

## CATALOGUE TERMS

### General Terms

- As it is our policy to maintain a programme of continuous improvement, it is possible that the specification of some products supplied may differ slightly from the description stated in this publication.
- Prices exclude VAT.
- This cancels all previous price lists.
- We reserve the right to change prices without notice.
- Please scan the QR codes to check for price updates.

### Payment Terms

- No minimum order charge for account customers.
- Approved monthly accounts to be settled at 30 days from the date of invoice.
- A £16.00 minimum order value will apply to cash and credit card transactions.
- For cash sale transactions, cheques will be cleared prior to despatch of the goods.

### Conditions Of Sale

This catalogue is subject to our standard conditions of sale. To obtain a copy of our terms & conditions please contact our sales office by phone, fax or email.

## CARRIAGE CHARGES

### UK Mainland Deliveries

Parcels up to 2kg will be sent 1st class post unless specified otherwise. Orders from 2kg to 40kg will be despatched on a guaranteed next-day delivery basis. Pallets will be delivered within 1-3 days from the date of despatch.

### Standard Charges

- 1st class postage charge £6.00 minimum.
- Next day carriage charge £12.00 minimum.
- Next day a.m. carriage charge £25.00 minimum.
- Carriage is charged on all orders of less than £500.00 nett goods invoice value.
- Orders in excess of £500.00 nett goods invoice value, consisting of more than one item, will be delivered free of charge. Exceptions will apply to very heavy items and consignments requiring a pallet.

#### IGE Carriage Charges

KG	Price	KG	Price
20	£12.00	31	£16.20
21	£12.40	32	£16.50
22	£12.80	33	£16.80
23	£13.20	34	£17.10
24	£13.60	35	£17.40
25	£14.00	36	£17.70
26	£14.40	37	£18.00
27	£14.80	38	£18.30
28	£15.20	39	£18.60
29	£15.60	40	£18.90
30	£15.90	0.30p per kg thereafter	

### Pallet Charges

- England & Wales £50.00 per pallet minimum.
- Scotland £55.00 per pallet minimum.
- Scottish Highlands – please contact us for a quote.

#### Pallet Charges

KG	Price
25 to 40	£50.00
41 to 150	£55.00
151 to 300	£72.00
301 to 500	£89.00

## General Technical Information

### Materials:

- ALU = aluminium
- ABS = acrylonitrile butadiene styrene
- CVS = chrome vanadium steel
- EPDM (EPT) = ethylene propylene diene monomer
- HPDE = high density polyethylene
- LDPE = light density polyethylene
- MDPE = medium density polyethylene
- M.S. = mild steel
- NBR = nitrile butadiene rubber
- PE = polyethylene
- POM = polyoxymethylene
- PP = polypropylene
- PPS = polyphenylene sulphide (better known as Ryton)
- PTFE = polytetrafluoroethylene (better known as Teflon)
- PU = polyurethane
- PVC = polyvinyl chloride
- PVDF = polyvinylidene fluoride
- SS = stainless steel

### General Terms:

- BP = burst pressure
- HP = high pressure
- WP = working pressure
- cSt = centistokes
- i/d = inside diameter
- o/d = outside diameter
- swg = standard wire gauge (i.e. the 'gauge' or thickness of a piece of steel)

### Thread Forms:

- BSF = British standard fine
- BSP = British standard pipe
- BSPF = British standard pipe – female thread
- BSPM = British standard pipe – male thread
- BSW = British standard Whitworth
- UNF = Unified fine thread



### High Volume Consignments (HVC)

All carriers now operate a pricing system based on the cubic mass of the consignment rather than the weight. This means, for instance, that, where a quantity of containers such as jerry cans is involved, the cube to weight ratio is disproportionately high and therefore extremely expensive on a cost-to-weight basis. Please contact us for a quote for the freight cost of any items in our brochure marked 'HVC' prior to placing an order. You may also wish to explore the possibility and cost of arranging your own collection.

### Offshore Deliveries

Please contact us for a quote for carriage to all offshore destinations.

### VAT

VAT is payable on all carriage charges.

Phone the Order Line  
**0161 303 7394**



# GENERAL INFORMATION & DATA

## TONNAGE CALCULATION CHART & HOLE PUNCH TECHNICAL DATA

### Tons of pressure required to punch mild steel.

This chart should be used to calculate the punching tonnage required for various applications, both manual and power assisted.

1. First select your hole diameter from the scale running horizontally across the top of the chart.
2. Then read down the scale on the left hand side of the chart to find your material thickness.
3. The figure shown in red at the intersection of these two figures is the tonnage requirement. (e.g. a 1/2" dia. hole through 3mm mild steel requires 4.7 tons of pressure).

		Hole Diameter																						
		inches	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"	1.1/2"	2"	2.1/2"	3"	3.1/2"	4"	
Material Thickness	gauge	inches	mm	0.4	0.5	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.6	2.8	4.2	5.6	7.0	8.5	9.9	11.3
	20	0.036	0.91	0.4	0.5	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.6	2.8	4.2	5.6	7.0	8.5	9.9	11.3
	18	0.048	1.22	0.5	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.4	2.6	2.8	3.1	3.3	3.5	3.8	5.5	7.5	9.4	11.3	13.0	15.0
	16	0.062	1.57	0.6	0.9	1.2	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	7.0	9.5	11.7	14.0	16.5	18.8
	14	0.075	1.90	0.7	1.1	1.5	1.8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	5.5	5.9	8.8	11.7	14.7	17.6	20.5	23.5
	12	0.105	2.67	1.0	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.1	5.7	6.2	6.7	7.2	7.7	8.2	12.3	16.4	20.5	24.5	28.8	32.8
	11	0.120	3.05	1.2	1.8	2.4	2.9	3.5	4.1	4.7	5.1	5.9	6.2	7.1	7.6	8.3	8.8	9.4	14.0	18.8	23.5	28.2	32.7	37.6
	10	0.135	3.43	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6	7.3	7.9	8.6	9.2	9.9	10.6	15.9	21.0	26.5	31.7	37.0	42.2
	3/16"	0.188	4.78	n/a	2.8	3.7	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	13.8	14.8	22.0	29.5	36.8	44.2	51.5	60.0
	1/4"	0.250	6.35	n/a	n/a	4.9	6.1	7.4	8.6	9.8	11.1	12.3	13.5	14.7	16.0	17.2	18.4	19.7	34.4	39.3	49.0	60.0	68.7	78.5
	5/16"	0.312	7.92	n/a	n/a	n/a	7.8	9.2	10.7	12.3	13.9	15.4	17.0	18.5	20.0	21.5	23.0	24.6	43.0	49.0	61.5	73.5	86.0	98.0
	3/8"	0.375	9.52	n/a	n/a	n/a	n/a	11.1	12.8	14.8	16.5	18.5	20.2	22.1	23.8	25.8	27.5	29.5	51.5	59.0	73.6	88.4	103.0	118.0
	1/2"	0.500	12.7	n/a	n/a	n/a	n/a	n/a	19.7	22.0	24.6	26.9	29.5	31.8	34.4	36.8	39.4	68.8	78.5	98.2	118.0	137.0	1.6	

### Selecting a Punch or Press

The following information, while not totally applicable to all manually operated tools included in this publication, is provided as a convenient general reference for metal punching operations up to and including large power presses.

### Hole Size x Material Thickness

Punching holes in metal is the fast, economical way to get precise hole size, smoothness and minimum burr. Compressive strength of the punch steel determines that the thickness of the metal being punched must not exceed the diameter of the punch. This relationship varies with the type of material. For example: the minimum hole diameter will be 1/4" in 1/4" mild steel, 1/4" in 3/16" stainless steel, and 1/4" in 5/16" aluminium.

### Maximum Rated Capacity

All punching tools have their maximum capacities for safe, dependable operation over a long time span. Tools listed in this brochure have a "rated capacity" based on their design strength. Before selecting a tool, use the following information and refer to our "Tonnage Calculation Chart" on page 83 to determine the specific tonnage required to punch the size and shape holes through the type and gauge of material being considered. These figures are for flat punch points - shear on the punches (see following section headed 'Shear Punches') will reduce the tonnage requirement.

### Determining Tonnages

**For Round Holes:** to determine tonnages for hot rolled mild steel (typically used in bar size angle iron, channels and tees) with a 50,000 psi shear strength, read direct from our "Tonnage Calculation Chart" above.

**Other Materials:** for materials other than mild steel select the proper multiplier from the chart below, and apply it to the tonnage required for mild steel shown in our "Tonnage Calculation Chart" above.

Metal Type	Multiplier
Aluminium (2024-0)	0.36
Brass (1/4 hard)	0.70
Copper (1/2 hard)	0.52
Steel (50% carbon)	1.60
Steel, cold drawn (1018)	1.24
Steel, ASTM-A36	1.20
Steel, stainless (303)	1.50
Example: 1" round hole thro' 26 ga. Aluminium (2024-0) $1.4 \times 0.36 = 0.5$ tons	

### Selecting a Punch or Press

For punching irregular shaped holes (square, rectangular, radius end, triangular, etc.) multiply the length of metal to be cut by the multiplier given for a 1" length in the chart below.

**Example:** The shear length, or total distance around, a 1" x 2" rectangular hole = 6". To punch such a hole in 20 gauge mild steel  $6" \times 1.01 = 6.06$  tons. For stainless steel this would be  $6" \times 1.50 = 9.0$  tons.

Metal Gauge	Mild Steel Multiplier	Stainless Steel Multiplier	Brass Multiplier
20	1.01	1.50	0.75
18	1.25	1.75	1.00
16	1.75	2.50	1.25
13	2.50	3.50	2.00
11	3.25	4.75	2.25
3/16"	4.25	7.00	3.25
1/4"	6.25	9.50	4.50
5/16"	8.00	12.00	5.50
3/8"	9.50	14.25	6.25
7/16"	11.00	15.50	7.75
1/2"	12.50	18.75	8.75
5/8"	15.75	23.50	11.00
3/4"	18.75	28.25	13.25
7/8"	22.00	33.00	15.50
1"	25.00	37.50	17.50

### Die Clearance

The relationship of the large die hole size to the punch size is die clearance and is stated as a percentage of the thickness of the material being punched. The range of clearances varies from 10% for thin materials to 20% for thicker materials. For 3/4" material the total die clearance is 0.150". Clearance should always be specified when there is any reason for doubt.

### Die clearance has the following effects:

#### too much clearance

1. extra roll-in at the top of the hole
2. too much burr at the bottom of the hole

#### too little clearance

1. more punching pressure needed - can reduce tool life
2. high stripping force causes part distortion and extra punch wear

#### correct clearance

1. straighter hole through material
2. minimum distortion at the top of the hole
3. minimum burr at the bottom of the hole

Effects of die clearance are more noticeable in thicker materials (such as 1/4") than in thinner materials (such as 16 gauge). If you are unsure as to what clearance you should allow for, please contact our technical sales office.

### Shear Punches

Shear may be added to almost any punch 1/2" or larger to reduce the shock load on machine components and the punch & die, and increase their life expectancy. Shear, in essence, proportions the force through part of the stroke length of the ram - much less material is being cut at any one time than would be a punch without shear. (There is no advantage in adding shear to a punch smaller than 1/2"). Shear is most effective when punching 14 gauge or lighter materials and can reduce the punching force by as much as 50%.

