achieve this the inboard seal must have a reverse pressure capability, for example the Type 8B1RP. If the barrier fluid pressure is lost, the inboard seal will not be forced open by the sealed fluid pressure. John Crane should be consulted before the selection and use of seals for these applications – see Figure 1.

Chart 1. Recommended Pressure

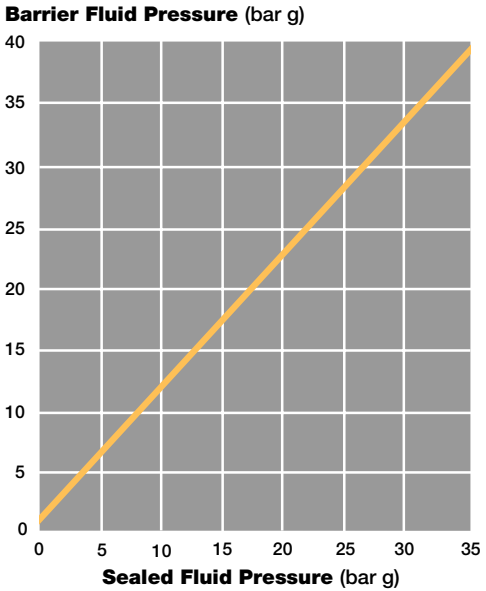
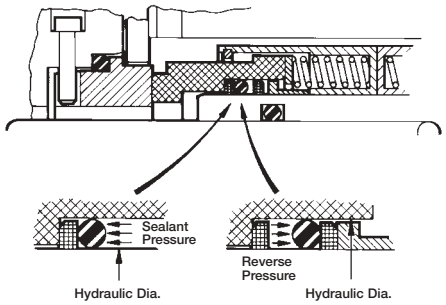


Figure 1



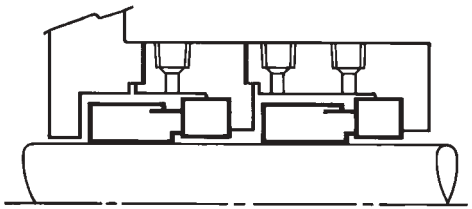
Outboard Seal – Atmosphere Side

Generally, the seal family chosen and materials recommended for the inboard seal are also suitable for the outboard seal. However, the pressure of the barrier fluid must be considered and may affect the outboard seal selection.

If the sealed fluid is considered to be only moderately hazardous or corrosive it may be possible to select the outboard seal materials to suit the barrier fluid being used in preference to the sealed fluid. This option should only be considered where any migration of sealed fluid into the barrier fluid presents no hazard. If there is any doubt about this, John Crane should be consulted before the selection and use of alternative outboard seal materials.

Unpressurised Dual Seals – Q6

In the case of non-pressurised dual seals, generally, both inboard and outboard seals used will be of the same family and material code.



Cross-Section of Non-Pressurised Dual Seal.

Upstream Pumping

An Upstream Pumping seal, which is supplied as a cartridge, is a multiple seal combining the benefits of both a pressurised and a unpressurised dual seal.

The materials selected for the inboard seal and the outboard seal should be suitable for the pumped fluid and the buffer fluid used.

Ancillary Fluid Control Equipment

Both pressurised and unpressurised dual seals require a fluid control system to manage the seal barrier/buffer fluid supply. The requirements of such a system are frequently tailored to suit the application and the operating plant requirements.

John Crane should be consulted before the selection and use of any fluid control equipment intended for use on hazardous applications.

Barrier/Buffer Fluids

Selection of a barrier/buffer fluid is important to the safe and reliable operation of all dual seal arrangements.

As the fluid selected will be forming the barrier between the sealed fluid and atmosphere, the fluid must be non-hazardous. The fluid must be clean, i.e. not containing debris or abrasive deposits. It must also be compatible with and at a temperature appropriate for the selected seal materials.

In the case of a pressurised dual and Upstream Pumping seals, the fluid must also be fully compatible with the sealed fluid because migration of the barrier/buffer fluid will occur.

Seal Material and Arrangement Guide

Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
											B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
											130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
Acetaldehyde		-124	20	.8	-40 / 100	T1F2	S	F2	N1	Q2			●				●	●	●	●	●		●	●	●	●	●	●	●		●	●			●		●	●	●	●	●	●	●		COMMENTS
Acetic Acid	<30%	17	118	1.0	0 / 60	C1F1	S	F2	N1	Q2			●		●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●	●	●	●		●	●	●	●		
Acetic Acid	>30%				0 / 120	T1C2F1	S	F2	N1	Q2			●				●	●	●		●			●	●	●	●	●		●							●	●		●	●		●		
					0 / 200	T1C2F1	D	F4	N1	Q1							●	●	●		●			●	●	●	●	●										●			●	●				
Acetic Anhydride	<15%	-73	139	1.1	-20 / 150	T2C2F1W2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●			●	●	●						●			●	●		●	●	
Acetone		-94	56	.8	-20 / 100	T1F2	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Acetone Cyanohydrin		-20	82	.9	-20 / 82	T2F1	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●	●	●	●		●				●		●	●		●	●	●	●		
Acetonitrile		-41	82	.8	-40 / 100	T1F1	S	F2	N1	Q2			●				●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●				●	●	●	●	●	●	●		
					-20 / 100	T1F1	S	F2	N1	Q2		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●				●	●	●	●	●	●	●		
Acetyl Chloride		-112	51	1.1	-20 / 51	T2C2F2W1	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●	●		●								●	●		●	●		●		
Acetyl Chloride	Dry				-20 / 51	T2C2F2W1	D	F4	N1	Q1		●			●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●		●	●	29
Acetylene, Gas		-81	-84	1.2	-40 / 25	T1F2	D	F4	N1	Q1	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
					-20 / 25	T1F2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Acrylic Acid		12	141	1.1	0 / 40	T2C2F1	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●	●		●	●					●		●	●		●	●	●	●		6
					0 / 140	T2C2F1	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●			●	●			●					●			●	●	●	●		6
Acrylonitrile		-83	77	.8	-40 / 80	T2C2F2	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6
					-20 / 80	T2C2F2	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Adipic Acid	<5%	152	-	1.4	0 / 100	T1	S	F2	N1	Q5	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●			●	●		●	●	●	●	●		7,11
Adipic Acid	Dry				152 / 215	T1	S	F1	N1	Q5					●	●	●	●	●		●	●	●	●	●	●	●		●	●		●	●			●			●		●	●	●	●		29
					152 / 260	T1	S	F1	N1	Q5						●	●	●	●		●	●	●		●	●	●		●	●		●	●			●			●		●	●	●	●		
Alcohol (see Ethyl Alcohol)																																													
Aluminium Acetate		-	-	1.0	0 / 40		S	F2	N1	Q5			●		●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●	●	●	●		●	●	●	●		5
					0 / 100		S	F2	N1	Q5			●		●	●	●	●	●	●	●		●	●	●	●	●				●						●	●		●	●		●		
Aluminium Chloride	<10%	-	-	2.4	0 / 60	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●			●								●	●		●	●		●		5
					0 / 100	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●			●								●	●		●	●		●		
Aluminium Chloride	<95%				0 / 100	T1C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●		●			●		●	●			●								●	●		●	●		●		
Aluminium Nitrate		0	100	1.0	0 / 100	O2	S	F1	N1	Q5	●	●	●	●	●	●	●	●	●					●		●	●										●	●		●	●				5,7
Aluminium Potassium Sulphate	<5%	0	-	1.0	0 / 30		S	F2	N1	Q1	●		●	●	●	●	●	●	●	●			●	●		●	●	●		●		●	●	●			●		●	●		●	●		●	5,7
					0 / 60		S	F2	N1	Q1	●		●	●	●	●	●	●	●	●			●	●		●	●	●		●		●	●	●			●		●	●		●	●		●	
Aluminium Potassium Sulphate	>5%				0 / 60		S	F2	N1	Q5	●		●	●	●	●	●	●	●					●		●	●			●		●	●	●					●	●		●	●		●	
					0 / 70		S	F2	N1	Q5	●		●	●	●	●	●	●	●					●		●	●			●		●	●	●					●	●		●	●		●	
					0 / 100		D	F4	N1	Q1	●		●	●	●	●	●	●	●					●		●	●												●	●		●	●			
Aluminium Sulphate	<5%	0	-	2.7	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●		●	●		●				●		●				●	●	●	●		●	●		●		5
					0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●		●	●		●				●		●				●	●	●	●		●	●		●		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
											B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
											130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																													COMMENTS
Aluminium Sulphate	<95%				0 / 60		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●			●		●				●		●	●	●	●	●		●		
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●			●		●				●		●	●	●	●	●		●		
Aminoacetic Acid	<5%	0	-	1.2	0 / 30		S	F2	N1	Q1							●	●	●		●			●		●	●		●	●			●					●	●		●	●	●	●		5,13
					0 / 60		S	F2	N1	Q1							●	●	●		●			●		●	●		●	●			●					●	●		●	●	●	●		
Aminoacetic Acid	>5%				0 / 60		S	F2	N1	Q5							●	●	●		●			●		●	●		●	●			●					●	●		●	●	●	●		
					0 / 100		S	F2	N1	Q5							●	●	●		●			●		●	●		●	●			●					●	●		●	●	●	●		
Aminoethanol (see Ethanolamine)																																													
Ammonia Water (see Ammonium Hydroxide)																																													
Ammonia, Anhydrous		-78	-34	.8	-40 / 80	T2C1F1	D	F4	N1	Q1			●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●		●	●	●	●	●	
					-20 / 80	T2C1F1	D	F4	N1	Q1			●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●		●	●	●	●	●	
Ammonia, Gas		-78	-33	.8	-33 / 100	T2C1F1	D	F4	N1	Q1			●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	17
					-20 / 100	T2C1F1	D	F4	N1	Q1			●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	
Ammonium Acetate	<20%	0	-	1.1	0 / 30		S	F2	N1	Q1			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	5
					0 / 60		S	F2	N1	Q1			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●			●	●		●	●	●	●	●	
Ammonium Acetate	>20%				0 / 60		S	F2	N1	Q5			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●	
					0 / 100		S	F2	N1	Q5			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●	
Ammonium Bicarbonate	<12%	0	-	1.6	0 / 60	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●			●	●			●		●	●		●	●	●			5,13
Ammonium Bromide	<70%	0	-	2.4	0 / 100		D	F4	N1	Q1					●	●	●	●	●					●		●	●											●	●		●	●				3,5
Ammonium Carbonate	<60%	0	-	1.0	0 / 20		S	F2	N1	Q5					●	●	●	●	●	●		●	●	●	●	●	●		●			●	●		●	●		●	●		●	●	●			5
Ammonium Chloride	<40%	0	-	1.5	0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●			●							●	●	●		●	●		●		5
Ammonium Hydrogen Fluoride		0	-	1.2	0 / 100	T2C2	D	F4	N1	Q1							●		●								●											●	●			●				5,13
Ammonium Hydroxide	<30%	-77	30	.9	-20 / 20	T1C1	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
					-20 / 100	T1C1	S	F2	N1	Q2			●		●	●	●	●	●					●	●	●	●										●	●		●	●						
Ammonium Nitrate	<85%	-	-	1.7	0 / 100	O2E2	S	F2	N1	Q5	●		●	●	●	●	●	●	●	●			●	●		●	●			●		●	●			●		●	●		●	●				5
Ammonium Phosphate	<20%	0	-	1.6	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●		●	●		●	●	●	●		5
					0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●									●	●		●	●				
Ammonium Phosphate	<40%				0 / 40		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●		●	●		●	●	●	●		
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●									●	●		●	●				
Ammonium Phosphate	>40%				0 / 100		D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●	●	●	●												●	●		●	●				
Ammonium Stearate		75	-	.9	0 / 70		S	F2	N1	Q5	●			●	●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●					●	●		●	●	●	●		4,12
Ammonium Sulphate	<80%	0	-	1.8	0 / 100		S	F2	N1	Q5			●		●	●	●	●	●					●	●	●	●												●	●		●	●				5
Ammonium Thiocyanate	<40%	0	-	1.3	0 / 60	T1	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●		●	●			●	●				●	●	●	●		●	●		●	●		5
					0 / 100	T1	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●		●	●			●	●				●	●	●	●		●	●		●	●		
Ammonium Thiocyanate	>40%				0 / 100	T1	D	F4	N1	Q1					●	●	●	●	●					●		●	●												●	●		●	●				

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Amyl Acetate	-79	148	.9	-20 / 135	F1	S	F2	N1	Q2			●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	
Amyl Alcohol	-79	138	.8	-20 / 135	T1F2	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	
Aniline	-6	184	1.0	0 / 120	T2	D	F4	N1	Q1			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●		●	●	
Aniline Hydrochloride <20%	198	-	1.2	0 / 100	T2	D	F4	N1	Q1					●	●	●	●	●					●		●	●										●	●		●	●				5
Aqua Regia (see Nitrohydrochloric Acid)																																												
Arctic C Heavy (see Refrig Oils)																																												
Arctic C Light (see Refrig Oils)																																												
Argon, Gas	-189	-186	1.6	-40 / 25	T1	D	F4	N1	Q1	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
				-20 / 25	T1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Arsenic Acid <20%	36	-	2.3	0 / 100	T2C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●										●	●		●	●				5
Asphalt (see Crude Oil Residue)																																												
Asphalt Based Oil	-	-	.9	30 / 200	F1	S	F1	N2	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●		●	●	●	●	●	●	2,3,4,7,11
				30 / 400	F1	S	F1	N2	Q5									●	●	●	●	●		●		●	●	●	●	●	●	●					●		●	●	●	●	●	●	
Asphalt,Emulsified	-	-	1.0	0 / 200	F1	S	F1	N2	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●		●	●	●	●	●	●	3,4,6,11
Backwater (see Paper Stock 1%)																																												
Barium Chloride	962	-	3.9	0 / 100	T3C1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●		●			●		●	●			●									●	●		●	●		●		5
Barium Hydroxide <50%	78	-	2.2	0 / 100	T3C1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●		●	●	●			●		●	●		●	●		●		
Barium Nitrate	0	-	3.2	0 / 100	T3C1O2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●	●	●	●												●	●		●	●				
Beer	0	100	1.0	0 / 20		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●	●	
Beer Wort	-	100	1.0	0 / 100		S	F1	N2	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●	●	6
Beet Sugar	0	-	1.6	0 / 100		S	F1	N2	Q5	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	5,6,13
Benfield Solution (see Potassium Carbonate)																																												
Bentonite	0	100	1.0	0 / 100		S	F1	N2	Q5			●		●	●	●	●		●	●		●	●	●		●		●	●		●	●					●			●	●	●	●		3,4,6,8,9,10
Benzaldehyde	-26	179	1.0	-20 / 135	T1C1F1	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●	●	●	
				-20 / 175	T1C1F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●	●	●	
Benzene	6	80	.9	6 / 80	T2F2	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	
Benzenesulphonic Acid	44	-	1.0	0 / 20	T2C1	D	F4	N1	Q1		●			●	●	●	●	●	●			●	●		●	●										●	●		●	●				5
Benzoic Acid <5%	121	-	1.3	0 / 100	T1	S	F3	N1	Q5		●			●	●	●	●	●		●			●	●	●	●			●								●	●		●	●		●		3,13
Benzotrichloride	-5	221	1.4	0 / 20	T2C2F1W1	D	F4	N1	Q1					●	●	●	●	●	●		●	●	●		●	●		●			●	●	●	●	●	●	●	●		●	●	●			
				0 / 215	T2C2F1W1	D	F4	N1	Q1					●	●	●	●	●					●		●	●												●			●	●				
Benzotrifluoride	-29	102	1.2	-20 / 20	T3C2F2W2	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●		●	●			●		●	●	●	●	●		●	●	●	●	●	
				-20 / 102	T3C2F2W2	D	F4	N1	Q1					●	●	●	●	●					●		●	●												●	●		●	●				

