

TECHNICAL DATA

TECHNICAL DATA

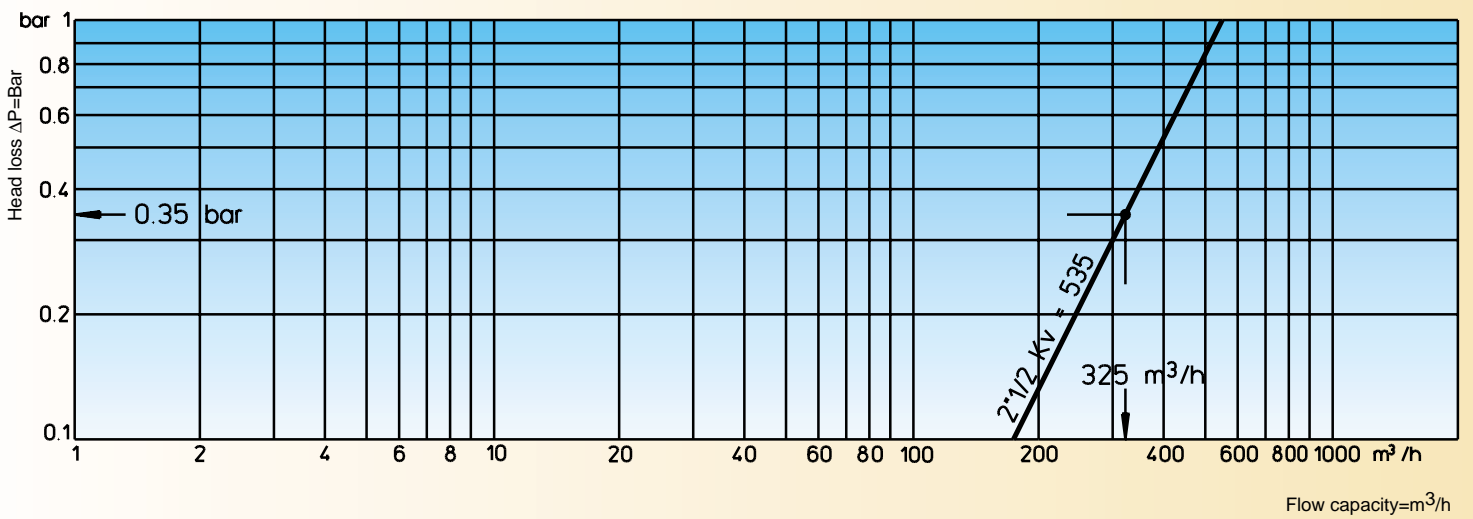
LOSS OF HEAD DIAGRAM

READING GUIDE

The curves of flow rate diagram have been drawn for every size of valve, according to laboratory tests.

The Kv value represents the loss of head expressed in cubic meters per hour of water at 15,5°C causing a loss of head of 1 bar (10,33 m of water gauge): the higher its value is, the lower are head losses.

For every other type of fluid and temperature level, the flow capacity changes accordingly: therefore to calculate it, it is necessary to introduce the relevant corrective coefficients into the formula.



EXAMPLE

The 2"1/2 valve above represented determines a loss of head of 0,35 bar at the flow rate of 325 m³/h.

Knowing the maximum loss of head allowed and the minimum necessary flow capacity, one chooses the size of the valve which gets as near as possible to the intersection point of the two half lines.

Knowing the flow rate of the installation, one can read the head loss corresponding to the chosen value and vice versa.

