

Propylene Glycol Industrial Grade

Technical Documentation.

Actualized September 2016

Carpemar



Carpemar

Typical values as 99,5% Propylene Glycol:

Appearance	Transparent Liquid	Visual
Boiling Point	188°C	ASTM D 1120
Freezing Point	< -50°C	ASTM D 1177
Density (20°C)	1,036 g/ml	ASTM D 1122
Viscosity (20°C)	52 mPas	ASTM D 445
pH mixed 50% v/v with distilled water	6,5-7,5	ASTM D 1287
Water content	max. 0,05%	ASTM D 1123
Cubic Expansion Coefficient	0,00062 1/K	
Alkaline Reserve	0 ml HCl 0,1N	ASTM D 1121

Material Compatibility with 99.5% Propylene Glycol:

Selection of the proper material of installations including gaskets and elastomers is important in designing installation for proper working and preventing spills to the environment.

Material compatibility information, appearing in the following table was obtained from proprietary tests and published literature. Conditions of exposure and the presence of other chemicals and trace impurities should always be considered when choosing a construction material.

Glycols are likely to leak past improperly assembled or defective fittings, seals and block valves.

Material	Maximum operation Temperature	
	(°F)	(°C)
ABS	80	26,7
CPVC	50	10,0
Epoxy	200	93,3
Fluorocarbons FEP	400	204,4
Fluorocarbons TFE	470	243,3
Furfuryl Alcohol	250	121,1
Chlorinated Polyesters	100	37,8
Polyethylene	140	60,0
Polypropylene	140	60,0
Vinyl Ester	210	98,9
Viton A	90	32,2
Neoprene GR-M (CR)	80	26,7
Nitrile Bruna N (NBR)	80	26,7



In the following tables additional general guidance for corrosion resistance is shown for various metals and plastics for pure 99.5% Propylene Glycol.

Material	Temperature (°F)	Temperature (°C)	Rating
Aluminium	60-170	15,6 - 76,7	2
Brass	60-90	15,6 - 32,2	3
Bronze	60-210	15,6 - 98,9	3
Carbon Steel	60-210	15,6 - 98,9	2
Copper	60-90	15,6 - 32,2	3
Hastelloy B	60-90	15,6 - 32,2	2
Inconel	60-90	15,6 - 32,2	3
Monel	60-90	15,6 - 32,2	3
Nickel	60-90	15,6 - 32,2	3
304 SS	60-90	15,6 - 32,2	2
316 SS	60-210	15,6 - 98,9	2
Titanium	60-90	15,6 - 32,2	1

Rating Code:
 1 ≤ 2 mils/year
 2 ≤ 20 mils/year
 3 ≤ 20 mils/year NOT recommended

Zinc is not compatible with propylene glycol or their mixtures with water, avoid zinc or galvanized reservoirs.

Corrosion Table for Propylene Glycol – Water Mixtures:

Mixtures of propylene glycol and water are more corrosive than pure water so additives should be used in order to ensure the integrity of the circuit.

The following table shows the corrosion values of mixtures Propylene Glycol – Water according to ASTM D 1384. For a comparative purpose results for water alone are presented.

Material	Propilenglicol (50% v/v)	Water
Steel	-225	-76
Aluminium	-68	-32
Cooper	-1,2	-1,0
Cast Iron	-92	-192
Brass	-2,5	-1,0
Solder	-136	-11

The results above are an average change in weight of coupons in g/m². A positive number indicates an increase in weight due to the formation of a stable protective layer on the metal's surface.

Compatibility table for Propylene Glycol–Water Mixtures:

The next table shows plastics, sealants and elastomers compatible with water dilutions of propylene glycol. Data has been gathered in specific bibliography and proprietary tests.