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Biphenyl		70	256	1.0	70 / 120	T3C1	D	F4	N1	Q1		●			●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●			7		
					70 / 200	T3C1	D	F4	N1	Q1		●			●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●					
					70 / 215	T3C1	D	F4	N1	Q1					●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●					
					70 / 250	T3C1	D	F4	N1	Q1						●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●					
Bisphenol		153	220	1.2	153 / 220		S	F1	N1	Q5							●	●	●		●		●		●		●		●	●		●	●						●			●	●	●	●		4,7,11		
Bitumen (see Crude Oil Residue)																																															
Black Liquor, Kraft (see Black Liquor, Sulphate)																																															
Black Liquor, Sulphate	<10%	0	100	1.0	0 / 70	T1C1	S	F1	N2	Q2		●	●		●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●	●		●	●	●	●		3,5,6		
Black Liquor, Sulphate	>10%				0 / 125	T1C1	S	F1	N2	Q5		●			●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●			●	●	●	●				
Black Liquor, Sulphite (see Sulphite Waste Liquor)																																															
Blood		-	100	1.1	0 / 100		S	F1	N2	Q5							●			●	●		●	●		●	●	●	●	●		●	●			●	●			●	●	●	●		4,6		
Bonderite Solution (Zinc)		-	-	1.0	0 / 100	T2C2	D	F4	N1	Q1	●			●			●	●	●	●	●		●	●		●	●	●	●	●		●	●					●	●		●	●	●	●				
Boric Acid	<35%	0	-	1.4	0 / 100	T1C1	S	F3	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●		●	●	●	●	●		3		
Boric Acid	<55%				0 / 100	T1C1	S	F3	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●			●							●	●	●	●		●	●	●	●				
Boric Acid	>55%				0 / 100	T1C1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●	●	●	●											●	●		●	●							
Boron Trichloride		-107	13	1.4	-40 / 20	T2C2W2	D	F4	N1	Q1							●	●	●					●		●	●								●			●	●		●	●							
Boron Trifluoride		-129	-101	.0	-40 / 25	T2C2W2	D	F4	N1	Q1							●	●	●					●		●	●											●	●		●	●							
Brake Fluid (see Hydraulic Oil)																																															
Bromic Acid		-	100	3.3	0 / 100	T1C1O2	D	F4	N1	Q1					●	●	●	●	●								●											●	●		●	●							
Bromine, Gas		-7	59	3.1	58 / 100	T3C2O2	D	F4	N1	Q1		●			●	●		●	●								●											●	●		●	●							
Bromine, Gas	Dry				58 / 70	T3C2O2	D	F4	N1	Q1		●			●	●		●	●		●						●			●									●	●		●	●			●			17,29	
Bromine, Liquid		-7	59	3.1	0 / 58	T3C2O2	D	F4	N1	Q1		●			●	●	●	●	●								●											●	●		●	●							
Bromine, Liquid	Dry				0 / 58	T3C2O2	D	F4	N1	Q1		●			●	●	●	●	●		●						●			●	●								●	●		●	●			●	●		29	
Brown Stock (see Paper Stock)																																															
Bunker Oil (see Fuel Oil, Heavy)																																															
Butadiene		-109	-4	.6	-20 / 25	T2C1F2	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		6		
Butane, Gas		-138	-1	.6	-40 / 25	T1F2	D	F4	N1	Q1	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●		17		
					-20 / 25	T1F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Butane, Liquid		-138	-1	.6	-40 / 100	T1F2	D	F2	N1	Q6	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●				
					-20 / 100	T1F2	D	F2	N1	Q6	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Butanediol (1,2)		-50	194	1.0	-40 / 200	T1F1	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●				
					-20 / 200	T1F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●				
Butanediol (1,3)		-	207	1.0	0 / 200		S	F2	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Butanediol (1,4)		21	228	1.0	20 / 200	T1	S	F1	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		7		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
											B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
											130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Butanediol (2,3)		19	180	1.0	20 / 180	F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●	●	●	●		
Butanol-1 (see Butyl Alcohol (N))																																													
Butanol-2 (see Butyl Alcohol (Sec))																																													
Butene (see Butylene)																																													
Buttermilk		-	100	1.0	0 / 100		S	F1	N2	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●		●	●		●	●	●	●			4,6,12
Butyl Acetate (N)		-76	126	.9	-140/120	T1C1F1	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●		
					-20 / 120	T1C1F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●		
Butyl Acetate (Sec)		-	112	.9	0 / 112	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●		
Butyl Acetate (Tert)		-	96	.9	0 / 96	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●		
Butyl Acrylate		-64	-64	.9	-40 / 148	T2F1	D	F4	N1	Q1							●	●	●	●	●		●	●	●	●	●		●	●		●	●						●		●	●	●	●		
					-20 / 148	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●						●		●	●	●	●		
Butyl Acrylate (Tert)		-	120	.9	-40 / 120	T2F1	D	F4	N1	Q1							●	●	●	●	●		●	●	●	●	●		●	●		●	●						●	●	●	●	●	●		
					-20 / 120	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●						●	●	●	●	●	●		
Butyl Alcohol (N)	<10%	-80	118	.8	-20 / 100	T1F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Butyl Alcohol (Sec)	<15%	-115	100	.8	-20 / 100	T1F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Butyl Alcohol (Tert)		26	83	.8	25 / 100	T1F2	S	F1	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		7
Butyl Amine (N)		-49	77	.7	-40 / 100	T2C1F2	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		
					-20 / 100	T2C1F2	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Butyl Amine (Sec)		-104	65	.7	-40 / 100	T2F2	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		
					-20 / 100	T2F2	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Butyl Amine (Tert)		-68	45	.7	-40 / 100	T2C1F2	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		
					-20 / 100	T2C1F2	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Butyl Butyrate		-92	166	.9	-20 / 120	T1F1	S	F2	N1	Q2		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	●		13
					-20 / 165	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●			●	●	●	●	●	●		
Butylene		-185	-6	.6	-20 / 25	T1F2	D	F2	N1	Q6		●			●	●	●	●	●					●	●	●	●	●	●			●					●	●		●	●	●				
Butyric Acid		-5	164	1.0	0 / 150	T1C2F1	S	F2	N1	Q2			●		●	●	●	●	●		●			●	●	●	●			●								●			●	●		●		
Calcium Acetate	<30%	0	-	1.0	0 / 100		S	F3	N1	Q5			●		●	●	●	●	●		●	●		●	●	●	●		●	●		●	●	●		●	●	●	●		●	●		●	●		3,5
Calcium Acetate	<60%				0 / 100		S	F3	N1	Q5			●		●	●	●	●	●					●	●	●	●						●			●	●	●		●	●					
Calcium Bisulphite		0	100	1.1	0 / 100	T1C1	S	F2	N1	Q2		●			●	●	●	●	●					●	●	●	●		●			●	●				●	●		●	●	●	●			
Calcium Bromide		38	149	2.3	0 / 149		S	F1	N1	Q5					●	●	●	●	●		●			●		●	●			●								●			●	●		●			5,7
Calcium Carbonate	<5%	0	-	2.9	0 / 100		S	F1	N2	Q5	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●		●			●	●	●		●	●	●	●		●	●	●			3,5,8,9,10
Calcium Chlorate		0	100	2.7	0 / 100	T1O2E2	D	F4	N1	Q1					●	●	●	●						●		●	●											●	●		●	●					5,7
Calcium Chloride	<15%	772	-	2.2	-10 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●	●		●	●	●			●	●		●	●		●	●	●	●			5
Calcium Chloride	>15%				0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●	●		●								●	●		●	●		●			

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																												COMMENTS
Calcium Hydroxide	<55%	0	-	2.3	0 / 100	T1C1	S	F3	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●						●	●			●			●		3
Calcium Hypochlorite	<10%	0	-	2.3	0 / 40	T1C1O2	S	F2	N1	Q5		●	●		●	●	●	●			●						●			●						●	●		●	●			●		5,11
Calcium Nitrate		43	132	1.9	0 / 100	T1C1O2E2	S	F1	N1	Q5	●	●	●	●	●	●	●	●	●					●	●	●	●									●	●		●	●					5,7
Calcium Phosphate(Dibasic)		0	100	2.3	0 / 100		S	F1	N2	Q1	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●	●	●		●	●	●		●	●	●	●	●	●	3,7,8,9,10,13
Calcium Phosphate(Monobasic)		0	100	2.2	0 / 100		S	F1	N2	Q1	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	3,7,8,9,10,13
Calcium Phosphate(Tribasic)		0	-	3.1	0 / 100		S	F1	N2	Q1	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	3,8,9,10
Calgon		0	-	1.0	0 / 60		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●		●	●		●	●	●	●			5
					0 / 100		S	F2	N1	Q5	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●		●	●		●	●	●	●			
Camphene		50	159	.8	50 / 100	T1F1	S	F1	N1	Q5					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	7,11
					50 / 160	T1F1	S	F1	N1	Q5					●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●		●	●	●	●		●	●	●	●		●	
Cane Sugar (see Sugar, Syrup)																																													
Caprolactam		69	180	1.0	0 / 180	T2C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●		●	●			●					●		●	●	●	●	●		3,5,6,7
Carbamate		49	184	1.0	0 / 120	T2C2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●		●	●			●					●	●		●	●	●	●		3,5,6,7
					0 / 184	T2C2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●		●	●			●					●			●	●	●	●		
Carbolic Acid		41	-	1.1	0 / 100	T2C2	D	F4	N1	Q1		●			●	●	●	●	●		●			●	●	●	●			●								●	●		●	●		●		7
Carbolic Acid	Dry				41 / 120	T2C2	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●			●		●	●		●	●	●	●		29
					41 / 182	T2C2	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●			●		●			●	●	●	●		29
Carbon Dioxide, Gas		-	-79	1.5	-40 / 25	T1	D	F4	N1	Q1	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
					-20 / 25	T1	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Carbon Dioxide, Liquid		-	-79	1.1	-40 / 25	T1	S	F2	N1	Q2	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					-20 / 25	T1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Carbon Monoxide		-207	-190	1.0	-40 / 25	T2F2	D	F4	N1	Q1	●		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					-20 / 25	T2F2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Carbon Tetrachloride		-23	77	1.6	-20 / 77	T2	D	F4	N1	Q1		●			●	●	●	●		●				●	●	●	●	●		●	●					●	●	●		●	●		●	●	
Castor Oil		-10	313	1.0	-10 / 100	F1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		13
					-10 / 120	F1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		
Cat Cracker Slurry(FCCU)+H2S		93	470	1.0	93 / 200	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●			●	●	●	●		1,2,3,4,6,7,14,21,30
					93 / 315	T2F1	D	F4	N1	Q1						●			●		●		●				●		●	●		●	●					●			●	●	●	●		
					93 / 400	T2F1													●		●		●					●		●	●		●	●					●			●	●	●	●		
Caustic Soda (see Sodium Hydroxide)																																													
Cellosolve (see Ethylene Glycol)																																													
Cellulose (see Paper Stock)																																													
Cement Slurry		0	100	1.0	0 / 35		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●				●	●		●	●	●	●		3,4,6,8,9,10
China Wood Oil (see Tung Oil)																																													

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
Chloric Acid	<10%	-	40	1.0	0 / 20	T2C2O2	D	F4	N1	Q1				●	●	●	●	●		●						●			●							●	●		●	●		●		
Chloric Acid	>10%				0 / 40	T2C2O2	D	F4	N1	Q1				●	●	●	●	●								●											●	●		●	●				
Chlorine Dioxide		-60	10	1.0	-40 / 100	T2C2F2O2E2	D	F4	N1	Q1						●	●									●											●	●		●	●				15
Chlorine, Gas		-101	-34	1.0	-20 / 25	T3O2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●			●							●	●		●	●		●		17
Chlorine, Liquid		-101	-34	1.6	0 / 100	T3O2	D	F4	N1	Q1		●			●	●	●	●	●					●		●	●										●	●		●	●				
Chlorine, Liquid	Dry				-20 / 25	T3O2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●			●						●		●	●		●	●		●		29
Chloro Acetic Acid		62	189	1.6	0 / 120	T2C2	D	F4	N1	Q1			●		●	●	●	●	●					●		●	●										●	●		●	●				5,7
					0 / 188	T2C2	D	F4	N1	Q1					●	●	●	●	●					●		●	●											●			●	●				
Chloro Acetone		-45	119	1.2	0 / 100	T1C1F2	S	F2	N1	Q2			●		●	●	●	●	●					●		●	●										●	●		●	●				
Chloro Acetone	Dry				-20 / 119	T1C1F2	S	F2	N1	Q2			●		●	●	●	●	●		●	●		●		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	29
Chlorobenzene		-45	132	1.1	0 / 100	T1C1F2	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●			●							●	●		●	●				
Chlorobenzene	Dry				-20 / 132	T1C1F2	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●			●		●						●			●	●		●		29
Chloroform (see Trichloromethane)																																												
Chloromethane (see Methyl Chloride)																																												
Chlorosulfonic Acid		-80	158	1.8	-20 / 120	T3C2W2	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●			●								●	●		●	●		●		
					-20 / 158	T3C2W2	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●			●								●			●	●		●		
Chocolate		-	-	1.0	30 / 100		S	F1	N2	Q5	●	●		●			●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●		●	●		●	●	●	●		3,4,7,12,13
Chromic Acid	<20%	0	-	2.7	0 / 50	T3C2W1O2	D	F4	N1	Q1		●			●	●	●	●			●						●			●							●	●		●	●		●		5
Chromic Acid	<90%				0 / 100	T3C2W1O2	D	F4	N1	Q1		●			●	●	●	●									●										●	●		●	●				
Chromic Chloride		0	-	1.0	0 / 20	T3	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●			●								●	●		●	●		●		5,7
					0 / 100	T3	D	F4	N1	Q1					●	●	●	●	●					●		●	●											●	●		●	●				
Chromic Sulphate		0	100	1.7	0 / 100	T2	D	F4	N1	Q1					●	●	●	●	●								●											●	●		●	●				5,7
Citric Acid	<10%	0	-	1.5	0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●	●		●	●		●	●		5,13
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●			●	●		●	●		●	●		
Citric Acid	<95%				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●	●		●								●	●		●	●				
Clavus 32 (see Refrig Oils)																																												
Clay Slurry		0	100	1.0	0 / 100		S	F1	N2	Q5	●		●		●	●	●	●		●	●		●	●	●	●	●		●	●		●	●				●			●	●	●	●		3,4,6,15
Cocoa Butter		33	-	.9	30 / 100		S	F1	N2	Q5	●	●		●			●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●		●	●		●	●	●	●		3,4,7,12,13,16
Coconut Oil (see Vegetable Oils)																																												
Condensate, Water (see Water, Hot)																																												
Cooking Acid, Sulphite (see Red Liquor)																																												
Copper Chloride		0	-	2.5	0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●					●		●	●									●	●		●	●				5
Copper Nitrate	<15%	0	-	3.0	0 / 100	T1O2	S	F2	N1	Q5	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●		●			●	●	●		●	●		●	●		●			5
Copper Nitrate	>15%				0 / 100	T1O2	D	F4	N1	Q1	●	●		●	●	●	●	●	●					●	●	●	●											●	●		●	●				

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																												COMMENTS
Copper Sulphate	<15%	0	-	2.3	0 / 100	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●		●	●			●			●	●	●	●	●	●		5
Copper Sulphate	<60%				0 / 100	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●								●	●		●	●		●		
Copper Sulphate	>60%				0 / 100	T1C1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●	●	●	●											●	●		●	●				
Corn Oil (see Vegetable Oils)																																													
Creosote Oil	-	225	1.1	0 / 60	T3C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	
				0 / 215	T3C1F1	D	F4	N1	Q1					●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	
Cresol (M) Isomer	10	203	1.0	0 / 120	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	
				0 / 200	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●	●	
Cresol (O) Isomer	31	191	1.0	0 / 120	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	7
				0 / 190	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●	●	
Cresol (P) Isomer	36	202	1.0	0 / 120	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	7
				0 / 200	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●	●	
Cresylic Acid	11	235	1.0	0 / 120	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●					●	●	●	●	●	●	●	
				0 / 200	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●					●		●	●	●	●	●	
				0 / 235	T2C1F1	D	F4	N1	Q1						●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●					●		●	●	●	●	●	
Crude Bottoms+H2S (see Crude Oil Residue +H2S)																																												
Crude Oil	-	-	.9	0 / 200	T1F2	S	F3	N1	Q2		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	
				0 / 300	T1F2	D	F4	N1	Q1						●			●		●				●		●		●	●	●		●	●	●	●		●			●	●	●	●	
Crude Oil +H2S	-	-	.9	0 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●		●	●						●			●	●	●	●		4,14,21,30
				0 / 300	T2F2	D	F4	N1	Q1						●			●		●				●		●		●	●			●					●			●	●	●	●		
Crude Oil Residue	93	470	1.0	93 / 200	F1	S	F1	N2	Q5		●			●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●			●	●			●		●	●	●	2,3,4,6,7,11,14
				93 / 400	F1	S	F1	N2	Q5									●		●		●		●		●		●	●			●					●			●	●	●	●		
Crude Oil Residue +H2S	93	470	1.0	93 / 200	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●	●	●	●			●							●			●	●	●	●	1,2,3,4,6,7,14,21,30
				93 / 315	T2F1	D	F4	N1	Q1						●			●		●		●		●		●		●	●			●					●			●	●	●	●		
				93 / 400	T2F1													●		●		●			●		●			●	●			●					●			●	●	●	●		
Crude Oil, Desalted	-	-	.9	0 / 200	T1F2	S	F2	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●		●	●	●	●	●	●	●	4,11,14
				0 / 300	T1F2	S	F2	N1	Q5						●			●		●	●	●		●		●	●	●	●	●			●			●		●	●	●	●	●	●	
Crude Oil, Desalted +H2S	-	-	.9	0 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●		●	●						●			●	●	●	●		4,14,21,30
				0 / 300	T2F2	D	F4	N1	Q1						●			●		●				●		●		●	●			●					●			●	●	●	●		
Crude Oil, Stabilised	-	-	.9	0 / 200	T1F2	S	F2	N1	Q5		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●	●		●			●			●	●	●	●	●	4,11,14
				0 / 300	T1F2	S	F2	N1	Q5						●			●		●				●		●		●	●	●		●		●			●			●	●	●	●		
Crude Oil, Stabilised +H2S	-	-	.9	0 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●		●	●						●			●	●	●	●		4,14,21,30
				0 / 300	T2F2	D	F4	N1	Q1						●			●		●				●		●		●	●			●					●			●	●	●	●		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Crude Oil, Unstabilised	-	-	.9	0 / 200	T1F2	S	F2	N1	Q5		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●	●		●			●			●	●	●	●	●				4,11,14
				0 / 300	T1F2	S	F2	N1	Q5						●			●		●				●		●			●	●	●		●		●			●			●	●	●	●	●				
Crude Oil, Unstabilised+H2S	-	-	.9	0 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●		●	●						●			●	●	●	●					4,14,21,30
				0 / 300	T2F2	D	F4	N1	Q1						●			●		●				●		●			●	●		●	●						●			●	●	●	●				
Cumene (see Isopropyl Benzene)																																																
Cutting Oil (Typical)	-	100	.8	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Cyclohexane	6	81	.8	7 / 81	T1F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Cyclohexanone	-32	157	.9	-32 / 156	T1F1	S	F2	N1	Q2							●	●	●	●	●				●		●			●	●		●	●					●			●	●	●	●				
				-20 / 156	T1F1	S	F2	N1	Q2						●	●	●	●	●	●				●		●			●	●		●	●					●			●	●	●	●				
DEA (see Diethanol Amine)																																																
Decahydronaphthalene	-32	186	.9	-20 / 120	T1C1F1	S	F2	N1	Q2		●			●	●	●	●	●		●			●		●	●		●	●		●	●			●	●	●	●		●	●	●	●	●				
				-20 / 186	T1C1F1	S	F2	N1	Q2		●			●	●	●	●	●		●			●		●	●		●	●		●	●			●	●	●	●		●	●	●	●	●				
Decalin (see Decahydronaphthalene)																																																
Detergent (Typical) <15%	-	100	1.0	0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●			●		●	●	●	●	●	●	●	●					
Detergent (Typical) >15%				0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●				●			●	●	●	●		●					
Deuterium Oxide (see Heavy Water)																																															
Diacetone Alcohol	-51	169	.9	-20 / 120	T1C1F1	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	●				
				-20 / 169	T1C1F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●		●	●	●	●	●	●				
Diallyl Phthalate	-77	190	1.1	-20 / 120	T1C1	S	F2	N1	Q2					●	●	●	●	●		●	●		●	●	●	●		●	●		●	●	●				●	●	●	●	●	●	●				
				-20 / 190	T1C1	S	F2	N1	Q2					●	●	●	●	●			●		●	●	●	●		●			●	●	●				●		●	●	●	●					
Dibromomethane <95%	-53	97	2.5	-20 / 97	T1	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●			●								●	●		●	●		●					
Dibromomethane Dry				-20 / 97	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	●				29
Dibutyl Phthalate	-35	340	1.0	-20 / 100	T1	S	F2	N1	Q2					●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●				
				-20 / 215	T1	D	F4	N1	Q1					●	●	●	●	●					●	●	●	●	●											●			●	●						
				-20 / 250	T1	D	F4	N1	Q1						●	●	●	●					●	●	●	●	●											●			●	●						
Dichloro Benzene (1,2)	-17	176	1.3	-17 / 120	T1	D	F4	N1	Q1		●			●	●	●	●						●		●	●											●	●		●	●						
				-17 / 176	T1	D	F4	N1	Q1		●			●	●	●	●						●		●	●											●			●	●						
Dichloro Benzene (1,2) Dry				-17 / 120	T1	S	F2	N1	Q2		●			●	●	●	●			●			●	●	●	●		●	●	●	●	●					●	●		●	●	●	●	●				29
				-17 / 176	T1	S	F2	N1	Q2		●			●	●	●	●			●			●	●	●	●		●	●	●	●	●					●			●	●	●	●	●				
Dichloro Benzene (1,4)	53	-	1.5	53 / 120	T1	D	F4	N1	Q1		●			●	●	●	●						●		●	●											●	●		●	●							7,11
				53 / 174	T1	D	F4	N1	Q1		●			●	●	●	●						●		●	●											●			●	●						
Dichloro Benzene (1,4) Dry				53 / 120	T1	S	F1	N1	Q5		●			●	●	●	●			●			●	●	●	●		●	●	●	●	●					●	●		●	●	●	●	●				29
				53 / 174	T1	S	F1	N1	Q5		●			●	●	●	●			●			●	●	●	●		●	●	●	●	●					●			●	●	●	●	●				29
Dichloro Ethane (1,1)	-98	57	1.2	-20 / 57	T1F2	S	F2	N1	Q2					●	●	●	●	●		●			●	●	●	●			●								●	●		●	●						