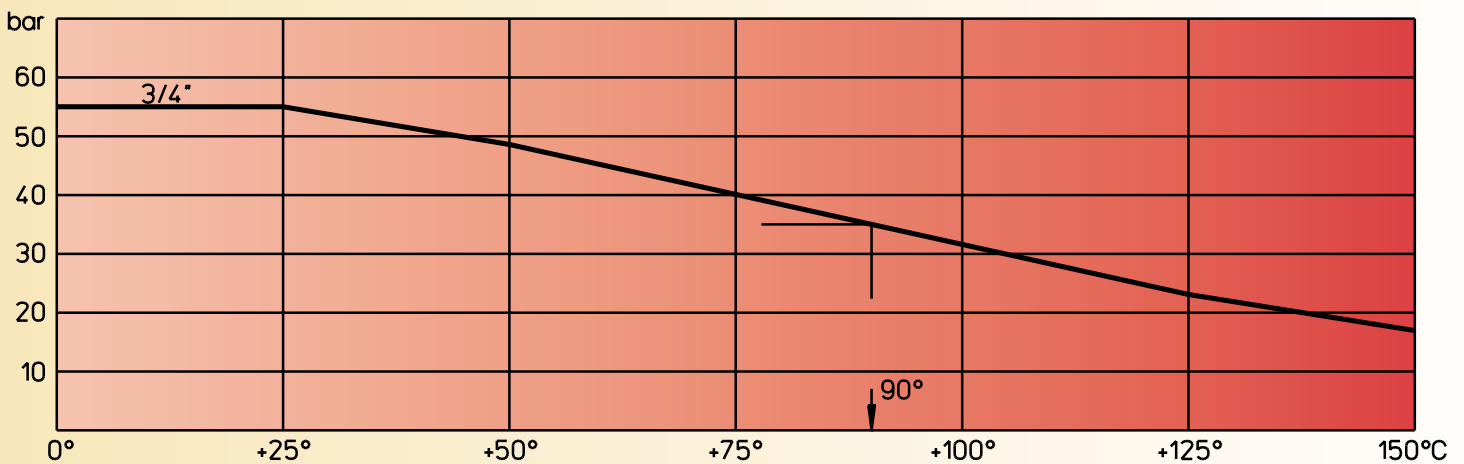
PRESSURE/TEMPERATURE DIAGRAM

READING GUIDE

The curves of pressure/temperature diagram have been drawn for every size of valve, on the ground of laboratory tests effected by using water. The values expressed in the curves represent the maximum working limits of the valves. Those values have

been achieved by slow variation of pressure/temperature parameters. So, the reported parameters are just indicative: the type of the fluid, changes of pressure, temperature and frequency of manoeuvre operations have a certain influence on valves' life.

Going beyond the temperature of 125°C and getting near to the limit values of the curve, the life of the valves is remarkably reduced.



EXAMPLE

The above curve shows that on 3/4" valves at a working pressure of 35 bar you must not exceed the temperature of 90°C.

NOTE

PN = Nominal Pressure.
PN is the maximum working pressure value at the temperature of 20°C.

INTERNATIONAL UNIT SYSTEM (SI)

CONVERSION FACTORS

In order to pass from the measure expressed in SI system to those expressed in the units of other systems, you have to multiply per K; inversely you have to multiply per 1/K.