# FLUID COMPATIBILITY CHART

These recommendations are based upon information from material suppliers and careful examination of available published information and are believed to be accurate. However, since the resistance of metals, plastics and elastomers can be affected by concentration, temperature, presence of other chemicals and other factors, this information should be considered as a general guide only, rather than an unqualified guarantee. Ultimately the customer must determine the suitability of the pump used in various solutions. IGE offers this data sheet as an aid and a guide only and takes no responsibility for customers' pump selection based upon the information contained herein.

All recommendations assume ambient temperatures unless otherwise noted.

## RATINGS – CHEMICAL EFFECT

A – No effect – Acceptable

B – Minor effect – Acceptable

C – Moderate effect – Questionable

D – Severe effect – Not Recommended

1. P.V.C – Satisfactory to 72° F.

2. Polypropylene – Satisfactory to 72° F.

3. Polypropylene – Satisfactory to 120° F.

4. Buna-N – Satisfactory for "O" Rings.

5. Polyacetal – Satisfactory to 72° F.

6. Ceramag – Satisfactory to 72° F.

The ratings for these materials are based upon the chemical resistance only. Added consideration must be given to pump selections when the chemical is abrasive, viscous in nature, or has a Specific Gravity greater than 1.1

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyrolac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene	Rubber (Natural)	Epoxy	
Acetalehyde <sup>5</sup>	A	A	A	-	B	A	A	D	-	-	C	D	D	A	-	A	A	D	C	B	A	A	A	-	A	B	B	D	B	C	A	
Acetamide	-	B	A	-	-	-	-	-	-	-	C	-	-	-	-	B	-	-	-	-	-	-	-	A	-	A	A	-	A	D	A	
Acetate Solv. <sup>2</sup>	A	B	A	B	B	-	-	A	C	B	A	B	D	A	-	A	-	B	D	-	A	A	-	D	D	-	D	-	-	-	A	
Acetic Acid, Glacial <sup>1</sup>	-	B	A	A	B	A	A	C	C	D	A	C	B	A	C	D	D	D	B	B	A	A	A	-	D	D	B	C	B	C	B	
Acetic Acid 20%	-	-	A	-	-	A	A	-	C	-	-	B	-	A	A	-	D	-	-	A	A	-	A	-	D	C	-	C	-	-	B	
Acetic Acid 80%	-	-	A	-	-	A	A	-	C	-	-	D	-	A	B	-	D	-	-	B	-	-	-	A	-	D	C	-	D	-	-	B
Acetic Acid	-	B	A	B	B	A	A	C	C	D	C	A	B	A	A	D	D	C	B	A	A	A	A	-	C	C	-	C	B	C	A	
Acetic Anhydride	B	A	A	B	B	A	A	C	D	B	D	D	D	A	D	D	D	D	A	A	A	A	A	-	D	A	C	B	B	C	A	
Acetone <sup>3</sup>	A	A	A	B	A	A	A	A	A	A	A	D	D	A	D	B	A	D	C	B	A	A	A	A	D	D	B	C	A	D	B	
Acetyl Chloride	-	C	A	-	-	-	-	D	-	-	-	-	-	A	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	A	
Acetylene <sup>2</sup>	A	A	A	A	A	-	-	B	-	A	A	B	-	-	-	A	A	-	-	D	A	A	A	-	A	A	C	B	A	C	A	
Acrylonitrile	A	A	C	-	B	-	B	A	-	C	-	-	-	-	-	B	-	D	-	B	A	A	A	-	C	D	-	D	D	-	A	
Alcohols																																
Amyl	A	A	A	-	C	A	A	A	B	C	C	A	B	A	C	A	A	B	B	B	A	A	A	-	A	A	D	A	A	C	A	
Benzyl	-	A	A	-	B	A	A	A	C	-	-	D	B	-	A	A	A	D	D	A	-	A	A	-	A	D	-	B	B	D	A	
Butyl	A	A	A	-	B	B	A	B	C	C	C	A	B	A	A	A	A	-	B	B	A	A	A	-	A	A	D	A	A	A	A	
Diacetone <sup>2</sup>	-	A	A	-	A	A	A	A	C	-	A	D	-	-	A	A	A	-	-	D	-	A	A	-	D	D	-	D	A	D	A	
Ethyl (Ethanol)	-	A	A	A	B	A	A	A	C	A	A	A	C	-	A	B	A	B	B	A	-	A	A	A	A	A	B	A	B	A	A	
Hexyl	-	A	A	-	A	A	A	A	C	-	A	A	-	-	A	A	A	-	-	A	-	A	A	-	A	A	D	B	A	A	A	
Isobutyl	-	A	A	-	B	A	A	A	C	-	A	-	-	-	A	A	A	B	-	-	A	A	-	A	A	C	B	A	A	A	A	
Isopropyl	-	A	A	-	B	A	A	A	C	C	A	-	-	-	A	A	A	-	-	A	-	A	A	-	A	C	C	B	A	A	A	
Methyl <sup>4</sup> (Methanol)	-	A	A	A	B	A	A	A	C	A	A	B	-	A	A	C	A	D	B	A	-	A	A	A	C	B	-	A	A	A	A	
Octyl	-	A	A	-	A	A	A	A	C	-	A	-	-	-	A	A	A	-	-	-	-	-	-	A	B	-	B	A	C	A	A	
Propyl	-	A	A	-	A	A	A	A	-	-	A	A	-	-	A	A	A	-	-	A	-	A	A	-	A	A	B	A	A	A	A	
Aluminum Chloride 20%	-	D	C	D	B	A	A	D	-	D	A	A	B	-	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	A	-	
Aluminum Chloride	C	D	C	-	D	C	A	C	-	D	B	A	A	A	A	-	D	-	-	A	A	A	A	-	A	A	C	A	-	-	-	
Aluminum Fluoride	-	D	C	D	-	D	B	-	-	-	A	A	-	-	A	C	D	-	B	A	-	A	-	-	A	C	A	-	C	-		
Aluminum Hydroxide <sup>6</sup>	-	A	A	A	A	-	-	A	-	D	A	A	-	-	A	B	A	-	-	A	-	A	-	A	A	A	-	A	-	A	-	
Alum Potassium Sulfate (Alum), 10%	-	A	-	-	A	-	B	-	-	D	A	A	-	-	A	-	A	-	A	-	-	A	A	-	A	-	-	A	-	A	-	
Alum Potassium Sulfate (Alum), 100%	-	D	A	B	B	-	B	C	-	-	A	A	B	A	A	C	D	-	B	A	-	A	A	-	A	A	-	A	-	A	-	
Aluminum Sulfate	-	C	C	A	A	A	A	C	C	D	A	A	B	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	A	-	
Amines	A	A	A	-	A	B	A	B	-	A	B	C	A	A	B	D	A	-	-	-	-	-	A	A	-	D	C	B	B	C	-	
Ammonia 10%	-	-	A	-	-	A	A	-	-	-	-	A	-	-	A	A	-	A	-	-	A	A	-	A	-	A	D	-	A	-	-	
Ammonia, Anhydrous	A	B	A	A	B	B	A	D	-	D	B	A	B	A	A	D	A	-	B	A	B	C	A	-	D	B	B	A	A	D	-	
Ammonia, Liquids	-	A	A	A	D	-	B	D	-	A	A	A	B	A	A	D	-	-	D	A	-	A	A	-	D	B	B	A	A	D	-	
Ammonia, Nitrate	-	A	A	A	C	-	-	D	-	-	A	B	B	-	A	C	-	-	A	-	A	A	-	A	-	A	-	C	-	-	-	
Ammonium Bifluoride	-	C	A	-	D	-	B	-	-	-	-	A	-	-	A	D	-	-	-	-	-	-	A	-	A	-	A	-	-	-	-	
Ammonium Carbonate	B	A	A	A	C	A	B	B	-	C	B	A	B	A	A	D	A	-	-	A	-	A	A	-	B	D	C	A	A	-	-	
Ammonium Casenite	-	-	A	-	-	-	-	-	-	-	-	-	-	-	A	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ammonium Chloride	C	A	C	A	C	A	A	D	C	D	D	A	B	A	A	B	A	-	B	A	A	A	A	-	A	A	C	A	A	A	-	
Ammonium Hydroxide	A	A	A	C	A	A	D	D	A	C	A	B	A	A	D	A	B	B	A	A	A	A	A	-	B	B	B	A	A	C	-	
Ammonium Nitrate	A	A	A	A	B	A	A	D	D	A	D	A	B	A	A	C	D	-	B	A	A	A	A	-	A	A	C	A	A	A	-	
Ammonium Oxalate	-	A	A	A	-	-	A	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	A	-	A	-	A	-	-	-	-	
Ammonium Persulfate	-	A	A	A	C	A	A	A	-	D	A	A	-	-	A	A	D	D	-	-	A	-	A	A	-	C	A	-	A	A	-	
Ammonium Phosphate, Dibasic	B	A	A	A	B	A	A	C	-	-	D	A	-	-	A	A	B	A	-	B	A	-	A	-	A	A	B	A	A	A	-	
Ammonium Phosphate, Monobasic	-	A	A	A	B	A	A	D	-	-	A	A	A	A	B	A	-	-	B	A	-	A	A	-	A	A	B	A	A	A	-	
Ammonium Phosphate, Tribasic	B	A	A	A	B	A	A	C	-	C	D	A	-	-	A	A	B	A	-	B	A	-	A	A	-	A	A	B	A	A	-	
Ammonium Sulfate	C	A	B	A	B	A	A	B	C	C	C	A	D	A	A	B	D	-	B	A	A	A	A	-	D	A	B	A	A	A	-	
Ammonium Thio-Sulfate	-	-	A	-	-	A	-	-	-	D	A	-	-	-	B	-	-	-	-	-	-	-	-	-	A	-	A	-	-	-	-	
Amyl-Acetate	B	A	A	C	B	A	A	C	-	-	C	D	D	A	D	A	B	-	D	D	A	A	A	-	D	D	D	D	A	D	-	
Amyl Alcohol	-	A	A	-	B	A	A	A	-	-	A	D	A	C	A	A	-	B	A	-	A	A	-	B	B	D	A	A	C	-	-	
Amyl Chloride	-	C	B	-	D	-	A	A	-	-	A	D	C	A	D	A	C	-	D	D	-	A	A	-	A	D	D	D	D	-	-	