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS				
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																												COMMENTS
Dichloro Ethane (1,1) Dry				-20 / 57	T1F2	S	F2	N1	Q2					●	●	●	●	●		●			●	●	●	●		●	●	●		●			●	●		●	●	●	●	●	29
Dichloro Ethane (1,2)	-36	84	1.3	-20 / 83	T2F2	D	F4	N1	Q1		●			●	●	●	●	●		●			●	●	●	●			●						●	●	●		●	●		●		
Dichloro Ethane (1,2) Dry				-20 / 83	T2F2	D	F4	N1	Q1		●			●	●	●	●	●		●			●	●	●	●		●	●		●			●	●	●	●		●	●		●	●	29
Dichloro Ethylene (1,1)	-123	32	1.2	-20 / 32	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●			●						●	●	●		●	●		●		
Dichloro Ethylene (1,1) Dry				-20 / 32	T2F2	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●	●	●	●	●	●	●			●	●	●		●	●	●	●	●	29
Dichloro Ethylene (1,2)	-81	48	1.3	-20 / 50	T1F2	S	F2	N1	Q2					●	●	●	●			●			●		●	●			●								●	●		●	●		●		
Dichloro Ethylene (1,2) Dry				-20 / 50	T1F2	S	F2	N1	Q2					●	●	●	●			●			●	●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●	29
Dichloro Methane (see Methylene Chloride)																																												
Diesel Fuel	-	280	.9	0 / 100	F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Diethanol Amine	28	269	1.1	0 / 100	T2	D	F4	N1	Q1					●		●	●	●	●	●	●	●		●	●	●			●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	5,7
				0 / 135	T2	D	F4	N1	Q1					●		●	●	●			●		●	●	●	●		●			●	●	●	●			●			●	●	●			
				0 / 170	T2	D	F4	N1	Q1					●		●	●	●			●		●	●	●	●		●			●	●	●	●			●			●	●	●			
				0 / 230	T2	D	F4	N1	Q1							●	●	●					●	●	●	●		●			●						●			●	●	●			
				0 / 250	T2	D	F4	N1	Q1							●	●	●					●	●	●	●		●			●						●			●	●	●			
Diethyl Amine	-50	56	.7	-20 / 100	T2F2	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	●	●	●		●	●		●	●	
Diethyl Ether	-116	35	.7	-20 / 34	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
Diethyl Phthalate	-41	298	1.1	-20 / 120	T2C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●	●	●	
				-20 / 200	T2C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●		●	●	●	●	●	●	
				-20 / 215	T2C1	D	F4	N1	Q1					●	●	●	●	●					●	●	●	●	●	●	●			●						●			●	●	●			
				-20 / 250	T2C1	D	F4	N1	Q1						●	●	●	●					●	●	●	●	●	●	●			●						●			●	●	●			
Diethylene Glycol	-10	245	1.1	-10 / 100	T1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-10 / 130	T1	S	F2	N1	Q2		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-10 / 150	T1	S	F2	N1	Q2		●	●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Digestion Liquor, Acid (see Red Liquor)																																												
Digestion Liquor, Kraft (see White Liquor)																																												
Digestion Liquor, Sulphate (see White Liquor)																																												
Digestion Liquor, Sulphite (see Red Liquor)																																												
Dimethyl Amine	-92	7	.7	-40 / 100	T2C1F1	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●	●	●	●	●	●		
				-20 / 100	T2C1F1	D	F4	N1	Q1					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Dimethyl Formamide	-61	153	1.0	-40 / 40	T2C1F1	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●		●	●		●	●		●	●	●	●		
				-20 / 120	T2C1F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●		●	●		●	●	●	●	●	●		●	●		●	●		●	●	●	●		
				-20 / 153	T2C1F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●		●	●		●	●	●	●	●	●		●	●		●	●		●	●	●	●		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1		
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE	
Dimethyl Phthalate	6	282	1.2	6 / 120	T1C1	S	F2	N1	Q2					●	●	●	●	●		●	●		●	●	●	●	●	●	●		●	●	●					●	●		●	●	●	●		
				6 / 200	T1C1	S	F2	N1	Q2					●	●	●	●	●		●	●		●	●	●	●	●	●	●		●	●	●					●			●	●	●	●		
				6 / 215	T1C1	S	F2	N1	Q2					●	●	●	●	●		●			●	●	●	●	●	●	●		●	●						●			●	●	●	●		
				6 / 250	T1C1	S	F2	N1	Q2						●	●	●	●		●			●	●	●	●	●	●	●		●	●						●			●	●	●	●		
Dimethyl Terephthalate	140	288	1.2	140 / 215	C1	S	F1	N1	Q5					●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●						●			●	●	●	●		5,7,11
				140 / 230	C1	S	F1	N1	Q5						●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●						●			●	●	●	●		
				140 / 250	C1	S	F1	N1	Q5						●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●						●			●	●	●	●		
Dinitro Chlorobenzene	50	315	1.7	50 / 120	T2C1F1	D	F4	N1	Q1					●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●				●	●	●	●	●	●		●	7
				50 / 200	T2C1F1	D	F4	N1	Q1					●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●				●		●	●	●	●		●	
				50 / 215	T2C1F1	D	F4	N1	Q1					●	●	●	●	●					●	●	●	●	●	●											●			●	●					
				50 / 250	T2C1F1	D	F4	N1	Q1						●	●	●	●					●	●	●	●	●	●											●			●	●					
Dioctyl Phthalate	-50	231	1.0	-20 / 120	T1C1	S	F2	N1	Q2					●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●				●	●	●	●	●	●		●	
				-20 / 200	T1C1	S	F2	N1	Q2					●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●				●		●	●	●	●		●	
Diphenyl (see Biphenyl)																																													
Distillate (Heavy)+H2S (see Hydrocarbon C8/C10 +H2S)																																												
Distillate (Light) (see Hydrocarbon C4/C5/C6)																																												
Distillate (Medium) +H2S (see Hydrocarbon C5/C6/C7 +H2S)																																												
DMA (see Dimethyl Amine)																																												
DMT (see Dimethyl Terephthalate)																																												
Dowtherm (see Heat Transfer Oils)																																												
Drilling Cement (see Bentonite)																																												
Electrophoretic Paint	-	-	1.0	0 / 100		S	F1	N2	Q3							●	●	●					●		●	●		●				●						●	●		●	●	●			3,4,6
Elfrima 100 (see Refrig Oils)																																												
Energol LPT100 (see Refrig Oils)																																												
Energol LPT32 (see Refrig Oils)																																												
Energol LPTF32 (see Refrig Oils)																																												
Epichlorohydrin	-25	115	1.2	-20 / 115	T2C2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●		●	●	●			●	●	●						●	●		●	●		●	●		
Ethane, Gas	-183	-89	.4	-40 / 25	F2	D	F4	N1	Q1	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
				-20 / 25	F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Ethane, Liquid	-183	-89	.4	-40 / 100	F2	D	F2	N1	Q6	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 100	F2	D	F2	N1	Q6	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Ethanethiol (see Mercaptan, Ethyl)																																													
Ethanol (see Ethyl Alcohol)																																												
Ethanolamine	11	171	1.0	0 / 170	T2C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●			●	●		●	●	●							●			●	●	●	●			

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Ethyl Acetate	-84	77	.9	-20 / 100	T1C1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	
Ethyl Alcohol	-117	78	.8	-40 / 78	C1F2	S	F2	N1	Q2	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●		●	●	●	
				-20 / 78	C1F2	S	F2	N1	Q2	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●		●	●	●	
Ethyl Benzene	-95	136	.9	-20 / 100	T1C1F2	S	F2	N1	Q2		●			●	●	●	●	●			●	●		●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	●	●	●	
Ethyl Chloride	-141	13	.9	-40 / 25	T1C1F2	D	F4	N1	Q1	●						●	●	●					●	●	●	●	●										●	●		●	●				
				-20 / 25	T1C1F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●					●	●	●	●	●										●	●		●	●				
Ethyl Chloride Dry				-40 / 25	T1C1F2	S	F2	N1	Q2	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	29
				-20 / 25	T1C1F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Ethyl Formate	-79	54	.9	-20 / 100	T1C1F2E2	S	F2	N1	Q5		●					●	●	●		●	●		●	●	●	●		●	●		●	●	●			●	●		●	●	●	●		●		11
Ethyl Phthalate (see Diethyl Phthalate)																																													
Ethylamine	-81	17	.7	-40 / 100	T2C1F2	D	F4	N1	Q1							●	●	●					●	●	●	●		●				●			●		●	●	●	●	●	●			
Ethylene Bromide (see Dibromomethane)																																													
Ethylene Chloride (see Dichloro Ethane (1,2))																																													
Ethylene Dichloride (see Dichloro Ethane (1,2))																																													
Ethylene Glycol	-14	197	1.1	-13 / 100	T1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●		●	●	●	●	●	
				-13 / 120	T1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●		●			●	●	●	●	●	●		●	●	●		●	●	●	●		●	●	●	●	●	
				-13 / 197	T1	D	F4	N1	Q1		●			●	●	●	●	●					●	●	●	●	●										●			●	●				
Ethylene Oxide	-111	11	.9	-40 / 20	T2C1F2	D	F4	N1	Q1							●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	
Ethylene, Gas	-169	-104	1.0	-40 / 25	F2	D	F4	N1	Q1	●									●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
				-20 / 25	F2	D	F4	N1	Q1	●	●		●	●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Ethylene, Liquid	-169	-104	.6	-40 / 100	F2	D	F2	N1	Q6	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 100	F2	D	F2	N1	Q6	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
ETL (see Electrophoretic Paint)																																													
Fatty Acid (see Lauric Acid)																																													
Ferric Sulphate <15%	0	-	2.0	0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●			●	●		●	●		●			●	●			●	●	●		●	●	●	●			5
Ferrous Sulphate	0	100	1.9	0 / 100	T1	S	F1	N1	Q5	●	●	●	●	●	●	●	●	●					●	●	●	●											●	●		●	●				5,7
Fluorine, Gas (refer to John Crane)																																													
Fluorine, Liquid (refer to John Crane)																																													
Formaldehyde	-118	101	1.0	-40 / 100	T2C1F1	D	F4	N1	Q1			●				●	●	●	●			●	●	●	●	●	●		●	●	●			●			●	●	●	●	●	●		●	6
				-20 / 100	T2C1F1	D	F4	N1	Q1			●		●		●	●	●	●			●	●	●	●	●	●		●	●	●			●			●	●	●	●	●	●		●	
Formalin (see Formaldehyde 40%)																																													
Formamide	3	206	1.1	0 / 100	T1C1	S	F2	N1	Q2					●		●	●	●			●	●	●		●	●			●	●			●	●			●	●	●	●	●	●	●		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Formic Acid	8	101	1.2	0 / 20	T2C2	D	F4	N1	Q1			●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●	
				0 / 70	T2C2	D	F4	N1	Q1			●		●	●	●	●	●	●	●		●	●	●	●	●	●		●								●	●		●	●		●		
Fractionator Reflux (Bottom) (see Hydrocarbon C8/C10)																																												
Fractionator Reflux (Bottom)+H2S (see Hydrocarbon C8/C10+H2S)																																												
Fractionator Reflux (Mid)+H2S (see Hydrocarbon C5/C6/C7+H2S)																																												
Fractionator Reflux (Middle) (see Hydrocarbon C5/C6/C7																																												
Fractionator Reflux (Top) (see Hydrocarbon C4/C5/C6)																																												
Fractionator Reflux (Top)+H2S (See Hydrocarbon C4/C5/C6 +H2S)																																												
Freons (see Refrigeration Fluids)																																												
Fruit (Juice & Pulp) (Typical)	-	100	1.0	0 / 100		S	F1	N2	Q5	●	●	●	●			●	●		●	●		●	●		●	●	●	●		●	●			●	●	●	●		●	●		●	●		3,4,6,13
Fuel Oil #1 (see Diesel Fuel)																																												
Fuel Oil #2 (see Diesel Fuel)																																												
Fuel Oil #4 (see Diesel Fuel)																																												
Fuel Oil #5 Heavy (see Fuel Oil, Heavy)																																												
Fuel Oil #5 Light (see Fuel Oil, Heavy)																																												
Fuel Oil #6 (see Fuel Oil, Heavy)																																												
Fuel Oil, Domestic (see Diesel Fuel)																																												
Fuel Oil, Heavy	93	470	1.0	0 / 200	F1	S	F1	N2	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	3,4,6,7,11
Fumaric Acid	0	-	1.6	0 / 100	T1	S	F2	N1	Q5	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●			●	●				●	●		●	●	●	●		13
Fuming Sulphuric Acid (see Oleum)																																												
Furfural <15%	-36	162	1.0	0 / 100	T2C1F1	D	F4	N1	Q1							●	●	●	●	●	●	●	●		●	●	●		●	●		●	●	●		●		●	●	●	●	●	●	●		6
Furfural >15%				-36 / 162	T2C1F1	D	F4	N1	Q1							●	●	●					●		●	●	●										●			●	●				
Fusel Oil (see Amyl Alcohol)																																												
Gargoyle Arctic SHL224 (see Refrig Oils)																																												
Gas Oil, Heavy (see Hydrocarbon C5/C6/C7)																																												
Gas Oil, Light (see Hydrocarbon C3/C4/C5)																																												
Gas Oil, Medium (see Hydrocarbon C4/C5/C6)																																												
Gasoline (see Petrol)																																												
Gelatine	-	-	1.0	0 / 100		S	F1	N2	Q5	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●		●		●	●	●	●		●	●		●	●	●		●	3,4,6,12
Glucose	146	-	1.5	0 / 60		S	F1	N2	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●		●	●	●	●	●	●		●	●	●	●	●		3,5,6
				0 / 100		S	F1	N2	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●		●	●	●	●	●	●		●	●	●	●	●		
Glycerine	18	290	1.3	0 / 100	T1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	
				0 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	
Glycine (see Aminoacetic Acid)																																												

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Glycol (see Ethylene Glycol)																																														
Green Liquor	0	100	1.0	0 / 100	T1C1	S	F1	N2	Q5		●	●		●	●	●	●	●	●	●		●	●	●	●		●	●		●	●				●				●	●	●		●	●		3,5
Gypsum Slurry	0	-	2.3	0 / 100		S	F1	N2	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	●	3,4,6,8,9,10
Gypsum Suspension (FGD) (see Gypsum Slurry)																																														
Heat Trans. Oil, Mobiltherm	-6	400	.9	-6 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				-6 / 400	T1	S	F2	N1	Q2									●		●		●		●		●	●	●	●			●		●	●		●		●	●	●		●	●		
Heat Trans. Oil, Transcal LT	-45	250	.9	-20 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				-20 / 400	T1	S	F2	N1	Q2									●		●		●		●		●	●	●	●			●		●	●		●		●	●	●		●	●		
Heat Transfer Oil (Typical)	-	350	.9	0 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				0 / 400	T1	S	F2	N1	Q2									●	●			●		●		●	●	●				●		●	●		●		●	●	●		●			
Heat Transfer Oil, Dowtherm	12	257	1.1	12 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				12 / 400	T1	S	F2	N1	Q2									●	●			●		●		●	●	●				●		●	●		●		●	●	●		●			
Heat Transfer Oil, Thermex	12	257	1.1	12 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				12 / 400	T1	S	F2	N1	Q2									●		●		●		●		●	●	●	●			●		●	●		●		●	●	●		●	●		
Heat Transfer Oil, Therminol	-6	340	1.5	-6 / 200	T1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	2
				-6 / 400	T1	S	F2	N1	Q2									●		●		●		●		●	●	●	●			●		●	●		●		●	●	●		●	●		
Heavy Distillate +H2S (see Hydrocarbon C8/C10 +H2S)																																														
Heavy Water	4	101	1.1	4 / 101		S	F2	N1	Q1					●	●	●	●	●					●		●	●		●				●					●	●		●	●	●				
Helium, Gas	-272	-269	.2	-40 / 25		D	F4	N1	Q1	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
				-20 / 25		D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Heptane, Liquid	-91	98	.7	-40 / 100	T1F1	S	F2	N1	Q2	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 150	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	
Hexane, Liquid	-95	69	.7	-40 / 100	T1C1F1	S	F2	N1	Q2	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	
				-20 / 100	T1C1F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	
Hexone (see Methyl Isobutyl Ketone)																																														
Hydraulic Oil	-	400	.8	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	●	
Hydrazine	2	114	1.0	2 / 114	T3C2F2	D	F4	N1	Q1			●				●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●				●	●		●	●	●	●			
Hydrobromic Acid <45%	-87	122	1.5	-20 / 100	T2C2	D	F4	N1	Q1		●	●		●	●	●	●	●								●										●	●		●	●					
Hydrobromic Acid <68%				-20 / 100	T2C2	D	F4	N1	Q1		●	●		●	●	●	●	●								●										●	●		●	●					
Hydrocarbon C2/C3/C4	-190	-40	.5	-20 / 200	T1F2	D	F2	N1	Q6		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	14
				-20 / 250	T1F2	D	F2	N1	Q6						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	
Hydrocarbon C3/C4/C5	-140	0	.6	-20 / 200	T1F2	D	F2	N1	Q6		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	14
				-20 / 250	T1F2	D	F2	N1	Q6						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	
Hydrocarbon C3/C4/C5 +H2S	-140	0	.6	-20 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●		●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		14,21,30	
				-20 / 250	T2F2	D	F4	N1	Q1						●	●	●	●		●		●	●	●	●	●		●	●		●	●					●			●	●	●	●			