Size	Unit System	Unit of other misurement systems						
		Technic	factors K	1/K	Anglo-Saxson	factors K	1/K	
length	m(metro)	m	1	1	in (inch)	39,370	0,0254	
area	m ²	m ²	1	1	ft (foot)	3,281	0,305	
					in ² (sq. in)	1550	0,000645	
volume	m ³ 10 ⁻³ m ³ = dm ³ = 1 (litro)	m ³ dm ³ = 1	1	1	ft ² (sq. ft)	10,764	0,0929	
					ft ³ (cu. ft)	35,315	0,0283	
					gal US (gallon)	0,264	3,785	
time	s (second)	s	1	1	sec (second)	1	1	
rotation speed	turn/s	turn/min	0,000278	3600	h (ora)	0,000278	3600	
					rpm(rev/min)	60	0,0167	
speed	m/s	m/s	1	1	fpm(ft/min)	196,85	0,0051	
frequency	Hz (hertz)	Hz (period/s)	1	1	Hz (cycle/sec)	1	1	
mass	kg(kilogram)				lb (pound)	2,205	0,454	
volumetric mass	g (gram)	kg/m ³	(**)		gr (grain)	15,432	0,0648	
					lb/ft ³	0,0624	16,018	
head capacity	kg/s	(**)						
force, weight(*)	N (newton)	kgf=kp (kg force)	0,102	9,807	lb (pound force)	0,225	4,448	
specific, weight	(**)	kgf/ m ³			lb/ft ³			
weight capacity	(**)	kgf/s			lbf/sec			
volum capacity	m ³ /s	m ³ /h	8600	0,000278	cfm (cu.ft/min)	2118,9	0,000472	
					l/h	1	1	gpm (gal/min)
force moment, torque (*)	N-m	kgf- m	0,102	9,807	lb-ft	0,738	1,356	
moment of inertia (MR ²) (*)	kg-m ²	kgf-s ² -m(****)	0,102	9,807	lb-ft ² (****)	23,73	0,0421	
pressure	Pa (pascal) = N/m ² 10 ⁵ Pa=bar	kgf/ m ² = mmH ₂ O kgf/cm ² = at(****) torr = mmHg	0,102	9,807	in wg(inch water gage)	0,00401	249,09	
			0,0000102	98070	psi (ibf/in ²)	0,000145	6895	
			0,0075	133,322	lbf/ft ²	0,0209	47,88	
stress	N-mm ² = MPa	kgf/ mm ²	0,102	9,807	psi (ibf/in ²)	145	0,0069	
material resistance (*)								
work , energy	j (joule)	kgf- m	0,102	9,807	lb-ft	0,738	1,356	
			Wh (Watt x hour)	0,000278	3600			
			kcal (calory)	0,000239	4186,7	BTU (British Thermal Unit)	0,000948	1055
mechanic power (*)	W (Watt)	HP (Horse power)	0,00136	735,5	BHP (Brake Horse Power)	0,00134	745,7	
electric power	W	W	1	1	W	1	1	
thermic power	W	kcal/h	0,86	1,163	BTU/hr	3,413	0,293	
temperature	k (kelvin) °C (celsius)	k (****) °C	1	1	°R (Rankine)	1,8	0,555	
			1	1	°F (fahrenheit)	(****)	(****)	
specific heat	J/kg k	kcal/kgf°C	0,000239	4186,7	BTU/lbf°F	0,000239	4186,7	
content of mass heat/heat power	J/kg	kcal/kgf	0,000239	4186,7	BTU/lbf°F	0,00043	2326	
total heat		kcal/kgf						
content of volumetric heat	J/m ³	kcal/m ³	0,000239	4186,7	BTU/ft ³	2,68E ⁻⁵	37260	
conductivity	W/m k	kcal/m h°C	0,86	1,163	BTU in/ft ² hr °F BTU/ft hr °F	6,933 0,5778	0,14423 1,7308	
thermic coefficient of trasmission	W/m ³ k	kcal/m ² h°C	0,86	1,163	BTU/ft ² hr °F	0,176	5,679	
specific thermal power	W/m ²	kcal/m ² h	0,86	1,163	BTU/ft ² hr	0,317	3,1546	
dynamics viscosity (*)	Pa s = N s/m ²	kgf s/m ² cP (centipoise)	0,102	9,807	lbf sec/ft ²	0,0209	47,88	
			1000	0,001				
kinematics viscosity	m ² /s	m ² /s cSt (centistoke)	1	1	ft ² /sec	10,764	0,0929	
			10 ⁶	10 ⁶				
gas constant	J/kg k	m /k	0,102	9,807	ft ² /R	0,602	1,661	

Multiples and submultiples of SI unities

Multiplication factor	10 ¹²	10 ⁹	10 ⁶	10 ³	10 ²	10 ¹	10 ⁻¹	10 ⁻²	10 ⁻³	10 ⁻⁶	10 ⁻⁹	10 ⁻¹²	10 ⁻¹⁵	10 ⁻¹⁸
Prefix	tera	giga	mega	kilo	etto	deca	deci	centi	milli	micro	nano	pico	femto	atto
Symbol	T	G	M	K	h	da	d	c	m	μ	n	p	f	a

Notes

(*) Conversion factors are valid only if acceleration of gravity has the value g = 9,807 (m/s²) equivalent to 32,17 (ft/sec²)

(**) Specific weight and weight capacity are not considered in SI system: their numeric values in technic system do correspond, respectively, to those of volumetric mass and mass capacity in SI system.

The volumetric mass of the air in standard conditions (t = 20°C; pa = 100.000 Pa) has the value of 1,20/Kg/m³, same as 0,075 lb/ft³ in Anglo-Saxon system.

(****) Technic system prefers dynamic moment PD2 (kgf•m²).