# GENERAL INFORMATION & DATA

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cycloc (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene	Rubber (Natural)	Epoxy		
Aniline	B	A	A	A	C	C	B	C	-	-	C	D	D	A	D	D	C	D	C	B	A	A	A	-	D	D	C	D	B	D	-		
Anti-Freeze	-	A	A	-	A	-	A	B	B	B	C	A	B	A	A	A	A	B	A	A	A	A	A	A	A	A	C	A	A	A	-		
Antimony Trichloride	-	D	D	-	D	-	A	-	-	-	-	A	A	A	-	D	-	A	-	-	-	-	A	-	-	-	-	C	-	A	-		
Aqua Regia (80% HCl, 20% HNO)	-	D	D	-	D	A	D	D	-	-	-	D	D	A	D	D	D	-	D	C	-	-	D	-	C	D	C	D	D	D	-		
Arochlor	-	-	-	-	-	-	-	-	-	-	A	-	-	-	D	-	-	-	-	-	-	-	A	-	-	A	D	-	D	B	D	-	
Aromatic Hydrocarbons	-	-	A	-	A	-	-	A	-	A	A	D	-	-	D	A	-	-	C	-	-	A	-	-	A	D	-	D	D	D	-		
Arsenic Acid	B	A	A	-	D	-	-	D	B	D	D	A	B	A	A	D	A	-	B	A	-	A	A	A	A	A	-	A	-	A	-	C	-
Asphalt	-	B	A	-	C	-	-	A	-	C	-	A	-	-	-	A	A	-	-	A	A	-	A	A	A	B	C	B	D	D	-		
Barium Carbonate	B	A	A	A	B	A	A	B	-	B	B	A	A	A	A	A	A	-	B	A	-	A	A	A	A	A	-	A	-	A	-	A	-
Barium Chloride	C	A	A	A	D	A	A	B	-	N	C	A	B	A	A	A	B	-	B	A	A	A	A	-	A	A	B	A	A	A	-	A	-
Barium Cyanide	-	-	A	-	-	-	-	C	-	-	A	-	-	-	B	-	-	-	B	-	-	A	-	A	C	-	A	-	A	-	A	-	
Barium Hydroxide	B	C	A	A	D	B	B	B	-	C	C	A	-	A	A	D	A	-	-	B	A	A	A	A	A	A	C	A	A	A	-	A	-
Barium Nitrate	-	A	A	-	-	A	-	D	-	A	A	B	-	-	A	A	-	-	-	-	-	-	A	A	-	A	A	-	A	-	A	-	
Barium Sulfate	B	A	A	A	D	A	A	C	-	C	C	A	-	A	A	A	A	-	B	A	A	A	B	-	A	A	D	A	A	-	-	-	
Barium Sulfide	B	A	A	-	D	-	-	C	-	C	C	A	A	A	A	-	B	A	-	B	A	-	A	A	A	C	A	A	A	-	-	-	
Beer <sup>2</sup>	A	A	A	-	A	A	A	B	D	D	A	-	A	A	A	B	D	B	B	D	-	A	A	-	A	D	C	A	A	A	-	-	
Beet Sugar Liquids	A	A	A	-	A	-	-	A	B	A	-	A	-	A	A	B	A	B	-	A	-	A	A	-	A	A	-	B	A	A	A	-	
Benzaldehyde <sup>3</sup>	A	A	A	-	B	A	A	A	-	B	A	D	D	A	D	A	C	D	D	D	A	A	A	-	D	D	B	D	A	D	A	-	
Benzene <sup>3</sup>	B	A	A	A	B	A	B	B	A	B	C	D	C	A	D	A	A	D	D	D	A	A	A	A	A	D	-	D	D	D	A	-	
Benzoic Acid <sup>2</sup>	B	A	A	A	B	A	A	B	-	D	-	A	B	A	A	B	D	-	B	D	-	A	B	-	A	D	-	D	D	D	A	-	
Benzol	-	A	A	-	B	A	A	B	A	-	-	D	-	A	D	A	A	-	-	A	-	A	A	A	A	D	D	-	D	-	-	A	-
Borax (Sodium Borate)	-	A	A	A	C	-	A	A	B	A	C	A	A	A	A	A	A	-	B	A	A	A	A	A	A	B	C	A	A	C	A	-	
Boric Acid	B	A	A	A	B	A	A	B	C	D	-	A	B	A	A	A	A	-	B	A	-	A	A	A	A	A	-	A	A	A	A	-	
Brewery Stop	-	-	A	-	-	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromine <sup>2</sup> (wet)	D	D	D	D	D	A	A	C	-	D	D	B	B	A	D	D	D	D	D	D	D	D	A	D	A	D	D	D	D	D	D	C	-
Butadiene	A	A	A	-	A	-	-	C	A	C	C	A	-	A	-	A	A	-	-	-	B	A	A	-	A	A	-	B	A	-	A	-	
Butane <sup>21</sup>	A	A	A	-	A	-	-	A	A	C	C	A	C	A	D	A	A	B	C	D	A	A	A	-	A	A	D	B	D	D	A	-	
Butanol	-	A	A	-	A	-	-	A	A	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Butter	-	B	A	-	A	-	-	D	-	D	-	-	B	-	B	A	-	B	-	-	-	-	-	-	A	A	-	B	A	D	A	-	
Buttermilk	A	A	A	A	A	-	-	D	-	D	-	-	B	A	A	A	A	B	-	-	-	-	A	A	-	A	A	-	A	-	D	A	-
Butylene	A	-	A	-	A	-	-	A	A	A	A	B	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Butyl Acetate <sup>1</sup>	-	-	C	-	A	-	-	A	A	-	-	A	D	D	A	D	A	-	-	C	D	A	A	A	-	D	B	D	D	B	D	A	-
Butyric Acid <sup>1</sup>	B	B	A	A	B	A	A	C	-	D	-	B	-	A	A	C	D	D	-	A	-	A	D	-	D	D	-	D	B	-	A	-	
Calcium Bisulfate	C	D	A	-	D	-	-	D	D	D	-	A	A	A	-	-	A	-	-	-	-	-	-	-	-	-	A	C	C	-	A	A	-
Calcium Bisulfide	-	-	B	-	C	A	A	C	-	-	-	A	-	A	A	C	A	-	B	A	-	A	A	-	A	A	-	A	D	-	A	-	
Calcium Bisulfite	-	D	A	-	C	A	A	C	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium Carbonate	B	A	A	A	C	A	A	C	-	D	-	A	A	A	A	A	A	-	B	A	-	A	A	-	A	A	-	A	-	A	A	-	
Calcium Chlorate	-	C	A	-	-	-	B	C	-	-	-	-	A	A	A	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium Chloride	C	A	D	C	C	A	A	B	-	C	-	A	A	A	A	D	A	B	B	A	A	A	B	A	A	B	D	A	A	A	-	-	
Calcium Hydroxide	B	A	A	-	C	A	A	B	-	-	-	A	A	A	A	B	A	-	B	A	-	A	A	A	A	A	C	A	A	A	-	-	
Calcium Hypochlorite	D	A	C	C	C	A	B	D	-	D	-	D	-	A	A	D	D	-	B	A	-	A	A	-	A	B	C	D	A	C	A	-	
Calcium Sulfate	B	A	A	A	B	A	B	B	-	-	-	A	A	A	A	A	C	B	A	A	A	A	-	A	A	-	D	-	C	A	-	-	
Calgon	-	A	A	-	-	-	-	C	-	D	-	-	-	A	B	-	-	-	-	A	-	A	A	-	A	A	-	A	-	-	-	-	
Cane Juice <sup>2</sup>	-	A	A	-	B	-	-	B	C	A	-	A	-	-	A	A	-	-	D	-	A	A	-	-	A	-	A	-	A	A	-	-	
Carbolic acid (See Phenol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbon Bisulfide <sup>2</sup>	B	A	A	A	A	-	-	C	-	B	-	D	D	-	A	A	-	-	D	-	A	A	A	A	D	-	D	D	D	A	-	-	
Carbon Dioxide (Wet)	-	A	A	-	C	-	-	A	C	C	C	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbon Disulfide <sup>2</sup>	-	B	A	-	C	-	-	C	C	B	C	D	C	A	D	A	A	-	D	D	A	A	B	-	A	D	-	D	D	D	A	-	
Carbon Monoxide	-	A	A	-	A	-	-	-	-	-	-	A	-	-	B	A	A	-	B	A	-	A	A	-	A	A	B	B	A	C	A	-	
Carbon Tetrachloride <sup>21</sup>	B	C	B	A	C	A	A	C	A	C	D	C	C	A	D	A	A	D	D	D	C	A	A	A	A	C	C	D	-	D	C	-	
Carbonated Water	B	A	A	A	A	-	-	B	-	D	-	A	-	-	A	A	A	-	-	A	-	A	A	-	A	A	-	A	-	A	-	-	
Carbonic Acid	B	A	B	A	A	-	-	A	B	-	D	-	A	-	A	A	A	-	B	A	-	A	A	-	A	B	B	A	A	A	-	-	
Catsup	-	A	A	A	D	-	-	C	-	D	-	A	-	-	A	B	A	B	-	A	-	A	A	-	A	A	-	C	-	-	-	-	
Chloroacetic Acid <sup>2</sup>	D	D	D	D	C	A	A	D	-	D	-	A	D	A	-	D	D	-	D	D	-	A	A	-	A	D	-	D	B	D	B	-	
Chloric Acid	-	D	D	-	-	-	-	-	-	-	-	D	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chlorinated Glue	-	A	A	-	D	-	-	C	-	D	-	-	-	-	C	-	C	D	-	-	-	-	-	-	-	A	C	-	D	B	D	A	-
Chlorine, Anhydrous Liquid	-	D	D	D	D	D	A	D	-	C	-	D	B	A	A	D	D	-	D	D	C	A	D	-	A	D	-	D	B	D	B	-	
Chlorine (Dry)	B	A	A	-	D	D	A	A	B	A	-	-	-	A	-	-	-	-	-	-	-	C	A	A	-	D	-	-	D	-	D	-	
Chlorine Water	D	-	D	-	D	A	B	D	D	D	-	A	-	A	C	-	D	-	D	C	A	D	-	A	D	C	D	-	-	-	-	-	
Chlorobenzene (Mono)	A	A	A	-	B	-	-	A	B	-	B	C	D	D	A	D	A	A	D	D	D	A	A	-	A	D	-	D	D	D	A	-	
Chloroform	A	A	A	A	D	A	A	B	-	D	C	D	C	A	D	A	C	D	D	D	C	A	A	A	A	D	D	D	D	D	A	-	-
Chlorosulfonic Acid <sup>1</sup>	D	D	-	D	D	A	B	D	-	-	D	C	C	A	D	D	D	-	D	D	D	-	C	-	D	D	D	D	D	D	C	-	
Chlorox (Bleach)	-	A	A	-	C	-	-	A	A	-	D	C	A	B	A	A	D	D	B	-	D	C	A	A	-	A	C	-	B	B	D	A	-
Chocolate Syrup	-	A	A	-	A	-	-	-	D	-	-	-	-	-	A	A	-	-	A	-	-	-	-	-	-	A	-	A	-	-	-	-	
Chromic Acid 5%	-	A	A	B	C	A	A	D	D	D	-	A	B	-	C	D	D	B	B	A	A	D	C	-	A	D	C	D	A	B	B	-	
Chromic Acid 10%	-	B	-	-	-	A	A	-	D	-	-	A	-	A	A	-	D	-	-	A	-	-	-	-	A	D	-	D	-	-	-	-	
Chromic Acid 30%	-	B	-	-	-	A	A	-	D	-	-	A	-	A	D	-	D	-	-	A	-	-	-	-	A	D	-	D	-	-	-	-	
Chromic Acid 50%	C	B	B	-	C	A	A	D	D	D	-	B	B	A	D	D	C	C	B	B	D	A	-	A	D	-	D	A	D	C	-	-	
Cider	-	A																															