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Hydrocarbon C4/C5/C6	-130	36	.6	-20 / 200	T1F2	D	F2	N1	Q6		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2,14
					-20 / 250	T1F2	D	F2	N1	Q6						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	
					-20 / 315	T1F2	D	F2	N1	Q6						●			●		●	●	●		●		●	●	●	●		●	●	●	●		●		●	●	●	●	●	●	
					-20 / 400	T1F2	D	F2	N1	Q6									●		●		●		●		●		●	●	●		●		●	●		●		●	●	●	●	●	
Hydrocarbon C4/C5/C6 +H2S	-130	36	.6	-20 / 200	T2F2	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		1,2,14,21,30
					-20 / 250	T2F2	D	F4	N1	Q1						●	●	●	●		●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		
					-20 / 315	T2F2	D	F4	N1	Q1						●			●		●		●		●		●		●	●		●						●			●	●	●	●		
					-20 / 400	T2F2													●		●		●			●		●		●	●		●						●			●	●	●	●		
Hydrocarbon C5/C6/C7	-90	100	.7	-20 / 175	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2,11,14
					175 / 200	T1F1	S	F2	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					175 / 250	T1F1	S	F2	N1	Q5						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	
					175 / 315	T1F1	S	F2	N1	Q5						●			●		●	●	●		●		●	●	●	●		●	●	●	●		●		●	●	●	●	●	●	
					175 / 400	T1F1	S	F2	N1	Q5									●		●		●		●		●		●	●		●						●			●	●	●	●		
Hydrocarbon C5/C6/C7 +H2S	-90	100	.7	-20 / 200	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		1,2,14,21,30
					-20 / 250	T2F1	D	F4	N1	Q1						●	●	●	●		●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		
					-20 / 315	T2F1	D	F4	N1	Q1						●			●		●		●		●		●		●	●		●						●			●	●	●	●		
					-20 / 400	T2F1													●		●		●			●		●		●	●		●						●			●	●	●	●		
Hydrocarbon C8/C10	-40	150	.7	-20 / 175	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2,11,14
					175 / 200	T1F1	S	F2	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					175 / 250	T1F1	S	F2	N1	Q5						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	
					175 / 316	T1F1	S	F2	N1	Q5						●			●		●	●	●		●		●	●	●	●		●	●	●	●		●		●	●	●	●	●	●	
					175 / 400	T1F1	S	F2	N1	Q5									●		●		●		●		●		●	●		●						●			●	●	●	●		
Hydrocarbon C8/C10 +H2S	-40	150	.7	-20 / 200	T2F1	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		1,2,14,21,30
					-20 / 250	T2F1	D	F4	N1	Q1						●	●	●	●		●		●	●	●	●	●		●	●		●	●					●			●	●	●	●		
					-20 / 315	T2F1	D	F4	N1	Q1						●			●		●		●		●		●		●	●		●						●			●	●	●	●		
					-20 / 400	T2F1													●		●		●			●		●		●	●		●						●			●	●	●	●		
Hydrocarbon, Light (see Hydrocarbon C2/C3/C4)																																												
Hydrochloric Acid <40%	-66	110	1.2	-20 / 110	T2C2	D	F4	N1	Q1		●	●				●	●	●					●		●	●												●	●		●	●				
Hydrocyanic Acid <15%	-13	26	.7	-20 / 100	T2C2F2	D	F4	N1	Q1		●	●		●	●	●	●	●					●		●	●				●						●	●	●		●	●				●
Hydrofluoric Acid (refer to John Crane)																																												
Hydrofluosilicic Acid	0	100	1.5	0 / 100	T2C2	D	F4	N1	Q1		●			●	●	●		●					●		●	●												●	●			●				
Hydrogen Chloride, Dry Gas	-114	-85	1.3	-20 / 25	T2C2	D	F4	N1	Q1					●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●					●	●		●	●	●	●	●	17
Hydrogen Fluoride Dry Gas (refer to John Crane)																																												
Hydrogen Peroxide <30%	-2	151	1.5	-20 / 20	T1C2O1	S	F2	N1	Q2		●	●		●	●	●	●	●	●			●	●	●		●	●		●			●	●			●	●	●		●	●		●			

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Hydrogen Peroxide <85%				-20 / 100	T1C2O2	S	F2	N1	Q2					●	●	●	●	●								●									●	●		●	●							
Hydrogen Sulphide	-84	-60	1.2	-20 / 100	T2C1F2	D	F4	N1	Q1			●		●	●	●	●	●		●			●		●	●		●	●			●				●	●		●	●	●	●		17		
Hydrogen Sulphide Dry				-20 / 100	T2C1F2	D	F4	N1	Q1			●		●	●	●	●	●		●			●	●	●	●		●	●			●				●	●		●	●	●	●		29		
Hydrogen Sulphide, Gas (see Hydrogen Sulphide)																																														
Hydrogen, Gas	-259	-253	1.0	-40 / 25	F2E2	D	F4	N1	Q1	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	17		
				-20 / 25	F2E2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Hypochlorous Acid <10%	0	100	1.0	0 / 100	C1O1	S	F2	N1	Q2		●					●	●	●									●										●	●		●	●							
Injection Water (see Water, Injection)																																														
Iso Butane (see Butane, Liquid)																																														
Isobutane, Liquid	-159	-12	.6	-40 / 100	F2	D	F2	N1	Q6	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●				
				-20 / 100	F2	D	F2	N1	Q6	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Isobutyl Alcohol	-108	107	.8	-40 / 107	T1F2	S	F2	N1	Q2			●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●				
				-20 / 107	T1F2	S	F2	N1	Q2		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Isoprene	-146	34	.7	-40 / 34	C1F2	S	F2	N1	Q2	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●					
				-20 / 34	C1F2	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●					
Isopropyl Acetate	-73	89	.9	-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●					
Isopropyl Alcohol	-86	82	.8	-20 / 100	T1F2	S	F2	N1	Q2		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Isopropyl Benzene	-96	153	.9	-20 / 100	T1C1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
				-20 / 150	T1C1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●			●	●	●	●					
Isopropyl Ether	-85	68	.7	-20 / 68	T2C1F2	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Jet Fuel	-	170	.8	0 / 100	F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●				
Kerosene	-	180	.8	0 / 120	T1C1F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●				
				0 / 200	T1C1F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
				0 / 215	T1C1F1	S	F2	N1	Q2					●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
				0 / 250	T1C1F1	S	F2	N1	Q2						●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
				0 / 300	T1C1F1	S	F2	N1	Q2						●			●		●	●	●		●		●	●	●	●	●	●	●		●		●	●		●	●	●	●					
Ketchup	-	-	1.0	0 / 100		S	F2	N1	Q5	●		●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●				●	●		●	●	●	●		4,13		
Kraft Liquor (see White Liquor)																																														
Lacquer	-	-	1.0	0 / 100	F1	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		●	●				●	●		●	●	●	●		4,11		
Lactic Acid <70%	18	122	1.2	0 / 40	T1C1	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●	●		●	●	●	●		●	●	●	●		7,13		
Lactic Acid >70%				0 / 120	T1C1	S	F2	N1	Q2		●			●	●	●	●	●	●			●	●		●	●					●				●	●	●	●		●	●					
Lard	39	-	1.0	39 / 120		S	F1	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●		●	●	●	●		4,7,11		
Latex (refer to John Crane)																																														

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS				
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																												COMMENTS
Lauric Acid	44	225	.8	44 / 120	T1	S	F1	N1	Q5					●	●	●	●	●	●	●	●	●	●		●	●		●	●		●	●	●					●	●		●	●	●	●		5,7,11
				44 / 215	T1	S	F1	N1	Q5					●	●	●	●	●		●	●	●	●		●	●		●	●		●	●	●					●			●	●	●	●		
Light Distillate (see Hydrocarbon C4/C5/C6)																																													
Lime Mud (see Clay Slurry)																																													
Lime Slurry (see Calcium Hydroxide)																																													
Linoleic Acid	-11	230	1.0	-11 / 120	T1	S	F2	N1	Q2					●	●	●	●	●	●	●		●	●		●	●		●	●		●	●						●	●		●	●	●	●		13
				-11 / 215	T1	S	F2	N1	Q2					●	●	●	●	●		●		●	●		●	●		●	●		●	●						●			●	●	●	●		
Linseed Oil (see Vegetable Oils)																																													
Liquified Petroleum Gas (see LPGs)																																													
LNG (see Methane, Liquid)																																													
LPG, Butane (see Butane, Liquid)																																													
LPG, Propane (see Propane, Liquid)																																													
Lubricating Oil	-	340	.9	-20 / 120	F1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Lye, Sulphate (see White Liquor)																																													
Lye, Sulphite (see Red Liquor)																																													
Magnesium Bisulphite Acid (see Red Liquor)																																													
Magnesium Chloride <10%	708	-	2.3	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●						●	●	●	●		●	●		●		●		5
				0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●						●	●	●	●		●	●		●		●		
				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●						●	●	●	●		●	●		●		●		
Magnesium Chloride >10%				0 / 100	C1W1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●						●	●	●	●		●	●		●		●		
Magnesium Hydroxide <10%	0	-	2.4	0 / 30		S	F2	N1	Q1		●	●		●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●			●	●	●	●	●	●	●		5,11
				0 / 60		S	F2	N1	Q1		●	●		●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●			●	●	●	●	●	●	●		
Magnesium Hydroxide >10%				0 / 100		S	F2	N1	Q5		●	●		●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●			●	●	●	●	●	●	●		
Magnesium Sulphate <5%	0	-	2.7	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		5
				0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		
Magnesium Sulphate <40%				0 / 60		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		
				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		
Maleic Acid <15%	0	-	1.6	0 / 100	T1C1F1	S	F2	N1	Q5		●			●	●	●	●	●	●			●	●	●	●	●	●										●	●		●	●				5,11
Maleic Acid >15%				0 / 100	T1C1F1	D	F4	N1	Q1		●			●	●	●	●	●					●	●	●	●											●	●		●	●				
Maleic Anhydride	55	200	.9	0 / 120	T3C1F1W1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●		5,7
				0 / 200	T3C1F1W1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●		
Malic Acid	128	-	1.6	0 / 60	T1C1	S	F2	N1	Q5	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●			●	●		●	●	●			5,13
				0 / 100	T1C1	S	F2	N1	Q5	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●			●	●	●		●			●	●		●				
				0 / 150	T1C1	S	F2	N1	Q5		●			●	●	●	●	●	●		●	●	●	●	●	●	●			●			●	●			●			●	●		●				

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	DIN MATERIAL CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	MAT'L DESCR. CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMP. MAT'L CODE
																																												COMMENTS
Malonic Acid	0	-	1.6	0 / 60	C1	S	F2	N1	Q5		●					●	●	●		●			●	●	●	●			●						●	●		●	●		●		5
				0 / 100	C1	S	F2	N1	Q5		●					●	●	●		●			●	●	●	●			●						●	●		●	●		●		
Manganese Chloride	650	-	3.0	0 / 60	T1	S	F2	N1	Q5	●		●	●	●	●	●	●	●		●			●	●	●	●			●						●	●		●	●		●		5
				0 / 100	T1	S	F2	N1	Q5	●		●	●	●	●	●	●	●		●			●	●	●	●			●						●	●		●	●		●		
MEA (see Ethanolamine)																																												
Medium Distillate +H2S (see Hydrocarbon C5/C6/C7 +H2S)																																											
Melamine	354	-	1.6	0 / 100	T1	S	F2	N1	Q5					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●				●	●		●	●	●	●		
Melamine Resin	-	-	1.0	0 / 100	T2C1F1	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●	●		
Mercaptan, Amyl	-76	124	.8	-20 / 120	T2F2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Butyl	-165	85	.8	-20 / 85	T2F2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Cetyl	18	150	.9	18 / 120	T1C1F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
				18 / 150	T1C1F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercaptan, Decyl	-26	114	.8	-20 / 114		S	F2	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Ethyl	-121	36	.8	-20 / 36	T2F2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Heptyl	-43	177	.8	-20 / 120	F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
				-20 / 177	F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercaptan, Hexyl	-81	153	.8	-20 / 120	T2F1	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
				-20 / 153	T2F1	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercaptan, Lauryl	-8	115	.8	-7 / 115	T2C2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Methyl	-123	8	.9	-20 / 25	T2F2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Nonyl	-20	220	.9	-20 / 120	T1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
				-20 / 215	T1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercaptan, Octyl	-49	199	.8	-20 / 120	F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
				-20 / 199	F1	S	F2	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercaptan, Propyl	-113	67	.8	-20 / 67	T2F2	D	F4	N1	Q1					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		
Mercaptan, Stearyl	29	209	.8	29 / 120	F2	S	F1	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●	●		●	●	●	●		7
				29 / 200	F2	S	F1	N1	Q2					●	●	●	●	●		●	●		●		●	●		●	●			●	●				●			●	●	●	●		
Mercuric Chloride	276	-	5.4	0 / 100	T2F2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●										●	●		●	●				
Mesityl Oxide	-53	131	.9	-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 120	T1F2	S	F2	N1	Q2					●	●	●	●	●							●	●	●	●	●	●				●					●	●		●	●	●			
Methane, Gas	-183	-162	.6	-40 / 25	F2	D	F4	N1	Q1	●						●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	17
				-20 / 25	F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Methane, Liquid (refer to John Crane)																																												
Methanethiol (see Mercaptan, Methyl)																																												

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Methanol (see Methyl Alcohol)																																											
Methyl Acetate	-98	57	.9	-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Methyl Alcohol	-98	65	.8	-20 / 100	T1F2	S	F2	N1	Q2	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
Methyl Benzoate	-12	199	1.1	-12 / 120	T1C1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●	●	●	●	●	●	
				-12 / 200	T1C1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●		●	●	●	●	●	●	
Methyl Bromide	-94	3	1.7	-20 / 25	T2	D	F4	N1	Q1		●			●	●	●	●	●						●	●	●	●										●	●		●	●				
Methyl Bromide Dry				-20 / 25	T2	D	F4	N1	Q1		●			●	●	●	●	●	●	●			●	●	●	●	●		●	●		●	●			●	●	●	●		●	●	●	●	●	29
Methyl Butyrate	-92	102	.9	-20 / 100	F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●		●			●	●	●		●		●	●	●	●	●				
Methyl Chloride Dry	-98	-24	.9	-20 / 25	T1F2	S	F2	N1	Q2					●	●	●	●	●		●			●	●	●	●		●	●			●			●	●	●	●		●	●	●	●	●	29
Methyl Cyanide (see Acetonitrile)																																											
Methyl Ethyl Ketone	-86	80	.8	-20 / 80	T1F2	S	F2	N1	Q2			●		●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	
				-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	
Methyl Formate	-100	32	1.0	-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●			●		●	●	●	●											●	●	●	●	●				
Methyl Glycol (see Propylene Glycol)																																											
Methyl Isobutyl Ketone	-85	116	.8	-40 / 100	T1F2	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	
				-20 / 100	T1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	
Methyl Methacrylate	-48	101	.9	-20 / 100	T1C1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●				●	●		●	●	●	●		
Methyl Propionate	-88	79	.9	-20 / 100	F2	S	F2	N1	Q2	●	●	●	●			●	●	●		●	●		●	●	●	●		●	●		●	●	●				●	●		●	●	●	●		
Methyl Tert Butyl Ether	-110	55	.7	-40 / 100	F1	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●		●		●	●		●	●	●				●	●		●	●	●	●		
				-20 / 100	F1	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●				●	●		●	●	●	●		
Methyl-2-Pyrrolidone (refer to John Crane)																																											
Methylene Chloride	-97	40	1.3	-20 / 40	T2C1	D	F4	N1	Q1					●	●	●	●	●					●	●	●	●											●	●		●	●				
Methylene Chloride Dry				-20 / 40	T2C1	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●	●		●			●	●	●	●		●	●	●	●	●	29
Methylene Glycol (see Propylene Glycol)																																											
Milk	-	100	1.0	0 / 100		S	F2	N1	Q1	●	●	●				●	●	●	●	●		●	●		●	●	●		●	●		●	●		●		●	●		●	●	●	●		13
Mineral Oil	-	340	.8	-20 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	28
				-20 / 200		S	F2	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	
Molasses (see Sugar, Molasses)																																											
Monoethanol Amine (see Ethanolamine)																																											
Motor Spirit (see Petrol)																																											
MTBE (see Methyl Tert Butyl Ether)																																											
N-Methyl-2-Pyrrolidone (refer to John Crane)																																											
Naphtha, Coal Tar	-	160	.9	0 / 120	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	
				0 / 200	T1F1	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●			●	●	●	●	●	

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Naphtha, Petroleum	-73	60	.6	-20 / 215	F2	D	F4	N1	Q1					●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●				●			●	●	●	●	●			
				-20 / 260	F2	D	F4	N1	Q1						●	●	●	●		●	●	●		●	●	●	●		●	●	●	●	●	●				●			●	●	●	●	●			
Naphtha, Printers	-60	120	.7	-20 / 120	F2	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●			
Naphthalene	81	218	1.0	81 / 120	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●	●			●	●	●	●		●		●	6,7		
				81 / 200	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●		●			●		●	●	●		●		●			
Natural Gas (see Methane, Gas)																																															
NGL (see Hydrocarbon C2/C3/C4)																																															
Nickel Chloride	0	100	1.0	0 / 100	T3C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●		●			●		●	●			●	●						●	●		●	●		●	●	5,7		
Nickel Sulphate	0	-	2.1	0 / 100	T3C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	5		
Nitric Acid <20%	-42	122	1.4	-20 / 70	T2C2	D	F4	N1	Q1					●	●	●	●				●		●		●	●		●			●	●	●				●	●		●	●	●					
Nitric Acid <50%				-20 / 50	T2C2	D	F4	N1	Q1							●	●				●						●		●			●	●	●				●	●		●	●	●					
Nitric Acid <70%				-20 / 20	T2C2	D	F4	N1	Q1		●					●	●	●		●	●						●		●	●	●		●	●				●	●		●	●	●	●	●			
Nitric Acid >70%				-40 / 120	T2C2O2	D	F4	N1	Q1							●	●										●											●	●		●	●						
Nitrobenzene	6	211	1.2	6 / 120	T3C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●	●	●				
				6 / 210	T3C1	D	F4	N1	Q1					●	●	●	●	●		●	●			●	●	●	●	●		●		●	●	●				●			●	●	●	●				
Nitrogen	-	-196	1.0	-40 / 25		D	F4	N1	Q1	●		●				●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	17		
				-20 / 25		D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●			
Nitrohydrochloric Acid	-	100	1.0	0 / 100	T2C2O2	D	F4	N1	Q1					●	●	●	●	●								●												●	●		●	●						
Nitromethane	29	101	1.1	0 / 100	T1F1E2	S	F1	N1	Q5					●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●				●	●	●	●	●	●	●		7,11		
Nonyl Phenol	-10	296	.9	-10 / 100		S	F2	N1	Q1	●	●	●	●			●	●	●	●		●	●		●	●	●	●	●	●			●	●	●	●	●		●	●		●	●	●					
				-10 / 200		S	F2	N1	Q1		●					●	●	●	●		●	●		●	●	●	●	●	●			●	●	●	●	●		●			●	●	●					
Octyl Phenol	77	-	.9	0 / 100		S	F2	N1	Q1	●	●	●	●			●	●	●	●		●	●		●	●	●	●		●			●	●	●				●	●		●	●	●					
Oil of Mirbane (see Nitrobenzene)																																															
Oleic Acid	4	200	.9	4 / 120	T1C1	S	F2	N1	Q2					●	●	●	●	●	●			●		●	●	●	●	●	●			●	●			●		●	●	●	●	●	●					
				4 / 150	T1C1	S	F2	N1	Q2					●	●	●	●	●	●			●		●	●	●	●	●	●			●	●			●		●		●	●	●	●					
Oleum	-	180	1.9	0 / 90	C2W2	S	F2	N1	Q2		●			●	●	●	●										●												●		●	●	●					
				0 / 180	C2W2	D	F4	N1	Q1		●			●	●	●	●										●												●			●	●						
Olive Oil (see Vegetable Oils)																																															
Oxalic Acid <10%	0	-	1.9	0 / 100	T2	D	F4	N1	Q1		●	●		●	●	●	●	●						●		●	●	●										●	●		●	●						
Oxygen, Gas	-218	-183	1.4	-40 / 25		D	F4	N1	Q1			●				●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	17		
				-20 / 25		D	F4	N1	Q1		●	●				●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●			
Ozone <12%	-192	-112	1.6	-40 / 90	T2C1F1O2	D	F4	N1	Q1							●	●	●	●	●		●					●			●	●						●			●	●	●	●				
Paint, Oil Based	-	-	1.0	0 / 100	T1F2	D	F2	N1	Q6	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	4		