Moment of inertia in SI system results MR2 (Kg•M²) = PD2/4. Anglo-Saxon system uses the fly wheel effect WR2(lb•ft²) = 23,73 MR2

(*****) at = metric or technic atmosphere = 736 torr. - atm = normal or physical atmosphere = 760 torr.

(*****) t (°C) = T(K) - 273,15 t (°C) = 5/9 [t(°F) - 32] - t(°F) = 9/5 t(°C) + 32

CONVERSION TABLE

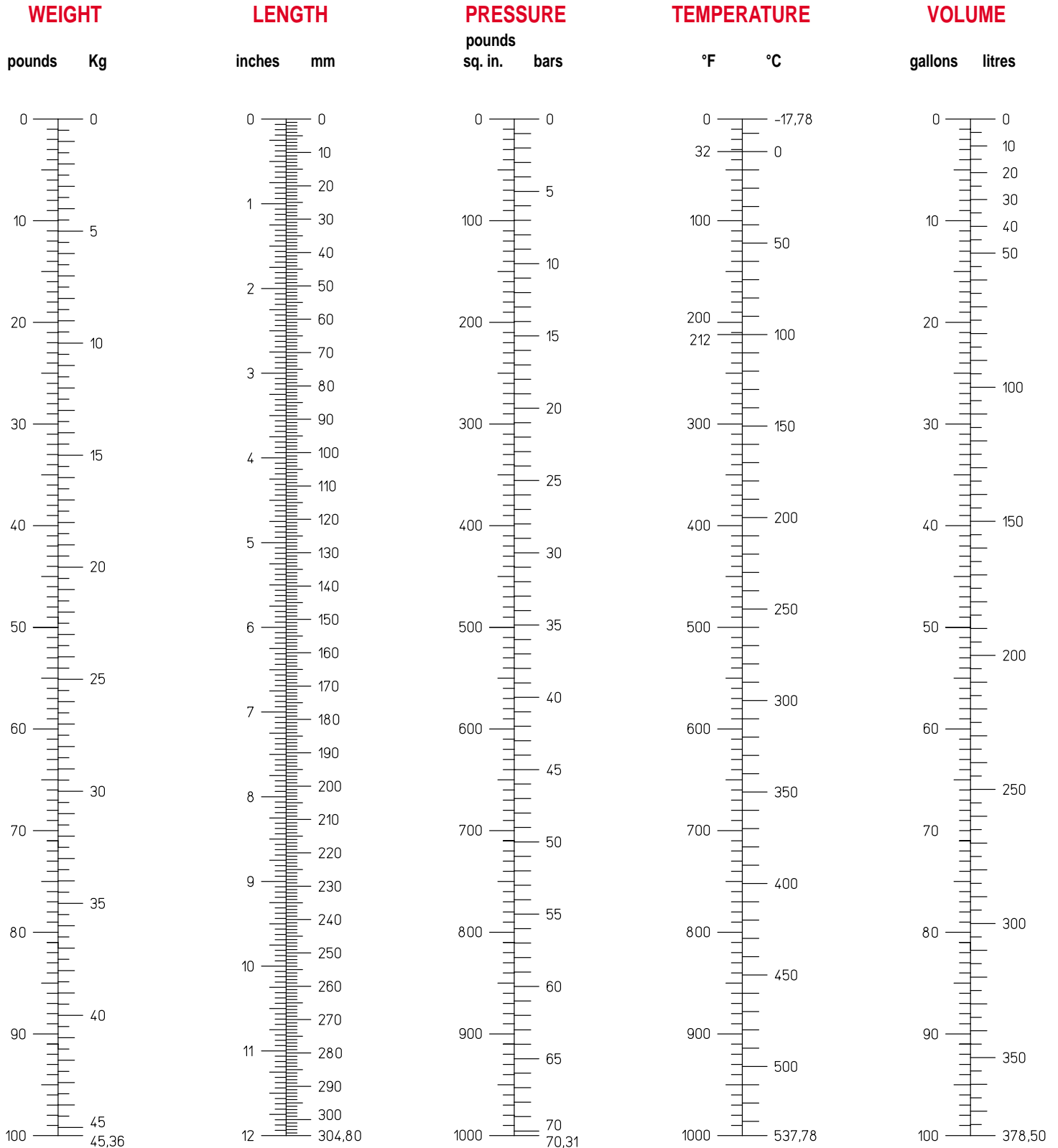


TABLE OF CHEMICAL RESISTANCE

E = EXCELLENT	G = GOOD	P = POOR	N = NOT RECOMMENDED	- = NO INFORMATION	BRASS	CR-ALLOY	P.T.F.E.	ACETALIC RESIN (copolymer)	FLUOROELASTOMER	BUNA-N (N.B.R.)	A 105 (carbon steel)	AISI 316 (stainless steel)	E = EXCELLENT	G = GOOD	P = POOR	N = NOT RECOMMENDED	- = NO INFORMATION	BRASS	CR-ALLOY	P.T.F.E.	ACETALIC RESIN (copolymer)	FLUOROELASTOMER	BUNA-N (N.B.R.)	A 105 (carbon steel)	AISI 316 (stainless steel)
Acetaldehyde	-	-	E	G	E	N	P	E	Carbon Tetrachloride (Wet)	P	G	E	E	E	N	N	P								
Acetic Acid	N	N	E	N	N	G	N	E	Carbonated Water	P	-	E	E	E	E	-	E								
Acetic Anhydride	P	N	E	N	N	G	P	G	Castor Oil	P	-	E	E	E	E	G	E								
Acetone	G	G	E	E	N	G	G	E	Caustics Soda	P	N	E	-	E	E	G	G								
Acetylene	P	G	E	E	E	G	E	E	Chlorine Gas (Dry)	N	G	E	E	E	E	-	P								
Alcohol-amyl	E	N	E	E	G	-	N	E	Chlorobenzene (Dry)	-	-	E	E	E	P	E	E								
Alcohol-butyl	E	G	E	E	E	E	G	E	Chloroform (Dry)	E	-	E	E	E	N	E	E								
Alumina	G	-	E	E	E	E	N	G	Chromic Acid	N	-	E	N	E	E	N	N								
Aluminium Chloride	N	-	E	E	E	E	N	P	Chromic Anhydride	N	-	E	-	-	E	N	N								
Aluminium Fluoride	-	-	N	-	-	E	N	P	Citric Acid	P	N	E	-	-	E	N	G								
Aluminium Sulphate	P	-	E	E	E	E	N	G	Coal Tar	G	G	E	E	E	P	E	E								