# GENERAL INFORMATION & DATA

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VTON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene	Rubber (Natural)	Epoxy					
Hydrofluosilicic Acid	-	D	D	-	C	-	C	D	-	-	-	-	C	A	-	-	-	-	-	-	-	A	-	-	-	-	D	A	-	-	-					
Hydrogen Gas	A	A	A	-	A	-	A	-	B	B	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-					
Hydrogen Peroxide 10%	-	C	C	-	A	C	A	D	D	D	-	A	A	-	-	D	-	A	-	B	A	A	-	-	-	A	-	-	D	-	C	D				
Hydrogen Peroxide 30%	-	B	-	-	B	A	-	D	-	-	A	-	A	-	-	D	-	-	A	C	-	-	-	-	A	D	-	C	-	-	B					
Hydrogen Peroxide	-	A	B	A	A	B	A	D	D	D	D	A	C	A	B	D	D	-	B	A	C	-	A	A	A	D	C	D	C	C	A					
Hydrogen Sulfide, Aqueous Solution	-	A	A	C	C	A	A	D	C	D	-	A	B	A	A	D	D	-	B	A	A	A	A	A	B	C	-	B	A	D	A					
Hydrogen Sulfide (Dry)	A	C	A	-	D	-	A	D	C	B	B	A	-	A	-	-	-	D	-	-	-	A	-	A	-	A	-	-	-	-	A	A				
Hydroxyacetic acid (70%)	-	-	-	-	D	B	-	-	-	-	-	-	A	-	-	-	-	D	-	-	-	-	A	-	A	-	A	-	A	-	-	A				
Ink	A	A	A	-	C	-	-	C	-	D	D	-	-	-	B	A	A	-	B	-	-	-	A	A	A	A	A	-	A	-	-	-	A			
Iodine	-	D	D	D	D	A	B	D	-	D	-	D	B	A	A	C	D	D	D	D	-	D	A	-	A	B	-	D	B	D	A					
Iodine (In Alcohol)	-	-	B	-	-	D	A	-	-	-	-	D	-	A	C	-	D	-	B	-	-	-	A	-	A	D	-	D	-	-	-	-				
Iodoform	B	D	A	-	A	-	-	C	-	C	B	-	-	A	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-				
Isotane <sup>2</sup>	-	-	-	-	A	-	-	-	-	-	-	-	-	-	D	A	-	-	-	D	-	-	A	-	A	A	-	-	-	-	D	A				
Isopropyl Acetate	-	-	B	-	C	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	A	A	-	D	D	-	D	B	D	A				
Isopropyl Ether <sup>2</sup>	A	-	A	-	A	-	-	A	-	-	A	-	-	A	D	A	-	-	-	D	-	A	A	-	D	B	-	D	D	D	-					
Jet Fuel (JP3, JP4, JP5)	A	A	A	-	A	-	-	A	-	A	A	-	A	D	A	A	-	-	D	A	A	A	-	A	A	D	D	D	D	D	A	A				
Kerosene <sup>2</sup>	A	A	A	A	A	A	A	A	A	A	B	A	D	A	D	A	A	B	D	D	A	A	A	A	A	D	D	D	D	D	A	A				
Ketones	A	A	A	-	B	A	A	A	-	A	A	D	D	A	D	B	A	-	D	D	A	C	A	-	D	D	-	D	D	C	C	A				
Lacquers	A	A	A	-	A	-	-	A	C	C	C	-	D	-	C	A	A	-	-	A	-	A	A	-	D	D	-	D	-	D	A	A				
Lacquer Thinners	-	-	-	-	A	A	-	C	-	-	C	-	A	D	-	A	-	-	B	-	-	-	A	-	-	D	-	D	A	-	-	-				
Lactic Acid	A	A	B	C	C	A	A	D	-	D	A	B	A	A	B	C	-	B	A	A	A	A	-	B	B	-	A	B	A	A	A	A				
Lard	B	A	A	A	A	-	-	A	-	A	C	A	-	-	-	A	A	C	-	A	-	A	A	-	A	A	C	B	-	D	A	A				
Latex	-	A	A	-	A	-	-	A	-	-	-	-	-	-	A	A	A	-	B	-	-	-	A	-	A	A	-	C	A	-	-	A				
Lead Acetate	B	A	A	-	D	A	A	C	-	-	D	A	B	A	A	A	A	-	B	A	-	A	A	-	D	B	-	D	A	A	A	A				
Lead Sulfamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	A	B	C	A	D	C	A					
Ligroin <sup>3</sup>	-	-	A	-	-	-	-	A	-	-	-	-	-	-	D	A	-	-	-	D	-	-	A	-	A	A	-	B	A	D	A	A				
Lime	-	A	A	-	C	A	-	A	-	A	-	A	-	-	A	D	-	C	-	-	-	-	A	A	-	A	A	C	B	D	-	A				
Lubricants	-	A	A	-	A	A	A	B	-	-	-	A	-	A	-	A	A	B	-	A	A	A	-	A	A	C	D	-	D	A	-	-	A			
Magnesium Carbonate	-	A	A	A	-	B	-	-	-	-	-	A	-	-	A	-	-	-	B	A	-	-	A	-	A	-	A	A	-	-	-	-	A			
Magnesium Chloride	B	B	B	A	D	A	A	B	C	D	C	A	B	A	A	A	A	-	B	A	A	-	A	-	A	A	-	A	A	A	A	A				
Magnesium Hydroxide	A	A	A	-	D	A	A	C	B	B	B	A	-	A	A	A	A	-	B	A	A	A	A	-	A	B	-	B	-	C	A	A				
Magnesium Nitrate	-	A	A	A	-	A	A	-	-	-	-	A	-	A	A	A	A	-	B	A	-	-	A	-	A	A	-	A	-	-	-	-	A			
Magnesium Oxide	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	A	-	-	A	-	A	A	-	-	-	A			
Magnesium Sulfate	B	B	A	-	B	A	B	B	C	B	A	B	A	A	A	A	-	B	A	A	A	-	A	A	-	A	A	-	A	D	C	A	A			
Maleic Acid	C	A	A	A	B	A	A	C	-	-	B	A	B	A	A	C	A	-	-	C	-	-	A	A	-	A	D	-	D	D	A	A				
Maleic Anhydride	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	A	A	-	A	D	-	D	-	-	-	A			
Malic Acid	B	A	A	-	C	-	A	D	-	-	D	A	-	A	-	-	-	-	-	-	-	-	-	A	-	C	-	-	A	-	-	-	-			
Mash	-	A	A	-	-	-	-	A	-	-	-	-	-	-	A	A	-	-	-	-	-	-	A	-	-	A	-	-	-	-	-	-	-	A		
Mayonnaise	A	A	A	-	D	-	-	D	-	D	D	-	-	A	A	A	B	-	A	-	A	A	-	A	A	-	A	-	-	-	-	-	-	-		
Melamine	-	D	D	-	-	-	-	D	-	-	-	-	-	-	-	D	-	-	-	-	-	-	A	A	-	C	-	-	-	-	-	-	-	-		
Mercuric Chloride (Dilute Solution)	D	D	D	D	D	A	B	D	D	D	D	A	A	A	A	A	A	-	B	A	-	A	A	-	A	A	-	A	A	A	A	A	A			
Mercuric Cyanide	A	A	A	-	D	A	-	D	-	-	D	A	-	A	A	A	-	-	B	A	-	A	A	-	A	-	-	-	-	-	-	-	-	-		
Mercury	A	A	A	A	C	C	A	D	D	A	A	A	-	A	A	A	A	-	B	A	-	A	A	-	A	A	-	A	A	A	A	A	A			
Methanol (See Alcohol Methyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Methyl Acetate	A	-	A	-	A	-	A	A	-	-	B	-	-	A	-	A	-	D	-	-	-	-	A	A	-	D	D	D	B	B	D	-	-			
Methyl Acrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	A	A	-	D	D	-	B	B	D	A			
Methyl Acetone	A	-	A	-	A	-	-	A	-	A	A	-	-	A	D	A	-	-	-	-	-	-	-	A	-	D	D	-	D	-	-	-	-	-	C	
Methyl Alcohol 10%	A	-	A	-	C	-	A	C	-	-	B	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	A	
Methyl Bromide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	D	-	-	-	-	A	A	-	A	B	-	D	D	D	B	-	-	
Methyl Butyl Ketone	-	-	A	-	A	-	-	-	-	-	-	-	-	-	D	B	-	-	-	-	-	-	-	A	A	-	D	D	C	D	A	D	B	-	-	
Methyl Cellosolve	-	-	-	-	A	-	-	A	-	-	-	-	-	-	C	B	-	-	-	-	-	-	-	A	A	-	D	D	-	D	B	D	C	-	-	
Methyl Chloride	-	C	A	-	D	A	A	A	-	-	-	D	-	A	D	A	A	-	D	D	-	-	-	A	A	-	A	D	D	D	C	D	A	D	B	
Methyl Dichloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	D	A	-	-	-	-	-	-	A	A	-	A	D	-	D	D	D	A	A		
Methyl Ethyl Ketone	-	A	A	-	A	A	A	A	-	-	-	D	-	A	D	B	A	D	D	A	A	A	A	-	D	D	C	D	A	D	B	-	-	-	-	
Methyl Isobutyl Ketone <sup>2</sup>	-	-	A	-	-	A	A	-	-	-	-	D	-	A	D	B	A	D	-	C	A	A	A	-	D	D	C	D	C	D	B	-	-	-	-	
Methyl Isopropyl Ketone	-	-	A	-	-	-	-	-	-	-	-	-	-	-	D	B	A	-	-	-	-	-	-	A	-	D	D	B	D	B	D	B	-	-	-	
Methyl Methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	A	A	-	D	D	-	D	D	D	A	A	A	
Methylamine	A	-	A	-	A	-	-	D	-	B	B	-	-	-	B	D	-	-	-	-	-	-	-	A	A	-	B	-	-	-	-	-	-	-	-	-
Methylene Chloride	A	A	A	-	A	A	A	A	C	-	B	D	-	A	D	A	D	-	D	D	-	-	-	A	A	-	B	D	-	D	D	D	A	A	A	
Milk	A	A	A	A	A	-	-	C	C	D	D	A	-	-	A	A	A	B	B	A	-	-	-	A	A	A	A	B	A	A	A	A	A	A	A	
Molasses	A	A	A	A	A	-	-	A	B	A	A	A	-	-	B	A	A	-	B	A	-	-	-	A	A	A	A	-	A	-	-	-	-	-	-	-
Mustard	A	A	A	A	B	-	-	B	-	C	B	A	-	-	B	B	A	B	-	A	-	-	-	A	A	-	A	B	C	C	-	-	-	-	-	-
Naphtha	A	A	A	A	A	A	A	B	-	B	B	A	C	A	D	A	A	C	D	A	A	A	A	-	A	B	D	D	D	D	A	A	A	A	A	
Naphthalene	B	A	B	-	B	A	A	C	-	B	A	D	-	A	D	A	-	-	D	B	A	A	A	-	C	D	-	D	D	D	A	A	A	A	A	
Nickel Chloride	-	A	B	-	D	A	A	D	-	D	-	A	B	A	A	B	A	-	B	A	-	-	-	A	-	A	-	A	A	-	-	-	-	-	-	-
Nickel Sulfate	B	A	B	-	D	A	B	C	D	D	A	A	A	A	A	B	A	-	B	A	-	-	-	A	A	-	A	A	-	A	A	A	A	A	A	A
Nitric Acid (10% Solution)	A	A	A	A	D	A	A	D	-	D	D																									