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Paint, Water Based	0	100	1.0	0 / 100		S	F1	N2	Q5					●	●	●	●	●	●	●	●	●	●		●	●		●	●		●	●	●				●	●		●	●		●	●				3,4,5,6
Palm Oil (see Vegetable Oils)																																															
Palmitic Acid	63	352	.8	63 / 100		S	F1	N1	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●		●	●		●	●		●	●				4,7,11
				63 / 200		S	F1	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●		●		●	●		●	●		●	●				
Paper Coating Solution	-	100	1.0	0 / 100	F1	S	F2	N1	Q5			●		●	●	●	●	●	●	●		●				●		●	●		●	●					●			●	●		●	●				4,11,15
Paper Sizing Solution	-	100	1.0	0 / 100		S	F2	N1	Q5			●		●	●	●	●	●	●	●		●				●		●	●		●	●					●			●	●		●	●				4,12,15
Paper Stock <3%	-	100	1.0	0 / 60		S	F1	N2	Q1		●	●		●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●		●		●	●		●	●		●	●				3,5,6,15
Paper Stock <6%				0 / 100		S	F1	N2	Q5		●	●		●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●		●		●	●		●	●		●	●				
Paraffin Wax	50	-	.9	50 / 100		S	F1	N2	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●				●	●	●	●	●	●	●				4,6,7,11
				50 / 200		S	F1	N2	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●				●		●	●	●	●	●				
Paraffin, Liquid	-	-	.9	0 / 100	T1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●				●	●		●	●	●	●				
				0 / 120	T1	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●				●	●		●	●	●	●				
Peanut Oil (see Vegetable Oils)																																															
Pectin Liquor	-	-	1.0	0 / 100		S	F2	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●		●	●		●	●				13
Pentane, Liquid	-130	36	.6	-40 / 100	T1F2	D	F4	N1	Q1	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
				-20 / 100	T1F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Perchloric Acid <70%	-112	19	1.8	-20 / 100	T1C2O2E2	D	F4	N1	Q1		●					●	●	●									●											●	●		●	●							
Perchloroethylene	-22	121	1.6	-20 / 120	T1C1	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●	●			●	●							●	●		●	●			●	●			
Petrol	-	40	.8	0 / 69	F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Petroleum Ether (see Naphtha, Petroleum)																																															
Phenol (see Carbolic Acid)																																															
Phenylacetic Acid	77	266	1.1	77 / 120	T1C1	S	F1	N1	Q5			●		●	●	●	●	●		●			●	●	●	●	●			●	●					●	●	●	●		●	●			●	●				7
				77 / 200	T1C1	S	F1	N1	Q5					●	●	●	●	●		●			●	●	●	●	●			●	●					●	●	●	●		●	●			●	●			
Phosgene	-118	8	1.4	-20 / 25	T2	D	F4	N1	Q1					●	●	●	●	●					●		●	●	●			●					●			●	●		●	●				●			
Phosphoric Acid, Pure (%H3PO4) <60%	42	158	1.9	0 / 60	T1C1	S	F2	N1	Q5		●	●		●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●	●		●	●		●	●				5,7,26
				0 / 80	T1C1	S	F2	N1	Q5		●	●		●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●	●		●	●		●	●				
Phosphoric Acid, Pure (%H3PO4) >60%				0 / 40	T1C1	S	F2	N1	Q5		●			●	●	●	●		●	●		●	●		●	●		●	●		●	●					●	●		●	●		●	●				
				0 / 100	T1C1	D	F4	N1	Q1		●			●	●	●	●						●		●	●											●	●		●	●							
Phosphoric Acid, Slurry (%H3PO4) <35%	42	100	1.8	0 / 80	T1C1	S	F1	N2	Q5		●			●	●	●	●			●							●		●		●							●	●		●	●		●					3,5,8,9,10,24
Phosphoric Acid, Super (72% P2O5)	-	158	1.0	160 / 200	T1C1	D	F4	N1	Q1					●	●	●	●										●											●			●	●							
Phosphoric Acid,Contaminated (%H3PO4) <35%	42	100	1.9	0 / 80	T1C1	S	F2	N1	Q5		●			●	●	●	●			●							●		●		●							●	●		●	●		●					5,25
Phthalate Ester	-	-	1.0	0 / 100	T1C1	S	F2	N1	Q2							●	●	●	●	●			●	●	●	●	●		●	●		●	●					●	●		●	●	●	●				
Phthalic Acid	201	-	1.6	0 / 100	T1C1	S	F2	N1	Q5		●			●	●	●	●	●	●				●	●	●	●	●		●			●	●					●	●		●	●		●					
Phthalic Anhydride	131	285	1.5	132 / 200	T3C1	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●		●	●	●	●	●	●				7

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
											B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
											130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Picric Acid	<15%	0	-	1.8	0 / 100	T2C1E2	D	F4	N1	Q1		●			●	●	●	●				●		●		●	●		●				●					●	●		●	●	●			
Pine Oil (see Vegetable Oils)																																													
Pine Soap (Paper Industry)		-	-	1.0	0 / 100		S	F1	N1	Q3		●			●	●	●	●	●	●	●	●	●				●	●	●	●	●	●					●	●		●	●	●	●		4,7,15
Pitch		-	-	1.0	150 / 200		S	F1	N2	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●			●			●	●	●	●	●	2,3,4,6,7,11
					150 / 340		S	F1	N2	Q5									●		●	●	●		●	●	●	●	●	●	●		●	●		●			●			●	●	●	●	
Polyalkylene Glycol Lub. (see Refrig Oils)																																													
Polyol Ester Lubricant (see Refrig Oils)																																													
Polypropylene Slurry		-	-	.9	0 / 100	F2	S	F1	N2	Q5	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●		●	●	●	●	●	4,6,11
Polyvinyl Acetate, Slurry		-	-	1.2	0 / 100		S	F3	N1	Q1				●		●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●					●	●		●	●	●		3
Polyvinyl Alcohol	<5%	-	-	1.3	0 / 60		S	F2	N1	Q1				●				●	●	●	●	●		●	●	●	●	●	●	●		●	●					●	●		●	●	●		5,7
Polyvinyl Alcohol	>5%				0 / 100		S	F2	N1	Q5				●				●	●	●	●	●		●	●	●	●	●	●	●		●	●					●	●		●	●	●		
Polyvinyl Chloride		-	-	1.4	0 / 100		S	F3	N1	Q1		●			●	●	●	●	●	●	●	●	●	●		●	●		●	●		●	●	●				●	●	●	●	●	●	●		3
					0 / 148		S	F3	N1	Q1		●			●	●	●	●	●					●		●	●		●				●					●		●	●	●	●			
					0 / 250	T2	D	F4	N1	Q1						●	●	●	●					●		●	●		●				●					●		●	●	●	●			
Pond Water (see Water, Dirty)																																													
Potassium Bromide	<80%	734	-	2.7	0 / 60	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●			●							●	●	●		●	●		●		5
					0 / 70	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●		●	●			●							●	●	●		●	●		●		
Potassium Carbonate	<20%	0	-	2.5	0 / 60	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●			●	●		●	●		●			●	●			●	●	●		●	●				5
Potassium Carbonate	>20%				0 / 100	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●			●	●		●	●		●			●	●			●	●	●		●	●		●		
Potassium Chlorate	<25%	0	-	2.3	0 / 20	T1C1E2	S	F2	N1	Q5	●	●		●	●	●	●	●	●		●	●		●		●	●			●							●	●	●		●	●				
Potassium Chlorate	>25%				0 / 100	T1C1E2	D	F4	N1	Q1	●	●		●	●	●	●	●	●					●		●	●											●	●		●	●				
Potassium Chloride	<5%	772	-	2.0	0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	5
Potassium Chloride	>5%				0 / 60		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	
Potassium Cyanide		0	-	1.5	0 / 100	T2C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●											●	●		●	●				5
Potassium Dichromate	<5%	0	-	2.7	0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●		●	●				●		●		●	●	●		●	●		●	●		●	●				5
Potassium Dichromate	<55%				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●		●	●				●		●		●	●	●		●	●		●	●		●	●				
Potassium Hydroxide	<10%	-	-	2.0	0 / 30		S	F2	N1	Q1			●		●	●	●	●	●		●			●	●	●	●	●	●	●	●		●				●	●			●	●	●	●	5
					0 / 60		S	F2	N1	Q1			●		●	●	●	●	●		●			●	●	●	●	●	●	●	●		●				●	●			●	●	●	●	
					0 / 100		S	F2	N1	Q5			●		●	●	●	●	●					●	●	●	●	●			●						●	●	●			●			●	
Potassium Hydroxide	<55%				0 / 100		S	F2	N1	Q5			●		●	●	●	●	●								●	●			●						●	●	●			●			●	
Potassium Hydroxide	>55%				0 / 100		D	F4	N1	Q1							●	●	●								●	●										●	●			●				
Potassium Nitrate		0	-	2.1	0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●					●	●	●	●	●				●						●	●		●	●	●			5
Potassium Permanganate	<10%	0	-	2.7	0 / 20	T1O2	S	F2	N1	Q5	●			●	●	●	●	●	●	●	●	●	●	●	●		●	●			●	●	●	●	●			●	●		●	●	●			7

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Potassium Permanganate >10%				0 / 100	T1O2	D	F4	N1	Q1	●			●	●	●	●	●	●					●		●	●										●	●		●	●				
Potassium Phosphate	0	100	1.0	0 / 100		D	F4	N1	Q1	●		●	●	●	●	●	●	●					●	●	●	●										●	●		●	●				7
Potassium Sulphate <25%	0	-	2.7	0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●			●	●	●	●		●	●			●	●		●		●		
Propane, Gas	-190	-43	.5	-40 / 25	T1F2	D	F4	N1	Q1	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	17
				-20 / 25	T1F2	D	F4	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Propane, Liquid	-190	-43	.5	-40 / 100	T1F2	D	F2	N1	Q6	●						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 100	T1F2	D	F2	N1	Q6	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Propanol (see Propyl Alcohol)																																											
Propionic Acid	-22	141	1.0	-20 / 100	T1C2F1	S	F2	N1	Q2			●		●	●	●	●	●		●			●	●	●	●			●								●	●		●	●		●		
Propyl Alcohol	-127	97	.8	-40 / 100	T1F2	S	F2	N1	Q2	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	
				-20 / 100	T1F2	S	F2	N1	Q2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	
Propylene Glycol	-60	187	1.0	-40 / 100		S	F2	N1	Q1	●		●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●			●	●		●	●	●	●		
				-20 / 120		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●			●	●		●	●	●	●		
				-20 / 187		S	F2	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●			●			●	●	●	●		
Propylene Oxide	-104	34	1.5	-40 / 100	C1F2	S	F2	N1	Q2							●	●	●	●		●	●	●		●	●		●			●	●	●		●		●	●		●	●	●		
Propylene, Liquid	-185	-48	.5	-40 / 50	F2	D	F2	N1	Q6							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				-20 / 50	F2	D	F2	N1	Q6		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Pulp, Wood (see Paper Stock)																																											
PVA (see Polyvinyl Alcohol)																																											
PVAc (see Polyvinyl Acetate)																																											
Pyridine	-42	116	1.0	-40 / 100	T2C1F2	D	F4	N1	Q1							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●		
				-20 / 100	T2C1F2	D	F4	N1	Q1					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●		
Quenching Oil	-	260	1.0	0 / 200		S	F2	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●			●	●	●	●		4,11
Rapeseed Oil (see Vegetable Oils)																																											
Raw Oil (see Crude Oil +H2S)																																											
Red Liquor	-	100	1.0	0 / 120	T1C1	S	F1	N2	Q5		●	●		●	●	●	●		●	●		●	●		●	●		●	●		●	●					●	●		●	●	●	●		3,4,5,6,15,22
Reflux (Bottom)+H2S (see Hydrocarbon C8/C10 +H2S)																																											
Reflux (Middle) +H2S (see Hydrocarbon C5/C6/C7 +H2S)																																											
Reflux (Top) (see Hydrocarbon C4/C5/C6)																																											
Refrig Fluid, Freon 11	-111	24	1.5	-20 / 25	T1	S	F2	N1	Q2		●					●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●	●		18,28
Refrig Fluid, Freon 113	-35	48	1.6	-35 / 48	T1C1	S	F2	N1	Q2	●						●	●	●	●		●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●			18,28
Refrig Fluid, Freon 114	-94	4	1.5	-40 / 25	T1	S	F2	N1	Q2	●		●				●	●	●	●		●	●	●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●			18,28
				-20 / 25	T1	S	F2	N1	Q2	●	●	●	●			●	●	●	●		●	●	●	●	●	●	●	●		●	●	●		●		●	●	●	●	●	●			
Refrig Fluid, Freon 12	-158	-30	1.3	-40 / 20	T1	S	F2	N1	Q2	●						●	●	●	●		●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●		18,28

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Refrig Fluid, Freon 134A	-108	-26	1.2	-20 / 20	T1C1						●								●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	1,18,28	
Refrig Fluid, Freon 22	-160	-41	1.2	-40 / 20	T1	S	F2	N1	Q2			●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	18,28	
				-20 / 20	T1	S	F2	N1	Q2			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Refrig Fluid, Freon 502	-	-46	1.2	-40 / 20	T1	S	F2	N1	Q2			●				●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	18,28	
Refrig Oil, Arctic C Heavy	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil, Arctic C Light	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil, BP Energol LPT32	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil, Elf Elfrima 100	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil, ESSO Zerice	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil, Polyol Ester	-	300	.8	0 / 80															●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			1,19,28	
Refrig Oil, SHELL Clavus 32	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil,BP Energol LPT100	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil,BP Energol LPTF32	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil,Gargoyle SHL224	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil,Polyalkylene Glyc.	-	300	.8	0 / 80															●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			1,19,28	
Refrig Oil,SUNOCO Suniso 4GS	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Refrig Oil,SUNOCO Suniso 5GS	-	300	.8	0 / 80		S	F2	N1	Q1	●			●						●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			19,28	
Residue, Atmospheric (see Crude Oil Residue)																																														
Residue, Cracked (see Crude Oil Residue)																																														
Residue, Vacuum (see Crude Oil Residue)																																														
Residue, Visbreaker (see Crude Oil Residue)																																														
Resin, Natural	-	-	1.5	0 / 100		S	F2	N1	Q3							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	4,7,11	
				0 / 200		S	F2	N1	Q5							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Sea Water (see Water, Sea)																																														
Sewage, Raw	-	100	1.0	0 / 60		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●					●	●		●	●	●			5,6	
				0 / 100		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●					●	●		●	●	●				
Sewage, Sludge	-	100	1.0	0 / 100		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●					●	●		●	●	●			3,5,6	
Sewage, Treated	-	100	1.0	0 / 60		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●					●	●		●	●	●			5,6	
				0 / 100		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●					●	●		●	●	●				
Silicon Tetrachloride	-70	58	1.5	-40 / 57	T1C1W2	D	F4	N1	Q1							●	●	●					●		●	●												●	●		●	●						
				0 / 57	T1C1W2	S	F2	N1	Q2							●	●	●					●		●	●												●	●		●	●						
Silicon Tetrachloride Dry				-40 / 20	T1C1W2	S	F2	N1	Q2							●	●	●		●	●		●	●	●	●		●	●	●	●	●	●	●					●	●	●	●	●	●	●	●	29	
				-40 / 57	T1C1W2	S	F2	N1	Q2							●	●	●		●			●	●	●	●		●	●	●	●	●								●	●	●	●	●	●	●	●	29	

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Silicone Fluid		-50	250	1.0	-40 / 250		S	F2	N1	Q1							●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	
					-20 / 120		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					-20 / 200		S	F2	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
					-20 / 215		S	F2	N1	Q1					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
					-20 / 250		S	F2	N1	Q1						●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
Silver Nitrate	<70%	0	-	4.3	0 / 20	T1C2O2	D	F4	N1	Q1		●	●		●	●	●	●	●	●	●		●	●		●	●		●		●	●					●	●		●	●	●	●		5
Silver Nitrate	>70%				0 / 100	T1C2O2	D	F4	N1	Q1		●	●		●	●	●	●	●	●			●	●		●	●				●							●	●		●	●				
Soap Liquor		-	-	1.0	0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●		●	●	●	●	●	
Soda Ash (see Sodium Carbonate)																																												
Sodium Acetate	<10%	0	-	1.5	0 / 60		S	F2	N1	Q1			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	5,7
Sodium Acetate	>10%				0 / 60		S	F1	N1	Q5			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
					0 / 100		S	F1	N1	Q5			●		●	●	●	●	●		●			●	●	●	●	●	●	●	●					●	●	●		●	●	●	●	●	●	
Sodium Bicarbonate		0	-	2.2	0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●					●	●		●	●		●		13
Sodium Bisulphate	<10%	0	-	2.1	0 / 30	C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●				●	●		●			●	●		●	●			5,7
					0 / 60	C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●				●		●					●	●		●	●				
Sodium Bisulphate	>10%				0 / 100	C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●											●	●		●	●				
Sodium Bisulphite	<50%	0	-	1.5	0 / 20	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●					●		●	●		●				●					●	●		●	●	●			5,7,13
Sodium Bisulphite	>50%				0 / 100	T1C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●											●	●		●	●				
Sodium Borohydride		0	-	1.1	0 / 100	F2W1	D	F4	N1	Q1		●	●											●		●	●	●										●	●		●	●				5,15
Sodium Carbonate		851	-	2.5	0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	13
Sodium Chlorate	<90%	0	-	2.5	0 / 30	F2O2	S	F2	N1	Q2					●	●	●	●	●	●	●		●	●	●	●	●			●	●	●					●	●		●	●		●	●	5,11
					0 / 60	F2O2	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●	●	●	●			●	●	●					●	●		●	●		●	●	
					0 / 100	F2O2	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●	●	●	●			●	●	●					●	●		●	●		●	●	
Sodium Chloride	<5%	801	-	2.2	0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●					●	●		●	●		●	●	5
Sodium Chloride	<30%				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●						●			●	●					●	●		●	●		●	●	
Sodium Cyanide		564	-	1.0	0 / 40	T2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●			●	●	●	●	●	●	●	●		●	●	●	●		
					0 / 100	T2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●	●			●	●		●	●									●	●	●		●	●				
Sodium Dichromate	<20%	0	-	2.5	0 / 100	T1C1	S	F2	N1	Q5		●	●		●	●	●	●	●	●		●	●				●		●			●	●	●		●		●	●		●	●			5
Sodium Dithionite (see Sodium Hydrosulphite)																																												
Sodium Hydrosulphide	<50%	53	-	1.0	0 / 60	C1	S	F2	N1	Q5					●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●					●	●		●	●	●	●	5,7
					0 / 100	C1	S	F2	N1	Q5					●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●					●	●		●	●	●	●	
Sodium Hydrosulphide	>50%				0 / 100	C1	D	F4	N1	Q1					●	●	●	●	●					●		●	●											●	●		●	●				
Sodium Hydrosulphite		55	100	1.5	0 / 100	F1W1	D	F4	N1	Q1			●		●	●	●	●	●					●		●	●											●	●		●	●				5,7