Amines	-	P	E	E	N	E	E	E	Coconut Oil	-	-	E	E	E	E	P	G								
Ammonia, Anhydrous	E	-	E	-	N	G	G	E	Copper Chloride	N	-	E	E	E	E	N	G								
Ammonia, Aqueous	N	N	E	-	N	G	G	E	Copper Nitrite	P	-	E	E	-	E	N	E								
Ammonium Bicarbonate	-	-	E	E	P	G	P	G	Copper Sulphate	N	N	E	E	E	E	N	G								
Ammonium Carbonate	-	-	E	E	P	E	G	G	Cottonseed Oil	E	G	E	E	P	E	P	G								
Ammonium Chloride	N	-	E	E	P	E	P	G	Creosote Oil	E	-	E	E	E	N	G	G								
Ammonium Hydroxide	N	N	E	E	P	E	G	E	Cresylic Acid	G	N	E	N	E	-	G	E								
Ammonium Monophosphate	-	N	E	G	P	E	N	E	Dichloroethan	-	-	E	-	-	P	N	G								
Ammonium Nitrate	N	-	E	E	P	E	G	G	Distilled Water	E	-	E	E	G	E	P	E								
Ammonium Phosphate	-	N	E	-	-	E	N	G	Ethyl Acetate	E	G	E	E	N	-	G	G								
Ammonium Phosphate (Dibasic)	-	N	E	-	P	E	E	E	Ethyl Alcohol	E	-	E	E	N	E	G	G								
Ammonium Phosphate (Tribasic)	-	-	E	-	P	E	G	E	Ethyl Chloride (Dry)	G	-	E	E	E	E	E	E								
Ammonium Sulphate	N	-	E	E	N	E	P	G	Ethylene Oxide	E	-	E	E	N	G	G	G								
Amyl Acetate	G	N	E	G	N	E	P	G	Ferric Chloride	N	N	E	E	E	E	N	N								
Aniline Conc.	P	N	E	E	P	P	G	G	Ferric Sulphate	N	N	E	E	E	E	N	E								
Arsenic Acid	-	-	E	E	E	-	N	G	Ferrous Chloride	N	-	E	E	E	E	N	N								
Asphalt Liquid	E	-	E	E	E	E	G	E	Ferrous Sulphate	N	N	E	E	E	E	P	G								
Barium Carbonate	E	G	E	E	E	N	G	G	Fish Oil	-	-	E	E	E	E	G	E								
Barium Chloride	N	-	E	E	E	E	P	G	Flax Oil	G	-	E	-	-	E	E	G								
Barium Hydroxide	G	N	E	E	E	E	P	G	Fluorosilic Acid	N	-	E	-	N	E	N	N								
Barium Sulphate	E	N	E	E	E	E	G	G	Formaldehyde	P	P	E	E	N	E	N	P								