	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VTON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene	Rubber (Natural)	Epoxy	
Bone	-	A	A	-	-	-	-	A	-	-	-	-	-	-	A	-	-	-	-	-	-	A	A	-	A	A	-	D	-	-	A	
Castor	-	A	A	-	A	-	-	A	-	A	-	A	-	-	A	-	-	-	-	-	-	-	A	A	A	A	A	-	A	B	A	A
Cinnamon	-	A	A	-	-	-	-	-	-	-	-	-	-	A	-	A	-	-	-	A	-	-	A	A	-	D	-	D	-	-	A	
Citric	-	A	A	-	-	-	-	D	-	D	-	-	-	-	A	A	-	-	A	-	A	-	A	A	-	A	-	D	-	-	A	
Clove	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	B	-	A	-	A	A	-	A	-	-	-	-	A	
Coconut	-	A	A	-	B	-	-	A	-	A	-	-	-	-	A	A	-	-	A	-	A	-	A	A	-	A	-	A	A	D	A	
Cod Liver	-	A	A	-	B	-	-	-	-	-	-	-	-	-	A	A	C	-	A	-	A	-	A	A	-	A	-	B	A	D	A	
Corn	-	A	A	A	B	-	-	B	-	A	-	-	-	-	A	A	C	-	A	-	A	-	A	A	-	A	-	D	C	D	A	
Cotton Seed	B	A	A	A	B	-	-	B	-	A	C	A	-	A	-	A	A	C	-	A	-	A	A	-	A	-	D	C	D	A		
Cresote2	-	A	A	-	A	-	-	-	-	-	-	-	-	-	D	-	-	-	D	-	A	-	A	A	-	A	-	B	D	D	A	
Diesel Fuel (2d, 3D, 4D, 5D)	-	A	A	-	A	-	-	A	-	-	-	-	-	-	D	A	A	-	-	A	-	A	A	-	A	-	D	D	D	A		
Fuel (1, 2, 3, 5A, 5B, 6)	-	A	A	-	A	A	A	-	-	-	-	A	-	A	D	A	-	-	-	B	-	A	A	-	A	B	-	D	D	D	A	
Ginger	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	A	A	-	A	-	A	-	-	A	
Hydraulic (See Hydraulic)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lemon	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	D	-	A	-	A	-	A	-	D	-	-	-	A	
Linseed	-	A	A	A	A	-	-	A	-	A	-	A	B	-	-	A	A	C	-	A	-	A	A	A	A	A	-	D	D	D	A	
Mineral	A	A	A	A	A	-	-	A	-	A	B	A	-	-	B	A	A	-	-	B	-	A	A	A	A	A	-	B	D	D	A	
Olive	A	A	A	-	A	-	-	B	-	A	B	A	-	A	-	A	A	-	-	A	-	A	A	-	A	A	C	B	-	D	A	
Orange	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	A	A	-	-	A	-	A	A	-	A	-	D	-	-	-	A	
Palm	-	A	A	-	A	-	-	B	-	-	-	A	-	-	A	A	-	-	-	-	-	-	A	A	-	A	-	D	-	-	A	
Peanut <sup>3</sup>	-	A	A	-	A	-	-	A	-	A	-	A	-	-	A	-	-	-	D	-	A	-	A	A	-	A	-	D	-	D	A	
Peppermint <sup>2</sup>	-	A	A	-	-	-	-	A	-	-	-	-	-	-	A	-	-	-	D	-	A	-	A	A	-	A	-	D	-	-	A	
Pine	A	A	A	-	A	-	-	D	-	C	B	A	-	A	-	A	-	-	-	-	-	-	A	A	-	A	-	D	-	D	A	
Rape Seed	-	A	A	-	-	-	-	A	-	-	-	A	-	-	A	-	-	-	-	-	-	-	A	A	-	A	B	-	D	-	D	A
Rosin	-	A	A	-	A	-	-	-	-	-	-	-	-	-	A	A	-	-	A	-	-	-	A	A	-	A	-	-	-	-	-	A
Sesame Seed	-	A	A	-	A	-	-	A	-	A	-	A	-	-	A	-	-	-	-	-	-	-	A	A	-	A	-	D	-	-	-	A
Silicone	-	A	A	-	-	-	-	A	-	A	-	-	-	-	A	A	A	-	-	A	-	-	A	A	A	A	-	A	-	-	-	A
Soybean	-	A	A	-	A	-	-	B	-	A	-	A	-	-	A	A	-	-	A	-	-	-	A	A	-	A	-	D	-	D	A	
Sperm	-	A	A	-	-	-	-	A	-	-	-	A	-	-	A	-	-	-	-	-	-	-	A	A	-	A	-	D	-	-	-	A
Tanning	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	A	A	-	A	-	D	-	-	-	A
Turbine	-	A	A	-	A	-	-	A	-	A	-	A	-	-	A	-	C	-	-	-	-	-	A	A	-	A	-	D	-	D	A	
Oleic Acid	B	A	A	B	B	-	B	B	C	C	C	A	C	A	C	B	A	B	D	C	-	A	A	-	B	B	D	D	D	D	A	
Oleum 25%	-	-	-	-	-	-	A	-	-	-	-	D	-	A	D	-	-	-	-	-	-	-	A	-	A	D	D	D	D	-	D	
Oleum	B	-	A	-	B	-	-	C	C	-	B	D	-	A	-	D	-	-	D	-	-	-	A	-	A	C	D	D	D	D	A	
Oxalic Acid (cold)	C	A	B	A	C	C	B	B	C	D	D	A	B	A	C	C	D	-	A	A	-	A	A	-	A	-	B	C	B	A	C	A
Paraffin	A	A	A	A	A	-	-	A	-	B	B	A	-	A	B	A	A	B	-	A	-	-	A	A	-	A	-	-	-	-	-	A
Pentane	A	C	C	-	A	-	B	A	-	B	B	-	-	A	D	A	A	D	-	-	-	-	A	A	-	A	-	B	D	D	A	
Perchloroethylene <sup>2</sup>	B	A	A	-	A	-	-	C	-	B	B	-	-	A	D	A	-	D	-	D	-	A	A	-	A	C	D	D	D	D	A	
Petrolatum	A	-	A	-	B	-	-	B	-	C	C	-	-	A	D	A	A	B	-	-	-	-	A	A	-	A	-	B	A	D	A	
Phenol 10%	B	A	A	-	A	-	B	C	-	B	D	A	C	A	-	-	D	-	-	-	-	A	-	-	B	D	-	C	D	C	C	
Phenol (Carbolic Acid)	B	A	A	A	B	C	A	B	D	D	D	A	C	A	C	D	D	-	D	B	-	A	A	D	A	D	-	D	D	D	B	
Phosphoric Acid (to 40% Solution)	-	B	A	A	D	A	D	D	D	-	A	B	A	A	D	D	C	B	A	A	B	C	D	A	D	-	D	B	C	A		
Phosphoric Acid (40% - 100% Solution)	-	C	B	B	D	B	A	D	D	D	-	A	B	A	A	D	D	D	C	A	A	B	D	D	A	D	-	D	B	C	C	
Phosphoric Acid (Crude)	-	D	C	C	D	C	A	D	D	D	D	-	-	A	-	D	D	D	C	-	A	C	D	-	A	D	-	D	B	-	A	
Phosphoric Anhydride (Dry or Moist)	-	A	A	-	-	-	-	D	-	-	D	D	A	-	-	-	-	-	-	-	-	-	A	-	-	D	D	-	D	-	A	
Phosphoric Anhydride (Molten)	-	A	A	-	D	-	-	D	D	-	D	-	-	A	-	-	A	-	D	-	-	-	-	-	D	C	-	D	-	D	A	
Photographic (Developer)	-	C	A	C	C	A	A	-	-	D	-	A	-	-	A	C	-	-	B	A	-	-	A	A	-	A	-	A	-	-	-	A
Phthalic Anhydride	B	A	B	-	B	-	A	B	-	C	C	-	-	A	-	-	A	-	-	-	-	-	-	-	-	A	C	-	-	-	-	
Picric Acid	B	A	A	-	C	-	A	D	D	D	D	A	A	A	-	-	A	-	A	-	-	-	-	-	-	A	A	D	A	-	A	A
Plating Solutions																																
Antimony Plating 130° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	A	-	A	D	A	-	-	B	
Arsenic Plating 110° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	D	A	-	-	B	
Brass Plating																																
Regular Brass Bath 100° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	D	A	-	-	B	
High Speed Brass Bath 110° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	D	-	A	A	D	A	-	-	B	
Bronze Plating																																
Copper-Cadmium Bronze Bath	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	D	A	-	-	B	
Copper-Tin Bronze Bath 160° F	-	-	A	-	-	A	A	-	-	-	D	-	A	A	-	A	-	-	A	-	-	-	D	-	A	A	D	B	-	-	C	
Copper-Zinc Bronze Bath 100° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	-	A	-	-	B	
Cadmium Plating																																
Cyanide Bath 90° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	-	A	-	-	B	
Fluoborate Bath 100° F	-	-	A	-	-	D	A	-	-	-	A	-	A	A	-	D	-	-	A	-	-	-	D	-	A	B	-	C	-	-	B	
Chromium Plating																																
Chromic-Sulfuric Bath 130° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Fluosilicate Bath 95° F	-	-	C	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	B	-	C	D	-	D	-	-	D	
Fluoride Bath 130° F	-	-	D	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	B	-	C	D	-	D	-	-	D	
Black Chrome Bath 115° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Barrel Chrome Bath 95° F	-	-	D	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Copper Plating (Cyanide)																																
Copper Strike Bath 120° F	-	-	-	-	A	A	A	-	-	-	-	-	A	A	-	-	-	-	-	-	-	-	C	-	B	-	-	A	-	-	-	
Rochelle salt Bath 150° F	-	-	A	-	-	A	A	-	-	-	D	-	A	A	-	A	-	-	A	-	-	-	D	-	A	A						