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID		MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
											P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
											B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
											130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Sodium Hydroxide	<15%	318	-	2.1	0 / 60	T1C1	S	F2	N1	Q5			●		●	●	●		●	●	●		●	●		●	●	●	●	●	●		●		●	●	●	●	●		●	●	●	●				5
Sodium Hydroxide	<50%				0 / 80	T1C1	S	F2	N1	Q5			●		●	●	●		●	●	●		●				●	●	●	●	●		●			●		●	●	●		●	●	●	●				
Sodium Hydroxide	<60%				0 / 90	T1C1	S	F2	N1	Q5			●		●	●	●		●	●	●		●				●	●	●	●	●		●			●		●	●			●	●	●	●				
Sodium Hydroxide	<70%				0 / 100	T1C1	S	F2	N1	Q5			●		●	●	●		●								●	●				●				●		●	●			●			●				
Sodium Hypochlorite	<10%	0	-	1.2	0 / 20	T1C2O2	D	F4	N1	Q1		●			●	●	●	●	●		●						●			●							●		●	●			●	●					5,7
Sodium Hypochlorite	>10%				0 / 100	T1C2O2	D	F4	N1	Q1		●			●	●	●	●									●										●		●	●									
Sodium Nitrate	<90%	0	-	2.3	0 / 60	T1O2E2	S	F2	N1	Q5			●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●			●	●	●		●	●	●	●		●						5,13
					0 / 100	T1O2E2	S	F2	N1	Q5			●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●			●	●	●		●	●	●	●		●						
Sodium Nitrite	<70%	0	-	2.2	0 / 100	T2O2E2	D	F4	N1	Q1			●				●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●			●	●		●	●	●	●					5
Sodium Phosphate Dibasic	<20%	0	-	2.1	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					5
					0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●				
Sodium Phosphate Dibasic	<70%				0 / 60		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●				
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●				
Sodium Phosphate Monobasic		0	-	2.0	0 / 60	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●		●		●	●		●	●						5
					0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●		●		●	●		●	●						
Sodium Phosphate Tribasic		0	-	1.6	0 / 60	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●	●	●				5,7
					0 / 100	T1	S	F1	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●		●	●						
Sodium Silicate		-	-	2.6	0 / 100		S	F3	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					3,5
Sodium Sulphate	<5%	0	-	2.7	0 / 30		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					5
					0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
Sodium Sulphate	>5%				0 / 60		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
					0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●		●	●	●	●					
Sodium Sulphide	<20%	0	-	1.9	0 / 40	T1C2F2E2S2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●		●			●		●	●		●	●			●			●		●	●		●	●	●	●				5,7
Sodium Sulphide	>20%				0 / 100	T1C2F2E2S2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●		●	●											●	●		●	●						
Sodium Sulphite	<50%	0	-	2.6	0 / 60	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●			●		●	●		●	●	●	●				5
					0 / 100	T1C1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●		●	●			●		●	●		●	●	●	●				
Sodium Thiocyanate	<90%	0	-	1.0	0 / 60	T1	S	F2	N1	Q5	●	●		●	●	●	●	●	●	●		●	●	●		●	●	●	●	●		●	●	●		●		●	●		●	●		●				5
					0 / 100	T1	S	F2	N1	Q5	●	●		●	●	●	●	●	●	●		●	●	●		●	●	●	●	●		●	●	●		●		●	●		●	●		●				
					0 / 130	T1	D	F4	N1	Q1		●		●	●	●	●	●	●					●		●	●	●										●		●	●							
Sodium Thiosulphate	<15%	0	-	1.7	0 / 30		S	F2	N1	Q1		●	●		●	●	●	●	●	●			●	●	●	●	●		●		●	●	●				●			●	●	●	●					5,7
					0 / 60		S	F2	N1	Q1		●	●		●	●	●	●	●	●			●	●	●	●	●	●		●		●	●					●			●	●	●	●					
Sodium Thiosulphate	>15%				0 / 60	C1	S	F1	N1	Q5		●	●		●	●	●	●	●	●			●	●	●	●	●	●		●		●	●					●			●	●	●	●					
					0 / 100	C1	S	F1	N1	Q5		●	●		●	●	●	●	●	●			●	●	●	●	●	●		●		●	●					●			●	●	●	●					

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Seal Material and Arrangement Guide

Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Sour Water (see Water, Sour)																																											
Soya Bean Oil (see Vegetable Oils)																																											
Spent Sulphite Liquor (see Sulphite Waste Liquor)																																											
Splitter Bottoms +H2S (see Hydrocarbon C8/C10 +H2S)																																											
Sponge Oil (see Hydrocarbon C4/C5/C6)																																											
Starch	<5%	-	-	1.0	0 / 60		S	F3	N1	Q1	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●		●	●		3,5,13
Starch	>5%				0 / 100		S	F3	N1	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●		●	●		
Steam		-	-	-	0 / 100						●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	1,17
					0 / 120							●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	
					0 / 200										●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●		●	●	●	●	●	●	●	
Stearic Acid		70	361	.8	70 / 100		S	F1	N2	Q3		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●		●	●		●	●	●	●	4,6,7,11
					70 / 200		S	F1	N2	Q5		●			●	●	●	●	●	●			●	●	●	●	●	●	●			●	●			●	●			●		●	●		●			
Stoddard Solvent		-	260	1.0	0 / 100	T1F1	S	F2	N1	Q2	●			●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	11
					0 / 215	T1F1	S	F2	N1	Q5					●	●	●		●		●	●	●	●	●	●	●	●	●	●		●		●	●	●	●		●		●	●	●	●	●	●	●	
					0 / 250	T1F1	S	F2	N1	Q5						●	●		●		●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●		●	●	●	●	●	●	●	
Styrene (see Vinylbenzene)																																											
Sugar, Carbonated Juice		-	100	1.0	60 / 100		S	F3	N1	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●		●	●		3,5,13
Sugar, Clear Juice	<50%	-	100	1.0	0 / 70		S	F3	N1	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●		●	●		3,5,13
Sugar, Dense Liquor		-	100	1.0	0 / 20		S	F1	N2	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●	●		●	●	●	3,4,6,8,9,10,13
Sugar, Diffuser Juice		-	100	1.0	60 / 100		S	F3	N1	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●		●	●		3,5,13
Sugar, Limed Juice		-	100	1.0	60 / 100		S	F3	N1	Q5	●	●	●	●			●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●		●	●		3,5,13
Sugar, Molasses		-	-	1.0	50 / 100		S	F3	N1	Q5	●	●		●			●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●			●	●		●	●		●	●		3,5,7,13,16
Sugar, Molten		-	-	1.6	50 / 100		S	F1	N1	Q5	●	●	●	●			●	●	●		●	●		●		●	●	●	●	●	●						●	●		●	●		●	●		5,7,13,16
Sugar, Syrup		-	-	1.3	60 / 100		S	F2	N1	Q5	●	●	●	●			●	●		●	●	●	●	●		●	●	●	●	●	●		●	●		●	●	●	●		●	●		●	●		5,13
Sulphamic Acid		-	100	2.1	0 / 100	C1	S	F1	N1	Q5					●	●	●	●	●					●		●	●		●				●					●	●		●	●		●			5,7
Sulphate Liquor (see White Liquor)																																											
Sulphite Liquor (see Red Liquor)																																											
Sulphite Waste Liquor		-	100	1.0	0 / 120		S	F1	N2	Q5		●			●	●	●	●	●	●	●		●	●		●	●		●	●		●	●					●	●			●		●	●		3,5,6,15
Sulphonated Oil		-	-	3.0	0 / 100	F2	S	F2	N1	Q2					●	●	●	●	●		●			●	●	●	●			●								●	●		●	●			●		
Sulphur		116	445	2.1	140 / 200	F1	S	F1	N1	Q2		●			●	●	●	●	●		●			●		●	●		●	●		●	●				●	●			●	●		●	●		7
Sulphur Chloride		-80	138	1.7	-20 / 138	T3C2W2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●		●	●			●					●			●	●		●	●		
Sulphur Dioxide, Dry		-76	-10	1.4	-20 / 100	T2C1O2	D	F4	N1	Q1		●	●		●	●	●	●	●	●			●	●	●	●	●		●			●	●			●		●	●		●	●		●			13
Sulphuric Acid	<25%	10	327	1.8	0 / 20	C2W2	S	F2	N1	Q2		●			●	●	●	●	●	●	●			●		●	●		●	●		●	●			●		●	●		●	●		●	●		
Sulphuric Acid	<55%				0 / 20	C2W2	S	F2	N1	Q2		●			●	●	●	●	●	●	●			●		●	●			●		●				●		●	●		●	●			●		

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Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Sulphuric Acid <70%				0 / 20	C2W2	S	F2	N1	Q2					●	●	●	●	●	●			●	●		●	●					●				●	●		●	●						
				0 / 70	C2W2	S	F2	N1	Q2					●	●	●	●	●					●		●	●											●	●		●	●						
Sulphuric Acid <85%				0 / 20	C2W2	S	F2	N1	Q2					●	●	●	●	●	●			●				●					●				●			●	●		●	●						
Sulphuric Acid >85%				0 / 90	C2W2	S	F2	N1	Q2					●	●	●	●									●												●	●		●	●						
Sulphuric Acid Dry				11 / 20	C2W2	S	F2	N1	Q2					●	●	●	●		●			●				●		●			●	●			●			●	●		●	●	●			23	
				11 / 90	C2W2	S	F2	N1	Q2					●	●	●	●									●												●	●		●	●				23	
				11 / 120	C2W2	D	F4	N1	Q1					●	●	●	●									●												●	●		●	●				23	
Sulphurous Acid	-	-	1.0	0 / 70	T2C1	D	F4	N1	Q1		●			●	●	●	●	●					●		●	●								●	●		●	●		●	●				13	
				0 / 100	T2C1	D	F4	N1	Q1		●			●	●	●	●	●					●		●	●									●		●	●		●	●					
Suniso 4GS (see Refrig Oils)																																													
Suniso 5GS (see Refrig Oils)																																													
Super Phosphoric Acid (see Phosphoric Acid,Super)																																													
Tall Oil	-	-	1.0	0 / 120		S	F1	N2	Q1	●	●		●	●	●	●	●	●	●			●	●	●	●	●		●	●	●	●	●					●	●		●	●	●	●	●	6	
				0 / 200		S	F1	N2	Q1		●			●	●	●	●	●	●			●	●	●	●	●		●	●	●	●	●					●			●	●	●	●	●		
Tallow	35	-	.9	35 / 100		S	F1	N1	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●		●	●	●	●	●	4,7	
Tar (Coal)	-	225	1.1	0 / 200	T2C1F1	D	F4	N1	Q1		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●		
Tartaric Acid <20%	0	-	1.8	0 / 30		S	F2	N1	Q1	●	●		●	●	●	●	●	●					●	●	●	●		●		●							●	●		●	●	●		●	5,13	
				0 / 60		S	F2	N1	Q1	●	●		●	●	●	●	●	●					●	●	●	●		●		●							●	●		●	●	●		●		
Tartaric Acid >20%				0 / 60		S	F2	N1	Q5	●	●		●	●	●	●	●	●					●	●	●	●		●		●							●	●		●	●	●		●		
				0 / 100		S	F2	N1	Q5	●	●		●	●	●	●	●	●					●	●	●	●		●		●							●	●		●	●	●		●		
Teepol	-	100	1.0	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●		
Terephthalic Acid, Slurry	0	100	1.5	0 / 100		S	F1	N2	Q1					●	●	●	●	●					●	●	●	●	●	●			●					●	●		●	●	●			3,7	
Tetrachloroethane	-43	147	1.6	-20 / 120	T3C1	D	F4	N1	Q1		●			●	●		●	●					●	●	●	●	●									●	●		●	●					
				-20 / 147	T3C1	D	F4	N1	Q1		●			●	●		●	●					●	●	●	●	●									●			●						
Tetrachloroethane Dry				-20 / 120	T3C1	D	F4	N1	Q1		●			●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	29	
				-20 / 147	T3C1	D	F4	N1	Q1		●			●	●		●	●			●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●		
Tetrachloroethylene (see Perchloroethylene)																																													
Tetrahydrofuran	-65	66	.9	-40 / 100	C1F2	S	F2	N1	Q2							●	●	●	●	●	●	●	●		●	●		●	●		●	●	●					●	●		●	●	●	●			
				-20 / 100	C1F2	S	F2	N1	Q2					●	●	●	●	●	●	●	●	●	●		●	●		●	●		●	●	●					●	●		●	●	●	●			
Thinners, Cellulose Lacquer	-	208	.7	0 / 120	T1F2	S	F2	N1	Q2							●	●	●	●	●	●	●	●		●	●		●	●		●	●	●		●			●	●	●	●	●	●	●			
				0 / 200	T1F2	S	F2	N1	Q2							●	●	●	●	●	●	●	●		●	●		●	●		●	●	●		●			●		●	●	●	●	●			
Thinners, Oil Paint	-50	162	.9	-20 / 120	T1F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●		●			●	●	●	●	●	●	●			
				-20 / 162	T1F2	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●			●		●	●	●	●	●			
Thiols (see Mercaptans)																																													

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	MAT'L DESCR. CODE
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	COMP. MAT'L CODE
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	COMMENTS
Titanium Dioxide Slurry	1857	-	4.2	0 / 100		S	F1	N2	Q5		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	3,5,8,9,10,11,15
Titanium Tetrachloride	-25	136	1.8	-20 / 120	C2W2	D	F4	N1	Q1		●			●	●	●	●	●					●		●	●										●	●		●	●				
Toluene	-95	111	.9	-20 / 100	T1C1F2	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Toluol (see Toluene)																																													
Transformer Oil	-	230	.9	0 / 100		S	F2	N1	Q1	●	●		●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				0 / 120		S	F2	N1	Q1	●	●		●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				0 / 200		S	F2	N1	Q1		●			●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	
Trichloroethane Dry	-38	74	1.3	-20 / 74	T1	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●						●	●	●	●	●	●	●	●	29
Trichloroethylene	-73	87	1.5	-20 / 87	T2C1	D	F4	N1	Q1		●			●	●	●	●	●					●		●	●										●	●		●	●				
Trichloroethylene Dry				-20 / 87	T2C1	D	F4	N1	Q1		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●					●	●	●		●	●	●	●	●	29
Trichloromethane	-64	61	1.5	-40 / 61	T2C1	D	F4	N1	Q1							●	●	●					●	●	●	●				●							●	●		●	●			●	
				-20 / 61	T2C1	D	F4	N1	Q1					●	●	●	●	●					●	●	●	●				●							●			●	●			●	
Trichloromethane Dry				-40 / 61	T2C1	D	F4	N1	Q1							●	●	●		●			●	●	●	●		●	●	●		●			●		●	●		●	●	●	●	●	29
				-20 / 61	T2C1	D	F4	N1	Q1					●	●	●	●	●		●			●	●	●	●		●	●	●		●			●	●	●	●		●	●	●	●	●	
Tricresyl Phosphate	-35	420	1.2	-20 / 135	T3C2	D	F4	N1	Q1		●	●		●	●	●	●	●		●			●		●	●			●							●			●	●			●	
				-20 / 200	T3C2	D	F4	N1	Q1		●			●	●	●	●	●		●			●		●	●			●							●			●	●			●	
				-20 / 215	T3C2	D	F4	N1	Q1					●	●	●	●	●		●			●		●	●			●							●			●	●			●	
				-20 / 250	T3C2	D	F4	N1	Q1						●	●	●	●		●			●		●	●			●							●			●	●				
Triethanolamine	21	335	1.1	0 / 100	T2C1	S	F2	N1	Q2					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				0 / 135	T2C1	S	F2	N1	Q2					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●	●	●	
				0 / 200	T2C1	S	F2	N1	Q2					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●		●	●		●	●	●	●	●	
Triethylamine	-115	90	.7	-40 / 100	T2C1F2	D	F4	N1	Q1	●						●	●	●	●		●	●	●	●	●	●	●	●		●			●	●	●	●	●		●	●		●	●			
				-20 / 100	T2C1F2	D	F4	N1	Q1	●	●		●	●		●	●	●	●		●	●	●	●	●	●	●	●	●		●			●	●	●	●	●		●	●		●	●			
Tung Oil	31	-	.9	31 / 100		S	F1	N1	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	4,7,11
				31 / 200		S	F1	N1	Q5		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
Turpentine	-	162	.9	0 / 100	T1F2	S	F2	N1	Q2	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
				0 / 162	T1F2	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●	●	●	●	●	
Urea <5%	135	-	1.3	0 / 30		S	F2	N1	Q1		●			●	●	●	●	●					●	●	●	●		●				●					●	●		●	●	●			5
				0 / 60		S	F2	N1	Q1		●			●	●	●	●	●					●	●	●	●		●				●					●	●		●	●	●			
Urea >5%				0 / 60		S	F2	N1	Q5		●			●	●	●	●	●					●	●	●	●		●				●					●	●		●	●	●			
				0 / 100		S	F2	N1	Q5		●			●	●	●	●	●					●	●	●	●		●				●					●	●		●	●	●			
Vacuum Residue (see Crude Oil Residue)																																													
Varnish	-	-	1.0	0 / 100	T1F2	D	F2	N1	Q6		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	4

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.

Note 2: ● = Acceptable.

Note 3: Seal performance limits must also be checked.

SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER															FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE	MAT'L DESCR. CODE	COMP. MAT'L CODE	COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1				
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M				
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011				
Vegetable Juice	-	100	1.0	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		13		
Vegetable Oil	-	-	.9	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		13		
				0 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Coconut Oil	25	-	.9	25 / 100		S	F1	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		7,13		
				25 / 120		S	F1	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Corn Oil	-10	-	.9	-10 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		13		
				-10 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Linseed Oil	-19	343	.9	-19 / 100		S	F2	N1	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		4,11		
				-19 / 120		S	F2	N1	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Olive Oil	-6	-	.9	-6 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		13		
				-6 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Palm Oil	30	-	.9	30 / 100		S	F1	N2	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		3,4,7,11		
				30 / 120		S	F1	N2	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Peanut Oil	3	-	.9	3 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		13		
				3 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Pine Oil	-	210	.9	0 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
				0 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Rapeseed Oil	-6	-	.9	-6 / 100		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		7,13		
				-6 / 120		S	F2	N1	Q1	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vegetable Oil, Soya Bean Oil	22	-	.9	22 / 100		S	F1	N1	Q3	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●		4,7,11,13		
				22 / 120		S	F1	N1	Q5	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●				
Vinegar	17	118	1.0	0 / 118	C1	S	F2	N1	Q2		●	●		●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●							●	●	●	●	●		13		
Vinyl Acetate	-100	73	.9	-40 / 73	T1C1F2	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●			
				-20 / 73	T1C1F2	S	F2	N1	Q2				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●			
Vinyl Chloride, Gas	-160	-14	.9	-14 / 25	T2C1F2	D	F4	N1	Q1		●			●	●	●	●	●					●	●	●	●				●								●	●		●	●				●	17		
Vinyl Chloride, Gas Dry				-14 / 25	T2C1F2	D	F4	N1	Q1		●			●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●						●	●		●	●	●	●	●	●	29		
Vinyl Chloride, Liquid	-160	-13	.9	-20 / 25	T2C1F2	D	F4	N1	Q1		●			●	●	●	●	●					●	●	●	●				●								●	●		●	●				●			
Vinyl Chloride, Liquid Dry				-20 / 25	T2C1F2	D	F4	N1	Q1		●			●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●						●	●		●	●	●	●	●	●	29		
Vinylbenzene	-31	145	.9	-30 / 100	T1F1	S	F2	N1	Q2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●		●	●	●	●	●			
Vinylidene Chloride (see Dichloro Ethylene (1,1))																																															
Waste Liquor, Sulphite (see Sulphite Waste Liquor)																																															
Water Deionised (Demin.)	0	100	1.0	0 / 120		S	F2	N1	Q1		●	●		●		●	●	●	●	●	●	●			●		●		●	●	●	●	●	●			●	●		●	●	●	●	●				
Water, Boiler Feed	0	100	1.0	0 / 120		S	F2	N1	Q1		●	●	●	●		●	●	●	●	●	●	●			●	●	●		●	●		●	●	●		●		●	●		●	●	●	●	●		20		
				0 / 130		S	F2	N1	Q1		●	●	●	●		●	●	●	●	●	●	●			●	●	●		●	●		●	●	●		●		●	●		●	●	●	●	●				

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Note 1: Please refer to fold-out page 44i/ii for key to column headings, codes and comments.
Note 2: ● = Acceptable.
Note 3: Seal performance limits must also be checked.