Barium Sulphide	G	G	E	E	E	E	-	-	Formic Acid	N	N	E	N	-	E	N	P								
Beer	G	N	E	E	-	E	P	E	Freon	E	-	E	-	E	G	E	E								
Benzene	E	G	E	E	E	E	G	G	Fruit Juices	N	P	E	E	E	E	N	E								
Benzoic Acid	G	-	E	-	E	E	G	G	Fuel Oil	E	G	E	E	E	E	G	E								
Borax	E	N	E	E	E	-	G	E	Furfural	E	G	E	E	N	N	G	G								
Boric Acid	G	N	E	E	E	E	N	G	Gallic Acid	-	G	E	-	G	E	N	G								
Brines	G	G	E	-	-	E	P	G	Gas, Natural	E	-	E	E	E	E	G	E								
Bromine (Dry)	E	N	E	-	G	E	N	N	Gasoline	E	-	E	E	E	P	E	E								
Bromine (Wet)	N	-	E	-	G	N	N	N	Gelatine	G	G	E	E	E	E	N	E								
Bromine Acid	N	-	E	-	E	N	-	N	Glucose	E	G	E	E	E	E	G	G								
Butadiene	-	-	E	E	E	E	G	E	Glycerine	E	G	E	P	E	E	E	E								
Butane	E	-	E	E	E	E	G	G	Glucol Ethylene	G	-	E	-	E	G	E	E								
Butylene	-	G	E	-	E	E	E	E	Ground Water	G	-	E	E	P	E	P	E								
Butyric Acid	P	-	E	E	G	E	P	G	Hydrobromic Acid	N	-	E	-	-	E	N	N								
Calcium Bisulphate	G	-	E	-	E	E	N	G	Hydrocarbons	E	-	E	-	E	E	E	E								
Calcium Carbonate	E	-	E	E	E	E	G	G	Hydrochloric Acid	N	N	E	N	E	E	P	G								
Calcium Chloride	N	-	E	E	E	E	P	N	Hydrocyanic Acid	N	N	E	-	E	E	P	G								
Calcium Hydroxide	G	G	E	E	E	E	G	G	Hydrofluoric Acid	N	P	E	-	E	G	N	N								
Calcium Hypochlorite	N	G	E	E	E	E	N	N	Hydrogen Peroxide	P	N	E	-	G	E	-	E								
Calcium Sulphate	E	N	E	E	E	E	P	G	Hydrogen (Dry) Sulphide	E	P	E	-	N	-	-	-								
Carbolic Acid	G	G	E	N	E	E	P	G	Hydrogen (Wet) Sulphide	P	N	E	-	N	-	-	-								
Carbon Sulphate	E	N	E	-	-	E	G	G	Hydrofluosilic Acid	G	-	E	-	E	E	N	P								
Carbon Sulphide	G	-	E	E	E	N	G	G	Hypochlorate Sodium	P	-	E	-	-	P	N	P								