	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VTON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylter	Rubber (Natural)	Epoxy			
Sodium Hypochlorite <sup>3</sup> (to 20%)	-	C	C	C	C	A	A	D	D	D	-	A	B	A	A	D	A	-	B	D	C	D	A	B	A	C	D	D	B	C	B			
Sodium Hyposulfate	-	A	A	-	D	-	-	D	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	C	C			
Sodium Metaphosphate <sup>2</sup>	A	-	A	-	A	-	-	C	C	B	B	-	-	A	-	B	A	-	-	D	-	A	A	-	A	A	-	B	A	A	A			
Sodium Metasilicate	A	-	A	-	B	-	-	B	-	C	C	-	-	A	-	D	-	-	-	-	-	A	-	-	A	A	D	A	-	-	A			
Sodium Nitrate	B	A	A	A	A	A	B	B	C	A	B	A	B	A	A	B	A	-	B	A	-	A	A	A	B	C	D	B	A	C	A			
Sodium Perborate	B	-	C	-	B	-	-	C	C	B	B	-	-	A	A	B	A	-	-	A	-	A	A	-	A	B	D	B	A	C	A			
Sodium Peroxide	B	A	A	-	C	-	B	C	C	D	C	A	-	A	-	D	D	-	-	-	-	A	A	-	A	C	D	B	A	C	A			
Sodium Polyphosphate (Mono, Di, Tribasic)	-	A	A	-	D	A	A	C	-	-	-	-	-	A	A	B	-	-	-	-	-	A	A	-	A	A	-	D	A	A	A			
Sodium Silicate	B	A	B	A	C	A	B	C	B	C	-	B	A	B	A	A	C	A	-	-	A	-	A	-	A	A	-	A	A	A	A			
Sodium Sulfate	B	A	A	C	B	A	B	B	B	A	B	A	-	A	A	C	B	A	-	B	A	A	A	-	A	A	-	A	A	C	A			
Sodium Sulfide	B	A	B	-	D	A	B	D	D	A	B	A	B	A	A	B	A	-	B	A	A	A	A	-	A	C	-	A	A	C	A			
Sodium Sulfite	-	C	C	-	C	A	A	C	-	A	-	A	A	A	-	-	D	-	A	-	-	A	A	-	A	A	-	A	-	-	A			
Sodium Tetraborate	-	-	A	-	-	-	-	-	-	-	-	-	-	A	B	-	-	-	-	-	-	-	A	-	A	A	-	-	-	-	A			
Sodium Thiosulphate ("Hypo")	A	A	A	-	B	A	-	D	D	C	B	A	-	A	A	C	A	-	-	A	A	A	-	A	B	-	A	A	C	A				
Sorghum	-	A	A	-	-	-	-	-	A	-	-	-	-	-	A	A	-	-	-	-	-	A	A	-	A	A	-	A	-	-	A			
Soy Sauce	-	A	A	-	A	-	-	A	-	D	-	-	-	-	A	A	A	-	-	-	-	-	A	A	-	A	A	-	A	-	D	A		
Stannic Chloride	D	D	D	-	D	A	B	D	-	D	D	A	-	A	A	C	A	-	B	A	-	-	A	-	A	A	D	A	A	A	A			
Stannic Fluoborate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Stannous Chloride	D	D	C	-	D	A	A	D	-	D	D	A	A	A	-	-	D	-	A	-	-	-	-	-	-	B	C	D	D	-	A			
Starch	B	A	A	-	A	-	-	B	-	C	C	A	-	A	A	A	A	-	B	-	-	-	A	A	-	A	A	-	A	-	-	A		
Stearic Acid <sup>2</sup>	B	A	A	A	B	A	A	C	C	C	C	A	B	A	A	A	A	-	B	D	-	A	A	A	A	B	D	B	B	C	A			
Stoddard Solvent	A	A	A	A	A	A	A	A	B	B	A	D	A	D	A	A	B	D	D	A	A	-	A	-	A	B	D	D	D	D	A			
Styrene	A	A	A	-	A	-	-	A	-	-	A	-	-	-	A	A	A	-	-	-	-	-	-	-	-	B	D	D	D	D	A			
Sugar (Liquids)	A	A	A	A	A	-	A	A	-	B	B	-	-	A	A	A	A	B	-	A	-	A	A	A	A	A	-	B	-	-	A			
Sulfate Liquors	-	C	C	-	B	-	A	C	-	-	-	-	-	-	-	D	-	-	-	-	-	A	-	A	A	-	-	-	-	-	A			
Sulfur Chloride	-	D	D	D	D	-	-	C	D	-	-	A	C	A	A	D	A	-	A	D	-	A	C	-	A	D	-	D	D	D	C			
Sulfur Dioxide <sup>2</sup>	-	A	A	C	A	A	B	B	-	-	-	D	B	A	D	B	D	D	C	D	A	A	-	D	D	C	B	A	D	A				
Sulfur Dioxide (Dry)	A	A	A	-	A	-	A	A	C	A	B	D	-	A	-	-	A	-	D	-	-	-	A	A	-	A	-	-	-	-	D			
Sulfur Trioxide (Dry)	A	A	C	-	A	-	-	B	-	B	B	A	B	A	D	D	D	-	-	-	-	-	B	A	-	A	D	-	D	B	C	A		
Sulfuric Acid (to 10%)	-	D	C	C	C	A	A	D	D	D	-	A	B	A	A	D	D	B	B	A	A	A	-	A	C	-	D	D	C	A				
Sulfuric Acid (10%-75%) <sup>2</sup>	-	D	D	D	D	C	B	D	D	D	-	A	B	A	B	D	D	B	C	A	B	A	D	C	A	D	-	D	D	D	B			
Sulfuric Acid 75%-100%	-	-	D	-	D	B	-	D	-	-	-	B	-	A	A	-	D	-	-	-	B	C	-	A	-	A	D	-	-	-	D			
Sulfurous Acid	C	C	B	C	C	A	B	D	-	D	D	A	B	A	A	D	D	-	B	A	-	B	A	-	A	C	D	B	B	C	A			
Sulfuryl Chloride	-	-	-	-	-	-	-	-	-	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Syrup	-	A	A	A	A	-	-	D	-	-	-	A	-	-	A	A	A	B	-	A	-	A	A	A	A	-	B	-	-	-	A			
Tallow	-	A	A	-	A	-	-	-	-	-	-	-	-	-	A	A	A	-	C	-	-	-	A	A	-	A	A	-	-	-	-	A		
Tannic Acid	B	A	A	A	C	A	B	B	-	C	C	A	B	A	A	B	D	-	B	A	-	A	A	A	A	D	C	A	A	A	A			
Tanning Liquors	-	A	A	-	C	A	A	A	-	-	-	A	B	A	-	B	-	-	-	-	-	A	-	A	A	-	A	C	-	-	-	A		
Tartaric Acid	B	A	B	B	C	A	B	A	C	D	D	A	B	A	A	B	A	-	B	A	-	A	A	-	A	D	C	A	-	-	A			
Tetrachlorethane	-	-	A	-	-	A	A	-	-	-	-	D	-	A	D	A	A	-	-	-	-	-	A	-	A	D	-	-	-	-	D	A		
Tetrahydrofuran	-	A	A	-	D	-	-	D	-	D	A	D	-	A	D	A	A	-	D	C	A	A	-	B	D	-	D	B	D	D	A			
Toluene, Toluol <sup>3</sup>	A	A	A	-	A	A	A	A	A	A	A	D	D	A	D	A	A	D	D	D	A	A	A	A	C	D	D	D	D	D	A			
Tomato Juice	A	A	A	-	A	-	-	C	-	C	C	-	-	A	A	B	A	B	-	A	A	A	A	-	A	A	-	A	-	-	-	A		
Trichlorethane	-	C	A	-	C	A	A	C	-	C	-	-	-	A	D	A	-	-	-	-	-	-	A	-	A	D	D	D	D	D	A			
Trichlorethylene <sup>2</sup>	B	A	A	-	B	A	A	B	A	C	B	D	-	A	D	A	C	D	D	D	C	A	A	C	A	D	D	D	D	D	A			
Trichloropropane	-	-	A	-	-	-	-	A	-	-	-	-	-	-	D	A	-	D	-	-	-	-	A	A	-	A	A	-	-	-	-	A		
Tricresylphosphate	-	-	A	-	-	B	A	A	-	-	-	D	-	A	A	C	-	-	-	-	-	-	A	A	-	B	D	-	D	A	-	A		
Triethylamine	-	-	-	-	-	-	-	A	-	-	-	-	-	-	B	D	-	-	-	-	-	-	-	A	A	D	B	-	-	-	-	A		
Turpentine <sup>3</sup>	B	A	A	-	C	-	A	B	C	B	B	A	B	A	D	A	A	-	D	B	A	A	-	A	A	-	A	D	-	D	D	A		
Urine	-	A	A	-	B	-	-	C	-	B	-	A	-	-	A	A	A	-	B	A	-	A	A	-	A	A	-	D	A	-	-	A		
Vegetable Juice	-	A	A	-	A	-	-	C	-	D	-	-	-	-	A	A	A	-	-	-	-	-	A	A	-	A	A	B	D	-	-	A		
Vinegar	A	A	A	A	D	A	A	B	B	C	D	A	-	A	A	B	A	B	B	A	A	A	A	A	A	C	-	B	A	C	A			
Varnish (Use Viton for Aromatic)	A	A	A	A	A	-	-	A	B	-	C	-	-	A	D	A	A	-	-	-	-	-	A	A	A	A	B	C	D	-	-	A		
Water, Acid, Mine	-	A	A	-	C	-	-	C	D	C	-	A	B	-	A	D	A	B	-	A	B	A	A	-	A	A	-	B	-	-	-	A		
Water, Distilled, Lab Grade 7	-	A	A	-	B	-	-	A	-	D	-	A	B	A	A	A	A	A	-	A	A	A	A	A	A	A	-	B	A	A	A			
Water, Fresh	A	A	A	-	A	-	-	A	C	B	D	A	B	A	A	A	A	A	D	A	A	A	A	A	A	A	-	B	A	A	A			
Water, Salt	-	A	A	-	B	-	-	B	C	D	-	A	B	-	A	A	A	-	-	-	-	-	A	A	A	A	-	B	A	A	A			
Weed Killers	-	A	A	-	C	-	-	C	-	-	-	-	-	-	-	A	A	-	-	-	-	-	-	-	A	B	-	-	-	-	-	A		
Whey	-	A	A	-	B	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	A	A	-	A	-	-	-	-	-	A	
Whiskey and Wines	A	A	A	A	D	-	-	B	B	D	D	A	-	A	A	A	A	-	B	A	-	A	A	-	A	A	B	A	A	A	A			
White Liquors (Pulp Mill)	-	A	A	-	-	-	-	A	D	-	C	-	-	-	A	A	D	A	-	-	-	-	A	-	A	A	-	A	-	-	-	-	A	
White Water (Paper Mill)	-	A	A	-	-	-	-	A	-	-	-	-	-	-	B	A	-	-	-	-	-	-	-	A	-	A	-	-	-	-	-	-	-	A
Xylene <sup>2</sup>	A	A	A	-	A	-	-	A	A	A	B	D	-	A	D	A	A	D	D	D	A	A	A	A	A	D	D	D	D	D	D	A		
Zinc Chloride	D	A	B	B	D	A	B	D	D	D	D	A	-	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	A	A			
Zinc Hydrosulphite	-	-	A	-	D	-	-	D	-	D	-	-	-	-	A	C	-	-	-	-	-	-	-	-	A	A	-	A	-	-	-	-	A	
Zinc Sulfate	B	A	A	A	D	A	B	B	C	C	D	C	B	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	C	A			