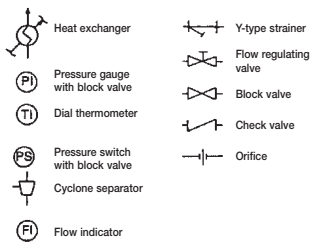
SEALED FLUID	MELTING POINT (°C)	BOILING POINT (°C)	SPECIFIC GRAVITY	SEALED TEMPERATURE (°C) MIN. / MAX.	HAZARD CODES	ARRANGEMENT	FLUSH	NECK	SECONDARY CONTAINMENT	FLEXIBLE MEMBER														FACE / PRIMARY RING					METAL PARTS									SEAT / MATING RING					SPRINGS			DIN MATERIAL CODE / MAT'L DESCR. CODE / COMP. MAT'L CODE / COMMENTS
										P	V	E	P1	K	K	T	Y1	G2	T	M2	T8	T	B	A2	B	Q1	U2	G	M2	M1	G1	G	T5	T7	M3	T1	S	V	R	Q2	S	G	M2	M1	
										B	A	G	D	X	X	Q	W	X	P	H	X	X	R	U	X	S	5	1	H	M	X	X	X	X	X	X	S	C	7	X	X	1	H	M	
										130	134	135	461	394	230	138	139	212	334	033	208	611	171	218	369	277	005	001	033	011	015	224	013	244	038	032	277	059	007	509	469	001	033	011	
Water, Chlorinated (<500ppm)	0	100	1.0	0 / 30	T1	S	F2	N1	Q2		●			●	●	●	●	●		●			●	●	●	●		●	●	●	●	●					●	●		●	●	●	●	●	
Water, Dirty	0	100	1.0	0 / 100		S	F3	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	3
Water, Drinking (Potable)	0	100	1.0	0 / 80		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	
Water, Formation (see Water, Produced)																																												
Water, Hot	0	100	1.0	0 / 130		S	F2	N1	Q1		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●		●	●	●	●	●	●	20
Water, Injection	0	100	1.0	0 / 100		S	F2	N1	Q1		●			●	●	●	●	●		●			●		●	●			●	●							●	●		●	●		●	●	
Water, Produced	0	100	1.0	0 / 60		S	F3	N1	Q1	●	●		●	●	●	●	●	●		●			●	●	●	●			●	●	●						●	●		●	●		●	●	3,5
				0 / 100		S	F3	N1	Q5	●	●		●	●	●	●	●	●		●			●	●	●	●			●	●	●						●	●		●	●		●	●	
				0 / 120		S	F3	N1	Q5		●			●		●	●	●					●	●	●	●				●							●	●		●	●			●	
Water, Sea (Dirty)	0	100	1.0	0 / 60		S	F3	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	3,5
				0 / 100		S	F3	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	
Water, Sea - max20,000 mg/litre Cl ion	-3	101	1.0	0 / 60		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	5
				0 / 100		S	F2	N1	Q5	●	●	●	●	●	●	●	●	●		●			●	●	●	●			●	●						●	●	●		●	●		●	●	
				0 / 120		S	F2	N1	Q5		●	●		●		●	●	●		●			●	●	●	●			●							●	●	●		●	●			●	
Water, Sour (H2S Only)	0	100	1.0	0 / 100	T1	S	F2	N1	Q2			●		●	●	●	●	●		●	●		●		●	●		●	●		●	●	●				●	●		●	●	●	●		
Water, Ultra Pure (>10 MOhm/cm)	0	100	1.0	0 / 100		S	F2	N1	Q1	●	●	●	●	●	●	●	●	●	●	●	●	●			●		●		●	●		●	●	●		●	●		●	●		●	●	
				0 / 120		S	F2	N1	Q1		●	●	●	●		●	●	●	●	●	●	●		●		●			●	●		●	●	●		●	●		●	●		●	●	
Whisky	-	100	.9	0 / 100	F1	S	F2	N1	Q2	●	●	●	●			●	●	●	●	●	●	●		●		●	●	●	●	●		●	●	●		●	●		●	●		●	●	
White Liquor	-	100	1.0	0 / 120	T1C1	S	F1	N2	Q5			●		●	●	●	●	●	●			●	●		●	●		●			●	●					●	●		●	●	●			3,5,6,22,27
				0 / 180	T1C1	S	F1	N2	Q5					●	●	●	●	●	●			●	●		●	●		●			●	●					●			●	●	●			
White Water (see Paper Stock 1%)																																												
Wine	-	100	1.0	0 / 100	F1	S	F2	N1	Q2	●	●	●	●			●	●	●	●	●	●	●		●		●	●	●	●	●		●	●	●			●	●		●	●	●	●	
Wood Pulp (see Paper Stock)																																												
Wort (see Beer Wort)																																												
Xylene	-47	139	.9	-20 / 120	T1C1F2	S	F2	N1	Q2		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●			●	●		●	●	●	●	●	
Yeast	-	100	1.0	0 / 60		S	F2	N1	Q1	●			●			●	●	●	●	●	●	●	●		●	●	●		●	●	●						●	●		●	●	●	●		
Zerice (see Refrig Oils)																																												
Zinc Chloride	290	-	2.9	0 / 100	T1C2	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●		●			●		●	●			●					●			●	●		●	●		●		5
Zinc Nitrate	0	-	2.1	0 / 60	T1C1O2	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●		●	●		●	●								●	●		●	●		●	●	5
				0 / 100	T1C1O2	S	F2	N1	Q5					●	●	●	●	●	●	●		●	●		●	●		●	●								●	●		●	●		●	●	
Zinc Sulphate <45%	0	-	2.0	0 / 60	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●		●			●	●				●	●		●	●		●		5,7,13
				0 / 100	T1	S	F2	N1	Q5	●	●	●	●	●	●	●	●	●					●	●	●	●		●			●	●				●	●		●	●		●		
Zinc Sulphate >45%				0 / 100	T1	D	F4	N1	Q1	●	●	●	●	●	●	●	●	●					●	●	●	●										●	●		●	●				

E & OE

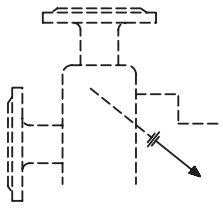
Reference Data for Selection Pages

API Plans

API PLAN LEGEND

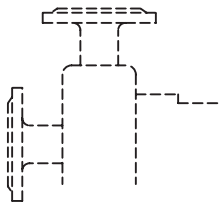


API PLAN 01



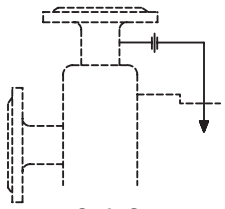
Arrangement Code S
Flush Code F2
Secondary Containment –

API PLAN 02



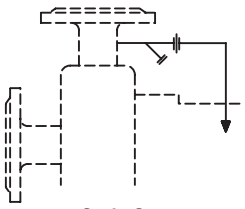
Arrangement Code S
Flush Code F1
Secondary Containment –

API PLAN 11



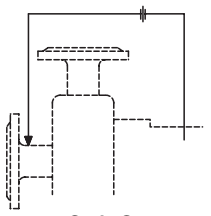
Arrangement Code S
Flush Code F2
Secondary Containment –

API PLAN 12



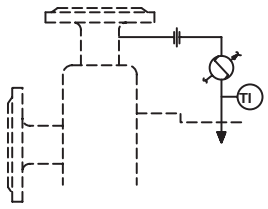
Arrangement Code S
Flush Code F3
Secondary Containment –

API PLAN 13



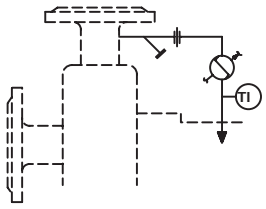
Arrangement Code S
Flush Code F2
Secondary Containment –

API PLAN 21



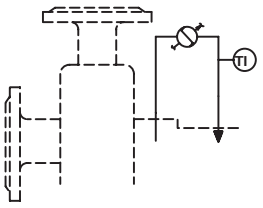
Arrangement Code S
Flush Code F2
Secondary Containment –

API PLAN 22



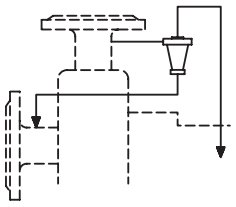
Arrangement Code S
Flush Code F3
Secondary Containment –

API PLAN 23



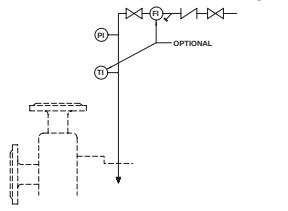
Arrangement Code S/D
Flush Code -
Secondary Containment –

API PLAN 31



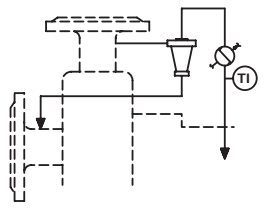
Arrangement Code S
Flush Code F3
Secondary Containment –

API PLAN 32



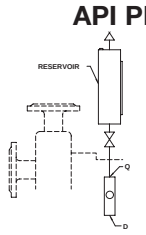
Arrangement Code S
Flush Code F3
Secondary Containment –

API PLAN 41



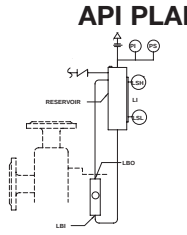
Arrangement Code S
Flush Code F3
Secondary Containment –

API PLAN 51



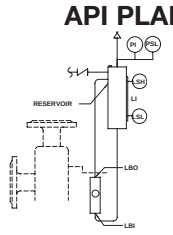
Arrangement Code S/D
Flush Code –
Secondary Containment Q3

API PLAN 52



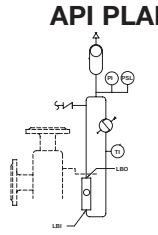
Arrangement Code D
Flush Code –
Secondary Containment Q6

API PLAN 53A



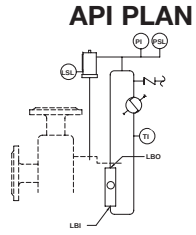
Arrangement Code D
Flush Code F4
Secondary Containment –

API PLAN 53B



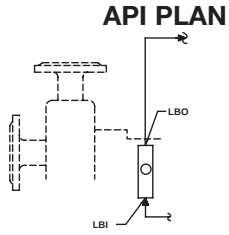
Arrangement Code D
Flush Code F4
Secondary Containment –

API PLAN 53C



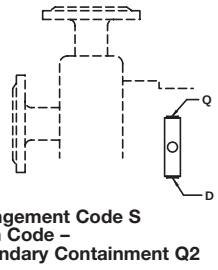
Arrangement Code D
Flush Code F4
Secondary Containment –

API PLAN 54



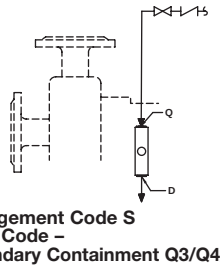
Arrangement Code D
Flush Code F4
Secondary Containment –

API PLAN 61



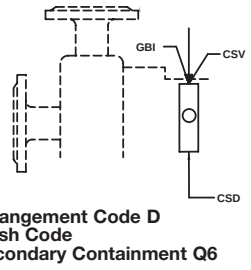
Arrangement Code S
Flush Code –
Secondary Containment Q2

API PLAN 62



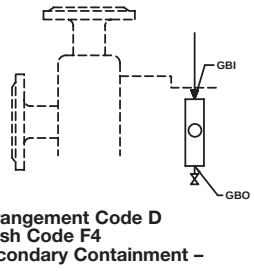
Arrangement Code S
Flush Code –
Secondary Containment Q3/Q4/Q5

API PLAN 72



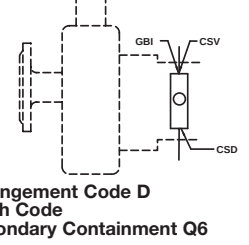
Arrangement Code D
Flush Code
Secondary Containment Q6

API PLAN 74



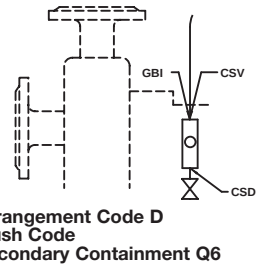
Arrangement Code D
Flush Code F4
Secondary Containment –

API PLAN 75



Arrangement Code D
Flush Code
Secondary Containment Q6

API PLAN 76



Arrangement Code D
Flush Code
Secondary Containment Q6

E & OE

Hazard Code

T = Toxicity
C = Corrosive to Tissue
F = Flammable
W = Water Reactive
O = Oxidising
E = Explosive
S = Spontaneously Combustible

See page 6

Arrangement Code

S = Single Seal
D = Dual Seal

See page 7

Flush Code

F1 = None = API Plan 02
F2 = Product Recirculation = API Plans 01, 11, 13 and 21
F3 = Clean Flush = API Plans 12, 22, 31, 32 and 42
F4 = Double Seal Pressurised Barrier = API Plans 53 and 54
F5 = Upstream Pumping
F6 = API Plan 74,75,76

See page 8

Neck Code

N1 = No Special Requirements
N2 = Large Bore or Tapered Housing
N3 = Moderate Restriction
N4 = Severe Restriction

See page 8

Recommended Material Description	Comp. Mat'l Code	Mat'l Descr. Code	DIN Mat'l Code
Flexible Member			
Nitrile	130	B	P
Chloroprene	132	N	N
Fluorocarbon	134	A	V
Ethylene Propylene	135	G	E
Nitrile (HNBR)	461	D	P1
Perfluoroelastomer	394	X	K
Perfluoroelastomer	230	X	K
Pure PTFE	138	Q	T
Glass Filled PTFE	198	W	Y1
Exfoliated Graphite	212	X	G2
Inconel Alloy 718	334	P	T
Alloy C-276	033	H	M2
AM350 Stainless Steel	208	X	T8
Inconel 718 (NACE heat treatment)	611	X	T
Face/Primary Ring			
Resin Impregnated Carbon Graphite	171	R	B
Antimony Impregnated Carbon Graphite	218	U	A2
Resin Impregnated Carbon Graphite	369	X	B
Antimony Impregnated Carbon Graphite	348	X	B
Nickel/Chrome Impregnated Carbon Graphite	605	X	A
Sintered Silicon Carbide	277	S	Q1
Silicon Carbide Coated Graphite	121	J	Q4
Nickel Bonded Tungsten Carbide	005	5	U2
Metal Parts			
316 Stainless Steel	001	1	G
Alloy C-276	033	H	M2
Alloy 400 (Monel)	011	M	M1
FV520B Stainless Steel	207	X	G2
Duplex Stainless Steel	015	X	G1
316L Stainless Steel	224	X	G
17–4 PH Stainless Steel	013	X	T5
Iron/Nickel Low Expansion Alloy	244	X	T7
20Cb-3 Stainless Steel	038	X	M3
Titanium	032	X	T1
Seat/Mating Ring			
Sintered Silicon Carbide	277	S	Q1
99.5% Aluminium Oxide Ceramic	059	C	V
Austenitic Cast Iron	007	7	R
Cobalt Bonded Tungsten Carbide	025	K	U1
Silicon Carbide (Banded)	469	X	Q1
Springs			
316 Stainless Steel	001	1	G
Alloy C-276	033	H	M2
Alloy 400 (Monel)	011	M	M1

Selection Comments

1 = Refer to John Crane where no selection shown
2 = Confirm Selection at Very High Temperatures
3 = Abrasive
4 = Atmospheric Deposits
5 = Crystallises
6 = Clogging
7 = Heated Environment
8 = Avoid Springs in Product
9 = Stationary-Mounted Seal
10 = Vortex Breaker
11 = Q5 – Steam Quench
12 = Q5 – Hot Water Quench
13 = FDA Materials Available
14 = Refer to Refinery Section
15 = Refer to Pulp & Paper Section
16 = Refer to Positive Displacement Pump Section
17 = Consider Dry Gas Seal
18 = Check Refrigeration Oil Materials
19 = Check Refrigeration Fluid Materials
20 = Refer to John Crane for Higher Temps and Exceptions
21 = 033 Acceptable for Springs
22 = Quench fluid contained by a Mech. Seal above 80ºC
23 = Dry = >98%
24 = Less than 40% Gypsum
25 = From Wet Process
26 = From Thermal Process
27 = Pressure Surges C4 Stage
28 = See family sections for specialised face materials
29 = Dry = No water in fluid
30 = < 2000ppm H_2S. Refer to John Crane for higher levels

See page 10

Secondary Containment Code

Q1 = None
Q2 = Leakage Containment = API Plan 61
Q3 = Static Quench = API Plan 51
Q4 = Intermittent Quench = API Plan 61
Q5 = Continuous Quench = API Plan 62
Q6 = Tandem Seal = API Plans 51, 52, 72, 75 and 76
Q7 = Splash Guard

See page 9

Hazard Code

T = Toxicity
C = Corrosive to Tissue
F = Flammable
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See page 6

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See page 7

Flush Code

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See page 8

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Perfluoroelastomer	230	X	K
Pure PTFE	138	Q	T
Glass Filled PTFE	198	W	Y1
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Antimony Impregnated Carbon Graphite	348	X	B
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Metal Parts			
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Alloy C-276	033	H	M2
Alloy 400 (Monel)	011	M	M1
FV520B Stainless Steel	207	X	G2
Duplex Stainless Steel	015	X	G1
316L Stainless Steel	224	X	G
17–4 PH Stainless Steel	013	X	T5
Iron/Nickel Low Expansion Alloy	244	X	T7
20Cb-3 Stainless Steel	038	X	M3
Titanium	032	X	T1
Seat/Mating Ring			
Sintered Silicon Carbide	277	S	Q1
99.5% Aluminium Oxide Ceramic	059	C	V
Austenitic Cast Iron	007	7	R
Cobalt Bonded Tungsten Carbide	025	K	U1
Silicon Carbide (Banded)	469	X	Q1
Springs			
316 Stainless Steel	001	1	G
Alloy C-276	033	H	M2
Alloy 400 (Monel)	011	M	M1

Selection Comments

1 = Refer to John Crane where no selection shown
2 = Confirm Selection at Very High Temperatures
3 = Abrasive
4 = Atmospheric Deposits
5 = Crystallises
6 = Clogging
7 = Heated Environment
8 = Avoid Springs in Product
9 = Stationary-Mounted Seal
10 = Vortex Breaker
11 = Q5 – Steam Quench
12 = Q5 – Hot Water Quench
13 = FDA Materials Available
14 = Refer to Refinery Section
15 = Refer to Pulp & Paper Section
16 = Refer to Positive Displacement Pump Section
17 = Consider Dry Gas Seal
18 = Check Refrigeration Oil Materials
19 = Check Refrigeration Fluid Materials
20 = Refer to John Crane for Higher Temps and Exceptions
21 = 033 Acceptable for Springs
22 = Quench fluid contained by a Mech. Seal above 80ºC
23 = Dry = >98%
24 = Less than 40% Gypsum
25 = From Wet Process
26 = From Thermal Process
27 = Pressure Surges C4 Stage
28 = See family sections for specialised face materials
29 = Dry = No water in fluid
30 = < 2000ppm H_2S. Refer to John Crane for higher levels

See page 10

Secondary Containment Code

Q1 = None
Q2 = Leakage Containment = API Plan 61
Q3 = Static Quench = API Plan 51
Q4 = Intermittent Quench = API Plan 61
Q5 = Continuous Quench = API Plan 62
Q6 = Tandem Seal = API Plans 51, 52, 72, 75 and 76
Q7 = Splash Guard

See page 9

Group Material Codes

For material combinations not shown refer to John Crane.