NOTE: The tables report the resistance of the materials to chemical corrosion. The data reported are obtained from tables given by the materials manu-

facturers and are indicative, not binding. To make sure concerning the practical suitability of materials, one has to consider various factors, such

as working conditions, pressure, temperature, time, fluid concentration and eventual dynamic shock.

	BRASS	CR-ALLOY	P.T.F.E.	ACETALIC RESIN (copolymer)	FLUROELASTOMER	BUNA-N (N.B.R.)	A 105 (carbon steel)	AISI 316 (stainless steel)		BRASS	CR-ALLOY	P.T.F.E.	ACETALIC RESIN (copolymer)	FLUROELASTOMER	BUNA-N (N.B.R.)	A 105 (carbon steel)	AISI 316 (stainless steel)
E = EXCELLENT									E = EXCELLENT								
G = GOOD									G = GOOD								
P = POOR									P = POOR								
N = NOT RECOMMENDED									N = NOT RECOMMENDED								
- = NO INFORMATION									- = NO INFORMATION								
Hypochlorite Sodium	N	-	E	-	-	E	N	P	Potassium Diphosphate	-	-	E	E	-	E	E	E
Hyposulphite Sodium	P	-	E	-	-	E	N	G	Potassium Disulphite	-	-	E	E	E	E	N	G
Iodoform	-	-	E	E	E	-	N	E	Potassium Hydroxide	P	N	E	-	-	E	E	E
Iso-octane	-	-	E	E	E	E	E	E	Potassium Iodide	-	-	E	E	-	E	P	G
Isopropilic Alcohol	-	-	E	E	E	E	G	G	Potassium Sulphate	G	G	E	E	E	E	G	G
Latic Acid	P	-	E	N	E	E	N	E	Propane	E	G	E	E	E	E	G	G
Lead Acetate	-	-	E	E	N	E	N	G	Pyrogallic Acid	-	N	E	E	E	-	G	G
Magnesium Chloride	N	G	E	E	E	E	N	G	Salicilic Acid	-	N	E	E	E	E	N	G
Magnesium Hydroxide	G	G	E	E	E	E	G	E	Sea Water	P	-	E	E	P	E	N	G
Magnesium Oxide	-	-	E	E	E	E	G	G	Silver Nitrate	N	-	E	E	E	E	N	G
Magnesium Sulphate	P	G	E	E	E	E	G	G	Soap Solution	G	G	E	-	-	E	G	G
Maleic Acid	-	N	E	E	E	E	G	G	Sodium Acetate	-	-	E	E	P	G	P	G
Malic Acid	-	-	E	E	E	E	N	G	Sodium Bicarbonate	P	G	E	E	E	E	P	G
Mercury Salts	N	-	E	-	-	E	-	N	Sodium Bisulfate	N	G	E	-	-	E	N	G
Mercury	N	N	E	E	E	E	G	P	Sodium Bisulfite	G	-	E	E	E	E	N	E
Methane	E	G	E	E	E	E	G	G	Sodium Borate	-	-	E	E	E	E	P	G
Methyl Acetate	-	-	E	-	N	N	G	E	Sodium Carbonate	P	P	E	E	E	E	G	G
Methyl Alcohol	E	-	E	E	N	E	G	G	Sodium Chloride	P	G	E	E	E	E	P	G
Methyl Chloride	G	-	E	-	-	P	N	G	Sodium Cyanide	N	N	E	E	P	E	G	G
Methyl Formate	-	-	E	-	N	P	P	G	Sodium Fluoride	-	-	N	E	E	-	N	G
Milk	G	P	E	E	E	E	N	E	Sodium Hydrate	G	-	E	-	-	E	E	E
Mineral Oil	E	-	E	E	E	E	G	E	Sodium Hydroxide	P	N	E	-	E	E	E	E
Mineral Water	G	-	E	E	P	E	P	G	Sodium Metasilicate	-	-	E	-	-	E	P	E
Molasses	G	N	E	-	E	E	-	E	Sodium Nitrate	P	-	E	E	P	E	G	G
Naphta	G	G	E	E	E	E	G	G	Sodium Perborate	-	N	E	E	E	E	G	G
Naphtalene	-	-	E	E	E	-	E	G	Sodium Phosphate	P	-	E	-	E	E	P	G