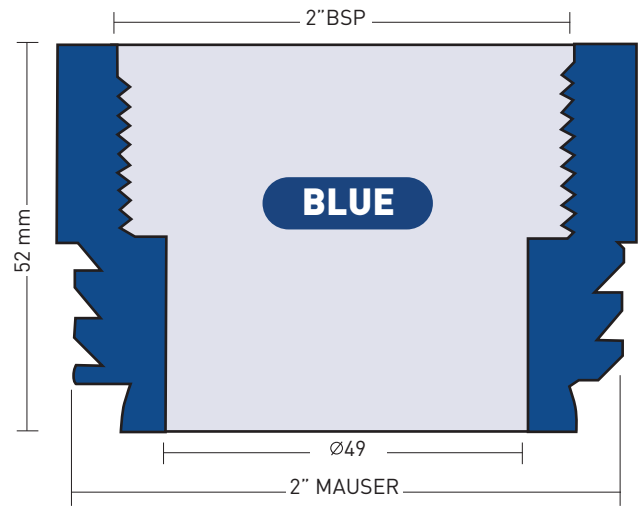
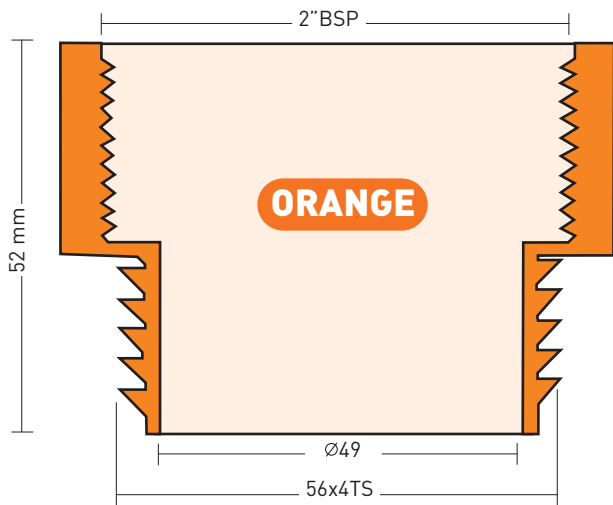
See page 45 for prices

Drawings to scale

## BARREL ADAPTORS

The following range of threaded plastic adaptors can be used where drums, with threads other than the standard 2 inch b.s.p., need to be converted to a 2 inch b.s.p. thread to facilitate the use of standard barrel pumps and taps.

**MODEL:** ADM  
**THREADS:** 70 x 6 Male to 2 inch BSP female  
**COLOUR:** Blue  
**APPLICATION:** Plastic drums with MAUSER buttress plugs, 70mm x 6  
**COMMON DRUM TYPES:** Mauser, Rexam, Harcostar, Wiva, Gallay, Dynoplast, Roug, Ostensjo

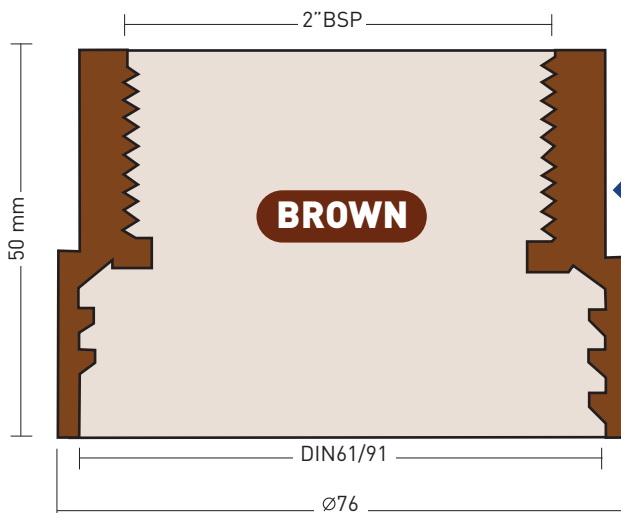
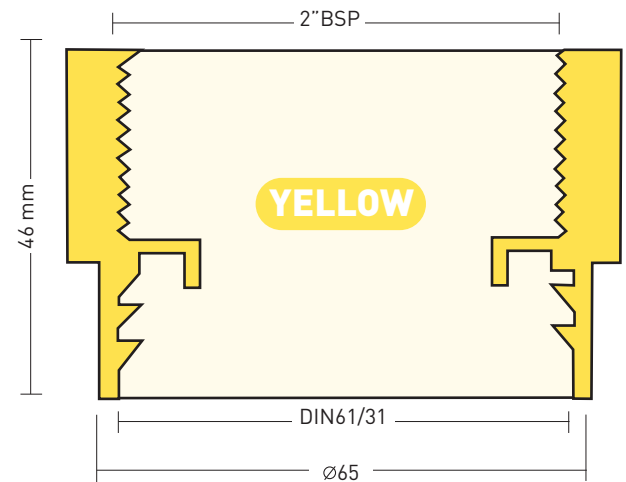


**MODEL:** ADTS  
**THREADS:** 56 x 4 Male to 2 inch BSP female  
**COLOUR:** Orange  
**APPLICATION:** Plastic drums with TRISURE-EURO buttress plugs, 56mm x 4, most plastic drums 20, 25, 50 & 60 litre

**COMMON DRUM TYPES:** Van Leer, Economic Drums, Gem Plastics, Dynoplast, Rexam Harcostar, Roug, Hannells, Sotralentz, Schutz

**MODEL:** ADDIN61  
**THREADS:** DIN 61 female to 2 inch BSP female  
**COLOUR:** Yellow  
**APPLICATION:** DIN 61 external screw necks on 'L' ring drums or IBC's, Plysu 20-25 litre drums with 59mm necks, Valerex 60mm necks, Dynoplast 25 litre drums with DIN 61 neck

**COMMON DRUM TYPES:** Van Leer (Valerex), Economic Drums, Gallay, Mauser, Schutz Drums & IBC's, Sotralentz IBC's, Van Leer Unicubes

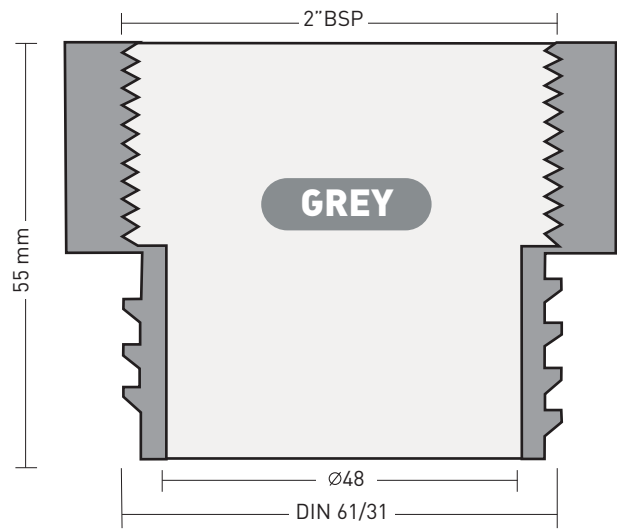
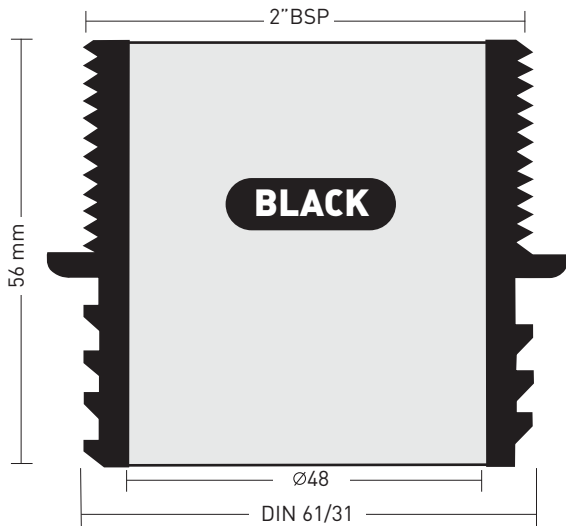


**MODEL:** ADDIN71  
**THREADS:** 70 x 6 Male to 2 inch BSP female  
 DIN 71 female to 2 inch BSP female

**COLOUR:** Brown  
**APPLICATION:** 'L' ring drums from Germany with large aperture necks

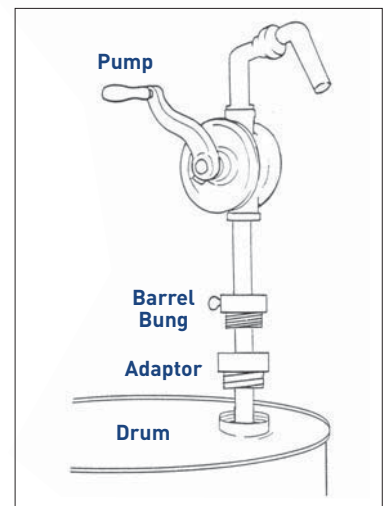
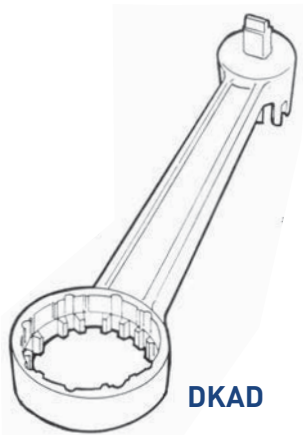
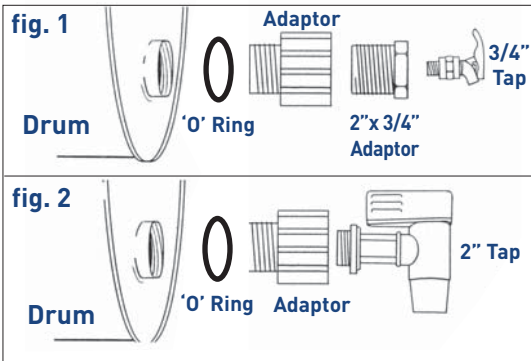
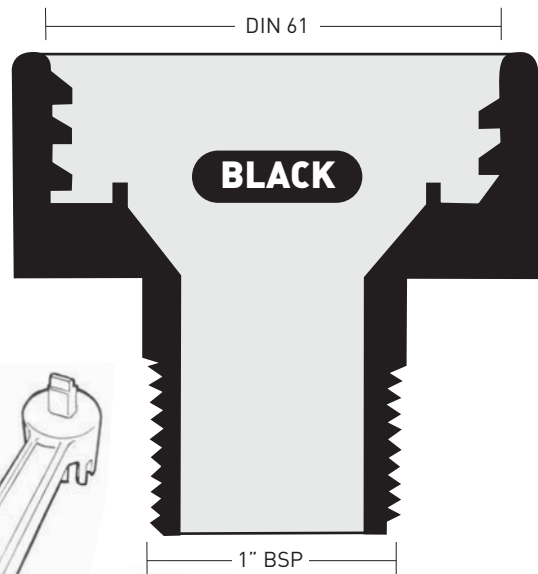
**COMMON DRUM TYPES:** Mauser and other German manufacturers

**MODEL:** ADUSIBC  
**THREADS:** DIN 61 male to 2 inch BSP female  
**COLOUR:** Grey  
**APPLICATION:** American IBC's  
**COMMON DRUM TYPES:** Hoover, Sonoco



**MODEL:** ADDIN2XM  
**THREADS:** DIN 61 male to 2 inch BSP male  
**COLOUR:** Black  
**APPLICATION:** Some American IBC's  
**COMMON DRUM TYPES:** Schutz and Finncont IBC's