Seal Material Description Code			Group Material Code	Component Material Codes					
				Flexible Member		Face/ Primary Ring	Metal Parts	Seat/ Mating Ring	Springs
				Sec. Seal	Static Seal				
A R 1 7 1			354A	134	-	171	001	007	001
A R 1 C 1			352A	134	-	171	001	059	001
A R 1 S 1			546C	134	-	171	001	277	001
A R 1 S H			402D	134	-	171	001	277	033
A R H S H			749D	134	-	171	033	277	033
A R M C M			357A	134	-	171	011	059	011
A R M S M			448D	134	-	171	011	277	011
A S 1 S 1			397D	134	-	277	001	277	001
A S H S H			742D	134	-	277	033	277	033
B R 1 7 1			387A	130	-	171	001	007	001
B R 1 C 1			384A	130	-	171	001	059	001
B R 1 S 1			753C	130	-	171	001	277	001
B R M C M			379A	130	-	171	011	059	011
B S 1 S 1			419D	130	-	277	001	277	001
B S M S M			368D	130	-	277	011	277	011
G R 1 7 1			468A	135	-	171	001	007	001
G R 1 C 1			466A	135	-	171	001	059	001
G R 1 S 1			530C	135	-	171	001	277	001
G R H C H			530B	135	-	171	033	059	033
G R M C M			531A	135	-	171	011	059	011
G S 1 S 1			540C	135	-	277	001	277	001
G S H S H			374C	135	-	277	033	277	033
G S M S M			508D	135	-	277	011	277	011
G S M S M			529C	135	-	277	011	277	011
G U 1 C 1			476C	135	-	218	001	059	001
G U 1 S 1			477C	135	-	218	001	277	001
G U M S M			257F	135	-	218	011	277	011
H A S H S -			819E	033	134	277	033	277	-
H A X H S -		X=369	853E	033	134	369	033	277	-
H B S H S -			286F	033	130	277	033	277	-
H B X H S -		X=369	623E	033	130	369	033	277	-
H X S H S -		X=230	622E	033	230	277	033	277	-
N R 1 C 1			431A	132	-	171	001	059	001
P A R X C -		X=207	809C	334	134	171	207	059	-
P A R X S -		X=207	644C	334	134	171	207	277	-
P A R X S -		X=207	808C	334	134	171	207	277	-
P B R X 7 -		X=207	800C	334	130	171	207	007	-
P B R X C -		X=207	801C	334	130	171	207	059	-
P B R X S -		X=207	931D	334	130	171	207	277	-
P G R X S -		X=207	640C	334	135	171	207	277	-
P X J X S -	X=230	X=207	648D	334	230	121	207	277	-
Q R 1 7 1			244A	138	-	171	001	007	001
Q R 1 C 1			234D	138	-	171	001	059	001
Q R 1 S 1			602C	138	-	171	001	277	001
Q R H C H			308A	138	-	171	033	059	033
Q R H S H			555D	138	-	171	033	277	033
Q R M S M			309B	138	-	171	011	277	011
Q S 1 S 1			753A	138	-	277	001	277	001
Q X 1 C X	X=195	X=093	656A	138	198	198	001	059	093

Group Material Codes (continued)

Seal Material Description Code			Group Material Code	Component Material Codes					
				Flexible Member		Face/ Primary Ring	Metal Parts	Seat/ Mating Ring	Springs
				Sec. Seal	Static Seal				
Q X S 1 S X	X=195	X=093	606D	138	198	277	001	277	093
W R 1 7 1			262A	198	-	171	001	007	001
W R 1 S 1			214D	198	-	171	001	277	001
W R 1 S 1			255C	198	-	171	001	277	001
W S 1 S 1			201D	198	-	277	001	277	001
X R 1 7 1		X=230	391C	230	-	171	001	007	001
X R 1 C 1		X=230	390C	230	-	171	001	059	001
X R 1 S 1		X=230	780C	230	-	171	001	277	001
X R 1 S H		X=230	285F	230	-	171	001	227	033
X S 1 S 1		X=230	379E	230	-	277	001	277	001
X S 1 S 1		X=212	583C	212	-	277	001	277	001
X X 5 1 S -	X=454	X=212	842E	334	212	005	001	277	-
X X 5 1 S -	X=462	X=212	910E	208	212	005	001	277	-
X X X 1 S -	X=276	X=212 X=369	855E	208	212	369	001	277	-
X X X 1 S -	X=462	X=212 X=369	849E	208	212	369	001	277	-

Alternative Materials

Material Description	Component Material Code	Material Description Code	DIN Material Code
Hard-Faced Stainless Steel	009	9	K
Hard-Faced Alloy 400	010	L	T(4)
Hastelloy B-2	012	X	M
Chrome Oxide on 316 Stainless Steel	031	X	W
Titanium	032	X	T(1)
Carpenter 20 Cb-3 Stainless Steel	038	X	G(3)
PVDF Coated 316 Stainless Steel	093	X	T(2)
Compressed Fibre	140	V	Y
PTFE Coated Stainless Steel	146	X	T(2)
Gasket Grade PTFE	157	Q(W)	T
Carbon Filled PTFE	180	X	Y2
Composite Filled/Pure/Filled PTFE	195	X	—
Glass Filled PTFE	198	X	Y1
304 Stainless Steel	200	X	F
Low Carbon 316 Stainless Steel	224	X	G
Nitrile (FDA)	234	X	P(1)
Ethylene Propylene (FDA)	235	X	E(2)
Iron-Nickel Low Expansion Alloy	244	X	T(7)
Inconel X-750	246	X	T(9)
FEP Jacketed Fluorocarbon	282	X	M(4)
SS Reinforced Exfoliated Graphite	323	X	G(1)
904L Stainless Steel	429	X	G(5)
Resin Impregnated Carbon Graphite	444	R	B
Antimony Impregnated Carbon Graphite	448	U	A(2)
Ethylene Propylene (EDF)	449	G	E
SiC/Silicon/Graphite Compound	477	X	Q3
320 Stainless Steel	475	X	G
Reaction Bonded Silicon Carbide	509	S	Q2
Resin Impregnated Carbon Graphite	539	X	B

Note: DIN code numbers shown in brackets indicate John Crane DIN code additions.

Temperature Conversion Table

Find the temperature you want to convert (°C or °F) in the centre column (heavy type).
The converted temperature in °C will be in the left hand column, or in °F in the right hand column.

°C		°F
–62.2	**–80**	–112.0
–56.7	**–70**	–94.0
–51.1	**–60**	–76.0
–45.6	**–50**	–58.0
–40.0	**–40**	–40.0
–34.4	**–30**	–22.0
–28.9	**–20**	–4.0
–23.3	**–10**	14.0
–17.8	**0**	32.0
–17.2	**1**	33.8
–16.7	**2**	35.6
–16.1	**3**	37.4
–15.6	**4**	39.2
–15.0	**5**	41.0
–14.4	**6**	42.8
–13.9	**7**	44.6
–13.3	**8**	46.4
–12.8	**9**	48.2
–12.2	**10**	50.0
–11.7	**11**	51.8
–11.1	**12**	53.6
–10.6	**13**	55.4
–10.0	**14**	57.2
–9.4	**15**	59.0
–8.9	**16**	60.8
–8.3	**17**	62.6
–7.8	**18**	64.4
–7.2	**19**	66.2
–6.7	**20**	68.0
–6.1	**21**	69.8
–5.6	**22**	71.6
–5.0	**23**	73.4
–4.4	**24**	75.2
–3.9	**25**	77.0
–3.3	**26**	78.8
–2.8	**27**	80.6
–2.2	**28**	82.4
–1.7	**29**	84.2
–1.1	**30**	86.0
–0.6	**31**	87.8
0	**32**	89.6
0.6	**33**	91.4
1.1	**34**	93.2
1.7	**35**	95.0
2.2	**36**	96.8
2.8	**37**	98.6

°C		°F
3.3	**38**	100.4
3.9	**39**	102.2
4.4	**40**	104.0
5.0	**41**	105.8
5.6	**42**	107.6
6.1	**43**	109.4
6.7	**44**	111.2
7.2	**45**	113.0
7.8	**46**	114.8
8.3	**47**	116.6
8.9	**48**	118.4
9.4	**49**	120.2
10.0	**50**	122.0
10.6	**51**	123.8
11.1	**52**	125.6
11.7	**53**	127.4
12.2	**54**	129.2
12.8	**55**	131.0
13.3	**56**	132.8
13.9	**57**	134.6
14.4	**58**	136.4
15.0	**59**	138.2
15.6	**60**	140.0
16.1	**61**	141.8
16.7	**62**	143.6
17.2	**63**	145.4
17.8	**64**	147.2
18.3	**65**	149.0
18.9	**66**	150.8
19.4	**67**	152.6
20.0	**68**	154.4
20.6	**69**	156.2
21.1	**70**	158.0
21.7	**71**	159.8
22.2	**72**	161.6
22.8	**73**	163.4
23.3	**74**	165.2
23.9	**75**	167.0
24.4	**76**	168.8
25.0	**77**	170.6
25.6	**78**	172.4
26.1	**79**	174.2
26.7	**80**	176.0
27.2	**81**	177.8
27.8	**82**	179.6
28.3	**83**	181.4

°C		°F
28.9	**84**	183.2
29.4	**85**	185.0
30.0	**86**	186.8
30.6	**87**	188.6
31.1	**88**	190.4
31.7	**89**	192.2
32.2	**90**	194.0
32.8	**91**	195.8
33.3	**92**	197.6
33.9	**93**	199.4
34.4	**94**	201.2
35.0	**95**	203.0
35.6	**96**	204.8
36.1	**97**	206.6
36.7	**98**	208.4
37.2	**99**	210.2
37.8	**100**	212.0
38.3	**101**	213.8
38.9	**102**	215.6
39.4	**103**	217.4
40.0	**104**	219.2
40.6	**105**	221.0
41.1	**106**	222.8
41.7	**107**	224.6
42.2	**108**	226.4
42.8	**109**	228.2
43.3	**110**	230.0
43.9	**111**	231.8
44.4	**112**	233.6
45.0	**113**	235.4
45.6	**114**	237.2
46.1	**115**	239.0
46.7	**116**	240.8
47.2	**117**	242.6
47.8	**118**	244.4
48.3	**119**	246.2
48.9	**120**	248.0
49.4	**121**	249.8
50.0	**122**	251.6
50.6	**123**	253.4
51.1	**124**	255.2
51.7	**125**	257.0
52.2	**126**	258.8
52.8	**127**	260.6
53.3	**128**	262.4
53.9	**129**	264.2

°C		°F
54.4	**130**	266.0
55.0	**131**	267.8
55.6	**132**	269.6
56.1	**133**	271.4
56.7	**134**	273.2
57.2	**135**	275.0
57.8	**136**	276.8
58.3	**137**	278.6
58.9	**138**	280.4
59.4	**139**	282.2
60.0	**140**	284.0
60.6	**141**	285.8
61.1	**142**	287.6
61.7	**143**	289.4
62.2	**144**	291.2
62.8	**145**	293.0
63.3	**146**	294.8
63.9	**147**	296.6
64.4	**148**	298.4
65.0	**149**	300.2
65.6	**150**	302.0
66.1	**151**	303.8
66.7	**152**	305.6
67.2	**153**	307.4
67.8	**154**	309.2
68.3	**155**	311.0
68.9	**156**	312.8
69.4	**157**	314.6
70.0	**158**	316.4
70.6	**159**	318.2
71.1	**160**	320.0
71.7	**161**	321.8
72.2	**162**	323.6
72.8	**163**	325.4
73.3	**164**	327.2
73.9	**165**	329.0
74.4	**166**	330.8
75.0	**167**	332.6
75.6	**168**	334.4
76.1	**169**	336.2
76.7	**170**	338.0
77.2	**171**	339.8
77.8	**172**	341.6
78.3	**173**	343.4
78.9	**174**	345.2
79.4	**175**	347.0

°C		°F
80.0	**176**	348.8
80.6	**177**	350.6
81.1	**178**	352.4
81.7	**179**	354.2
82.2	**180**	356.0
82.8	**181**	357.8
83.3	**182**	359.6
83.9	**183**	361.4
84.4	184	363.2
85.0	**185**	365.0
85.6	**186**	366.8
86.1	**187**	368.6
86.7	**188**	370.4
87.2	**189**	372.2
87.8	**190**	374.0
88.3	**191**	375.8
88.9	**192**	377.6
89.4	**193**	379.4
90.0	**194**	381.2
90.6	**195**	383.0
91.1	**196**	384.8
91.7	**197**	386.6
92.2	**198**	388.4
92.8	**199**	390.2
93.3	**200**	392.0
96.1	**205**	401.0
98.9	**210**	410.0
101.7	**215**	419.0
104.4	**220**	428.0
107.2	**225**	437.0
110.0	**230**	446.0
112.8	**235**	455.0
115.6	**240**	464.0
118.3	**245**	473.0
121.1	**250**	482.0
123.9	**255**	491.0
126.7	**260**	500.0
129.4	**265**	509.0
132.2	**270**	518.0
135.0	**275**	527.0
137.8	**280**	536.0
140.6	**285**	545.0
143.3	**290**	554.0
146.1	**295**	563.0
148.9	**300**	572.0
151.7	**305**	581.0

°C		°F
154.4	**310**	590.0
157.2	**315**	599.0
160.0	**320**	608.0
162.8	**325**	617.0
165.6	**330**	626.0
168.3	**335**	635.0
171.1	**340**	644.0
173.9	**345**	653.0
176.7	**350**	662.0
179.4	**355**	671.0
182.2	**360**	680.0
185.0	**365**	689.0
187.8	**370**	698.0
190.6	**375**	707.0
193.3	**380**	716.0
196.1	**385**	725.0
198.9	**390**	734.0
201.7	**395**	743.0
204.4	**400**	752.0
207.2	**405**	761.0
210.0	**410**	770.0
212.8	**415**	779.0
215.6	**420**	788.0
218.3	**425**	797.0
221.1	**430**	806.0
223.9	**435**	815.0
226.7	**440**	824.0
229.4	**445**	833.0
232.0	**450**	842.0
235.2	**455**	851.0
237.8	**460**	860.0
240.6	**465**	869.0
243.3	**470**	878.0
246.1	**475**	887.0
248.9	**480**	896.0
251.7	**485**	905.0
254.4	**490**	914.0
257.2	**495**	923.0
260.0	**500**	932.0
265.6	**510**	950.0
271.1	**520**	968.0
276.7	**530**	986.0
282.2	**540**	1004.0
287.8	**550**	1022.0
293.3	**560**	1040.0
298.9	**570**	1058.0

°C		°F
304.4	**580**	1076.0
310.0	**590**	1094.0
315.6	**600**	1112.0
321.1	**610**	1130.0
326.7	**620**	1148.0
332.2	**630**	1166.0
337.8	**640**	1184.0
343.3	**650**	1202.0
348.9	**660**	1220.0
354.4	**670**	1238.0
360.0	**680**	1256.0
365.6	**690**	1274.0
371.1	**700**	1292.0
376.7	**710**	1310.0
382.2	**720**	1328.0
387.8	**730**	1346.0
393.3	**740**	1364.0
398.9	**750**	1382.0
404.4	**760**	1400.0
410.0	**770**	1418.0
415.6	**780**	1436.0
421.1	**790**	1454.0
426.7	**800**	1472.0
432.2	**810**	1490.0
437.8	**820**	1508.0
443.3	**830**	1526.0
448.9	**840**	1544.0
454.4	**850**	1562.0
460.0	**860**	1580.0
465.6	**870**	1598.0
471.1	**880**	1616.0
476.7	**890**	1634.0
482.2	**900**	1652.0
487.8	**910**	1670.0
493.3	**920**	1688.0
498.9	**930**	1706.0
504.4	**940**	1724.0
510.0	**950**	1742.0
515.6	**960**	1760.0
521.1	**970**	1778.0
526.7	**980**	1796.0
532.2	**990**	1814.0
537.8	**1000**	1832.0

Seal Size Codes

Metric Seal Sizes

Seal Size (mm)	Seal Size Code
8	0080
10	0100
12	0120
13	0130
14	0140
15	0150
16	0160
17	0170
18	0180
19	0190
20	0200
22	0220
23	0230
24	0240
25	0250
28	0280
30	0300
32	0320
33	0330
35	0350
38	0380
40	0400
43	0430
45	0450
48	0480
50	0500
53	0530
55	0550
58	0580
60	0600

Seal Size (mm)	Size Size Code
63	0630
65	0650
68	0680
70	0700
73	0730
75	0750
78	0780
80	0800
83	0830
85	0850
88	0880
90	0900
93	0930
95	0950
98	0980
100	1000
105	1050
110	1100
115	1150
120	1200
125	1250
130	1300
135	1350
140	1400
145	1450
150	1500
155	1550
160	1600
165	1650
170	1700

Inch Seal Sizes

Seal Size (Decimal Inches)	Seal Size Code	Seal Size (Fractional Inches)
0.375	0095	3/8
0.500	0127	1/2
0.625	0158	5/8
0.750	0190	3/4
0.813	0206	1 3/16
0.875	0222	7/8
1.000	0254	1
1.125	0285	1 1/8
1.250	0317	1 1/4
1.375	0349	1 3/8
1.500	0381	1 1/2
1.625	0412	1 5/8
1.750	0444	1 3/4
1.875	0476	1 7/8
2.000	0508	2
2.125	0539	2 1/8
2.250	0571	2 1/4
2.375	0603	2 3/8
2.500	0635	2 1/2
2.625	0666	2 5/8
2.750	0698	2 3/4
2.875	0730	2 7/8
3.000	0762	3
3.125	0793	3 1/8

Seal Size (Decimal Inches)	Seal Size Code	Seal Size (Fractional Inches)
3.250	0825	3 1/4
3.375	0857	3 3/8
3.500	0889	3 1/2
3.625	0920	3 5/8
3.750	0952	3 3/4
3.875	0984	3 7/8
4.000	1016	4
4.125	1047	4 1/8
4.250	1079	4 1/4
4.375	1111	4 3/8
4.500	1143	4 1/2
4.625	1174	4 5/8
4.750	1206	4 3/4
4.875	1238	4 7/8
5.000	1270	5
5.125	1301	5 1/8
5.250	1333	5 1/4
5.375	1365	5 3/8
5.500	1397	5 1/2
5.625	1428	5 5/8
5.750	1460	5 3/4
5.875	1492	5 7/8
6.000	1524	6