Nickel Chloride	P	-	E	E	E	E	N	G	Sodium Phosphate(Dibasic)	G	-	E	-	-	E	N	G
Nickel Nitrate	-	-	E	E	-	E	N	G	Sodium Silicate	G	-	E	E	E	E	G	G
Nickel Sulphate	P	G	E	E	E	E	N	G	Sodium Sulphate	G	G	E	E	E	E	G	G
Nitric Acid 0 To 50%	N	-	E	N	E	G	N	E	Sodium Sulphide	G	N	E	E	E	E	G	G
Nitric Acid 50 To 90%	N	-	E	N	E	N	N	G	Sodium Sulphite	G	-	E	E	E	E	G	G
Nitric Acid (Conc.)	N	-	E	N	E	N	N	G	Sodium Thiosulphate	P	N	E	E	E	E	G	E
Nitrobenzene	-	G	E	-	G	N	G	G	Soybean Oil	-	G	E	E	E	E	P	E
Nitrogen	E	G	E	E	E	E	E	E	Steam	P	-	E	N	P	-	E	E
Oleic Acid	P	N	E	E	G	G	P	G	Stearic Acid	P	G	E	E	P	E	P	E
Oleum	-	-	E	N	E	N	G	G	Styrene	-	-	E	-	G	G	E	E
Oxalic Acid	P	P	E	P	E	E	P	G	Sulphur Anhydride(Dry)	E	-	E	N	E	E	G	G
Oxygen	E	G	E	E	G	E	G	E	Sulphur Anhydride(Wet)	N	-	E	E	E	E	-	P
Paints	E	-	E	E	E	E	P	E	Sulphur	E	-	E	-	N	E	G	E
Paint Solvents	E	-	E	-	G	P	-	E	Sulphur Dioxide(Dry)	N	G	E	E	N	N	G	G
Palmitic Acid	P	N	E	E	E	G	P	G	Sulphuric Acid 0 To 10%	P	-	E	E	E	G	N	P
Paraffin	E	-	E	E	E	E	E	E	Sulphuric Acid 10 To 90%	N	N	E	P	E	N	N	P
Paraformaldehyde	-	-	E	E	-	G	G	G	Sulphuric Acid (Conc.)	N	-	E	N	E	P	G	G
Pentane	-	G	E	E	E	E	G	E	Sulphurous Acid	P	N	E	P	E	N	N	G
Phenol	-	P	E	N	E	G	P	G	Tannic Acid	G	P	E	E	E	E	N	E
Phosphoric Acid	N	-	E	N	E	G	N	N	Tartaric Acid	P	N	E	E	E	E	N	E
Phthalic Acid	-	N	E	E	E	P	P	G	Toluene Or Toluol	E	G	E	E	E	P	E	E
Picric Acid	N	-	E	-	E	N	P	G	Trichloroacetic Acid	P	-	E	-	-	-	N	N
Pine Oil	-	-	E	E	E	E	G	E	Trichloroethylene(Dry)	E	-	E	-	G	P	G	G
Potassium Bromide	-	-	E	E	E	E	G	G	Trichloroethylene(Wet)	P	-	E	-	G	P	-	-
Potassium Carbonate	P	G	E	E	E	E	G	G	Turpentine	G	G	E	E	E	N	E	E
Potassium Chlorate	-	-	E	E	-	E	G	G	Vinegar	N	P	E	-	E	E	N	E
Potassium Chloride	P	G	E	E	E	E	N	G	Xylene	-	-	E	-	-	N	G	E
Potassium Cyanide	N	N	E	E	E	E	G	G	Zinc Chloride	N	N	E	E	E	E	N	G
Potassium Dichromate	N	N	E	E	E	-	P	G	Zinc Sulphate	N	G	E	E	E	E	N	G

NOTE

The dimensions and weights reported in the tables and charts are indicative. The manufacturer retains the right to change specifications without prior notice, to ensure that the quality and technical standards are maintained at the highest level.

The measures are expressed in millimeters (mm) and the weights in grams (gr), unless otherwise specified.



CATALOGUE 2005

Published by:	ENOLGAS BONOMI S.p.A.
Compiled by:	Technical and Marketing dptm. ENOLGAS
Photocomposed by:	Desk Top Publishing dptm. ENOLGAS
Photographs by:	Photografic Studio Odeon - Brescia
Designed by:	Studio Line - Brescia
Artworks by:	Litoflash - Verona
Printed by:	Pagani - Brescia
Edition:	2005