**MODEL:** ADIBC  
**THREADS:** DIN 61 female to 1 inch BSP male  
**COLOUR:** Black  
**APPLICATION:** IBC's  
**COMMON DRUM TYPES:** Most IBC's



**ADDITIONAL ITEMS**

- 'O' ring for **ADM, ADTS, ADDIN61, ADDIN71** and **ADDIN2XM**. Required when drum is laid horizontally for use with a drum tap see fig. 1 & 2 - **Ref. ADOR**
- 2\"/>

See page 45 for prices

# GENERAL INFORMATION & DATA

## Pressure Conversion Chart – psi/bar/KPa

Use the table to convert pressure reading from either psi or Bar.

psi	Bar	KPa	Atm	Bar	psi	KPa	Atm
1	0.069	6.89	0.068	1	15	100	0.99
10	0.690	68.95	0.681	2	29	200	1.97
20	1.379	137.90	1.361	3	44	300	2.96
30	2.069	206.84	2.042	4	58	400	3.95
40	2.758	275.79	2.722	5	73	500	4.93
50	3.448	344.74	3.403	6	87	600	5.92
60	4.137	413.69	4.083	7	102	700	6.91
70	4.827	482.64	4.764	8	116	800	7.90
80	5.516	551.58	5.444	9	131	900	8.88
90	6.206	620.53	6.125	10	145	1000	9.87
100	6.895	689.48	6.805	15	218	1500	14.80
150	10.343	1034.22	10.208	20	290	2000	19.74
200	13.790	1378.96	13.610	25	363	2500	24.67
250	17.238	1723.70	17.013	30	435	3000	29.61
300	20.685	2068.44	20.415	35	508	3500	34.54
350	24.133	2413.18	23.818	40	580	4000	39.48
400	27.580	2757.92	27.220	45	653	4500	44.41
450	31.028	3102.66	30.623	50	725	5000	49.35
500	34.475	3447.40	34.025	100	1450	10000	98.69
550	37.923	3792.14	37.428	150	2175	15000	148.04
600	41.370	4136.88	40.830	200	2901	19999	197.39
650	44.818	4481.62	44.233	250	3626	24999	246.74
700	48.265	4826.36	47.635	300	4351	29999	296.08
750	51.713	5171.10	51.038	350	5076	34999	345.43
800	55.160	5515.84	54.440	400	5801	39999	394.78
850	58.608	5860.58	57.843	450	6526	44999	444.13
900	62.055	6205.32	61.245	500	7252	49999	493.47
950	65.503	6550.06	64.648	550	7977	54998	542.82
1000	68.950	6894.80	68.050	600	8702	59998	592.17
1100	75.845	7584.28	74.855	650	9427	64998	641.52
1200	82.740	8273.76	81.660	700	10152	69998	690.86
1300	89.635	8963.24	88.465	750	10877	74998	740.21
1400	96.530	9652.72	95.270	800	11603	79998	789.56
1500	103.425	10342.20	102.075	850	12328	84998	838.90
1600	110.320	11031.68	108.880	900	13053	89997	888.25
1700	117.215	11721.16	115.685	950	13778	94997	937.60
1800	124.110	12410.64	122.490	1000	14503	99997	986.95
1900	131.005	13100.12	129.295				
2000	137.900	13789.60	136.100				
2500	172.375	17237.00	170.125				
3000	206.850	20684.40	204.150				
3500	241.325	24131.80	238.175				
4000	275.800	27579.20	272.200				
4500	310.275	31026.60	306.225				
5000	344.750	34474.00	340.250				
5500	379.225	37921.40	374.275				
6000	413.700	41368.80	408.300				
6500	448.175	44816.20	442.325				
7000	482.650	48263.60	476.350				
7500	517.125	51711.00	510.375				
8000	551.600	55158.40	544.400				
8500	586.075	58605.80	578.425				
9000	620.550	62053.20	612.450				
9500	655.025	65500.60	646.475				
10000	689.500	68948.00	680.500				

### Conversion Factors

1 psi = 0.06895 bar

1 bar = 14.50326 psi

1 psi = 6.8948 KPa

MPa to KPa:

KPa = 1000 x MPa

KPa to MPa:

MPa = 0.001 x KPa

## Fluid Viscosity Characteristics Chart

Fluid Name	Temperature deg. C	Viscosity Centistokes	Density kg / litre	Fluid Name	Temperature deg. C	Viscosity Centistokes	Density kg / litre
Acetaldehyde	20	0.295	0.788	Machine oil - light	20	47	0.9
Acetic Acid	20	1.232	1.048	Machine oil - medium	20	850	0.94
Acetic acid anhydride	20	0.88	1.084	Mayonnaise	20	2	--
Acetone	20	0.41	0.79	Mercury	20	0.119	13.57
Allyl alcohol	20	1.603	0.852	Methyl acetate	20	0.44	0.959
Allyl alcohol	30	1.36	0.848	Methyl acetate	40	0.35	0.916
Allyl chloride	20	0.354	0.94	Methyl alcohol	0	1.04	0.81
Aluminum chloride [5% sol]	20	3.54	1.03	Methyl alcohol	10	0.855	0.801
Aluminum nitrate [10% sol]	20	4.54	1.051	Methyl alcohol	20	0.745	0.792
Aluminum sulphate [10% sol]	20	1.34	1.115	Methyl glycol	20	1.6	0.975
Amyl acetate	20	4.34	0.885	Methylene chloride	20	0.9	1.326
Aniline	10	6.4	1.03	Milk	20	1.13	1.035
Aniline	20	4.37	1.021	Molasses 80 Bx	20	10	--
Beer	20	1.8	0.996	Molasses 83 Bx	20	50	--
Benzene	20	0.744	0.879	Molasses 85 Bx	20	100	--
Benzene	30	0.65	0.868	Nitro benzine	20	1.67	1.203
Benzene	40	0.58	0.858	Nonane	0	1.35	0.733
Benzene	50	0.54	0.847	Nonane	10	1.15	0.725
Benzyl alcohol	20	5.52	1.045	Nonane	20	1	0.717
Bromine	20	0.34	3.12	Octane	0	1.05	0.719
Butyl acetate	20	0.832	0.885	Octane	10	0.935	0.711
Butyl alcohol	20	3.64	0.81	Octane	20	0.805	0.702
Butyl alcohol	30	2.85	0.803	Octane	40	0.64	0.685
Butyric acid n	0	2.35	0.977	Oil SAE 10W - 30	20	130	0.875
Butyric acid n	20	1.61	0.957	Oil SAE 10W	20	115	0.87
Calcium chloride [25% sol]	20	3.9	1.227	Oil SAE 20W - 20	20	200	0.885
Calcium chloride [5% sol]	20	1.161	1.037	Oil SAE 30	20	350	0.89
Carbolic acid	20	11.3	1.078	Oil SAE 40	20	900	0.9
Carbolic acid	30	9.7	1.069	Oil SAE 50	20	950	0.902
Carbolic acid	40	7.95	1.059	Olive oil	20	91.5	0.91
Carbon disulphide	0	0.33	1.292	Palm oil	20	130	--
Carbon disulphide	10	0.316	1.277	Paraffin oil	20	2.4	0.804
Carbon disulphide	20	0.298	1.262	Paraffin oil	30	1.85	0.78
Carbon tetrachloride	20	0.612	1.595	Pentane	0	0.44	0.646
Carbon tetrachloride	30	0.525	1.525	Pentane	10	0.39	0.636
Castor oil	20	1017	0.96	Pentane	20	0.36	0.626
Castor oil	40	315	0.95	Phenol	20	11.3	1.078
Castor oil	60	115	0.94	Phenol	40	7.95	1.059
Caustic soda 50%	20	45	--	Polyester resin	20	3	--
China wood oil	20	308	0.933	Polymer solution	20	20	--
Chloroform	20	0.38	1.489	Potassium hydroxide	20	67	--
Chloroform	40	0.37	1.452	Printing ink (and colours)	20	550-2,200	--
Chloroform	60	0.35	1.415	Propanol	20	2.8	0.804
Cod-liver oil	40	35	--	Propanol	40	1.7	0.786
Cotton seed oil	20	76	0.926	Propanol	50	1.4	0.777
Cream, 30-50% fat	20	11-115	--	Propionic acid	20	1.13	0.99
Cyclohexanol	20	71	0.952	Propylene glycol	20	54	1.038
Cyclohexanone	20	4.9	0.952	Rapeseed oil	20	178	0.92
Cylinder oil	20	50000	0.94	Sea Water	0	1.774	1.028
Dioxan	20	2	1.03	Sea Water	10	1.346	1.028
Ethyl acetate	20	0.51	0.905	Sea Water	20	1.044	1.025
Ethyl alcohol	20	1.51	0.772	Sea Water	40	0.659	1.019
Ethyl alcohol	40	1.16	0.737	Sea Water	60	0.442	1.01
Ethyl glycol	20	2.3	0.93	Sea Water	80	0.311	0.998
Ethylene glycol	20	18	1.112	Shampoo	20	3	--
Ethylene glycol	30	16.5	1.104	Sodium chloride [25% sol]	20	2.4	1.19
Formic acid	20	1.5	1.22	Sodium hydroxide [20% sol]	20	4	1.226
Formic acid	30	1.38	1.208	Sodium hydroxide [30% sol]	20	10	1.33
Fuel oil (E1) Extra light	20	6	0.85	Soya bean oil	20	75	0.926
Fuel oil (I) light	20	16.5	0.91	Styrene	20	0.9	0.926
Fuel oil (m) medium	20	520	0.99	Sulphuric acid	20	14.6	1.839
Fuel oil (s) heavy	20	8000	0.99	Tetrachlorethane	20	1.1	1.593
Furfural	20	1.45	1.16	Tetrachlorethylene	20	0.95	1.621
Gear oil	20	3000	0.905	Toluene	20	0.68	0.867
Gelatine	45	1.2	--	Toluene	40	0.55	0.849
Glycerine	20	1183	1.261	Toluene	60	0.46	0.831
Glycol	20	20	--	Tomato ketchup	30	1	--
Heptane	0	0.74	0.702	Transformer oil	20	30	0.95
Heptane	10	0.66	0.692	Trichlorethylene	20	0.96	1.463
Heptane	20	0.6	0.682	Water	0	1.788	1
Heptane	40	0.51	0.661	Water	10	1.307	1
Hexane	0	0.62	0.678	Water	20	1.002	0.998
Hexane	10	0.57	0.668	Water	40	0.662	0.992
Hexane	20	0.51	0.658	Water	60	0.475	0.983
Hexane	40	0.4	0.639	Water	80	0.365	0.972
Honey	40	2	--	Water	100	0.295	0.958
Kerosine	20	2.4	0.804	Xylene-o	20	0.93	0.864
Kerosine	30	1.85	0.78	Xylene-o	40	0.74	0.847
Linseed oil	20	47	0.92	Yogurt	40	150	--



Companies House

Centenary Certificate  
of  
**HARTLE IGE LTD.**

Registration Number: **00141725**

Incorporated on: **30th September 1915**

I hereby certify that the above company has today  
been registered at Companies House for 100 years.



**Tim Moss**

Chief Executive and Registrar of Companies  
for England and Wales

Companies House is an Executive Agency of the Department for Business, Innovation and Skills (BIS)