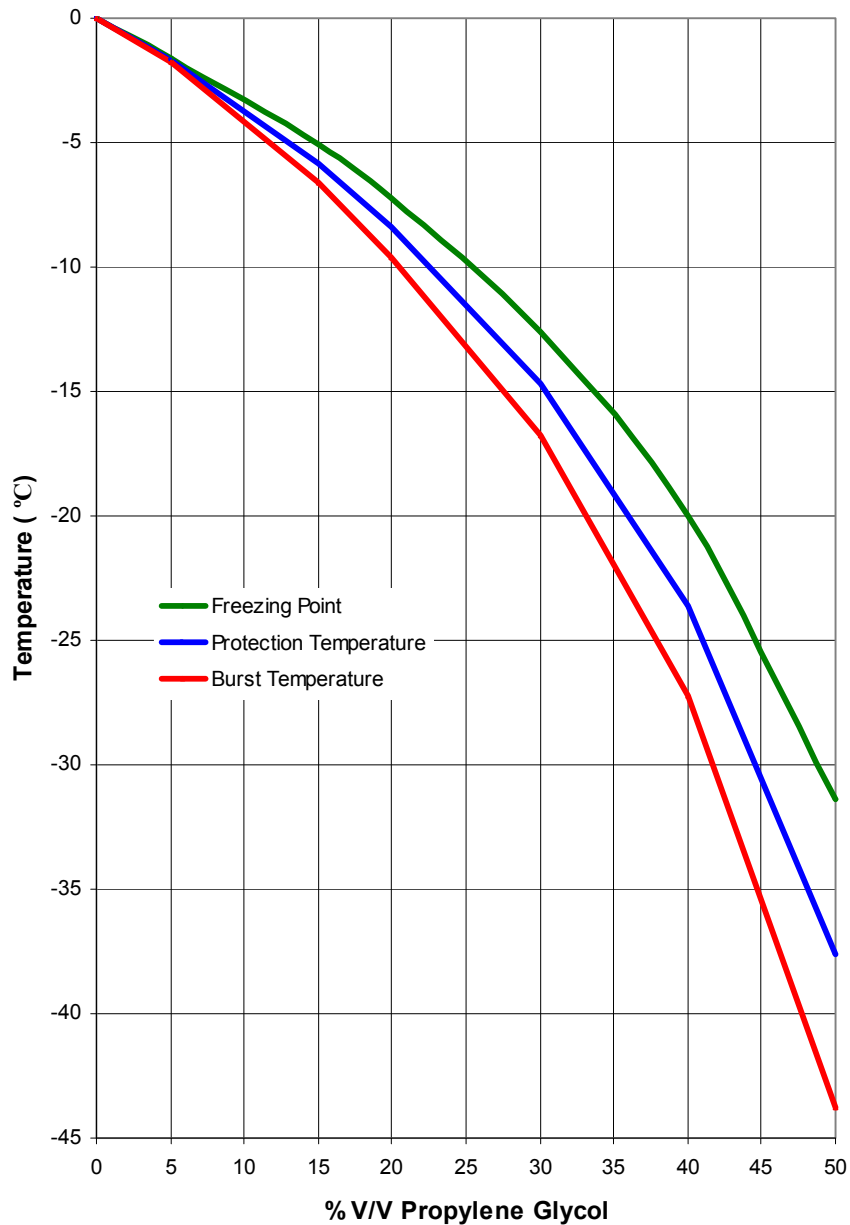
Name	Abbreviation
Butyl rubber	IIR
Cloropropene	CR
Ethylene-propylene-diene rubber	EPDM
Fluorocarbon elastomers	FPM
Natural rubber up to 80°C	NR
Nitrile Rubber	NBR
Polyacetal	POM
Polyamide up to 115°C	PA
Polybutene	PB
Polyethylene high/low density	PE-LD/PE-HD
Polyethylene cross linked	VPE
Polypropylene	PP
Poly (tetrafluoroethylene)	PTFE
Polyvinyl chloride, rigid	PVC h
Silicone Rubber	Si
Styrene-butadiene rubber up to 100°C	SBR
Unsaturated polyester resins	UP

Presentation:

Propylene glycol is supplied in 1.000 liters. IBC containers, 210 liters non-returnable plastic drums, and in 25 and 10 liters non-returnable plastics drums.

Other volumes are available upon request.

Frost Protection .vs. %V/V Propylene Glycol



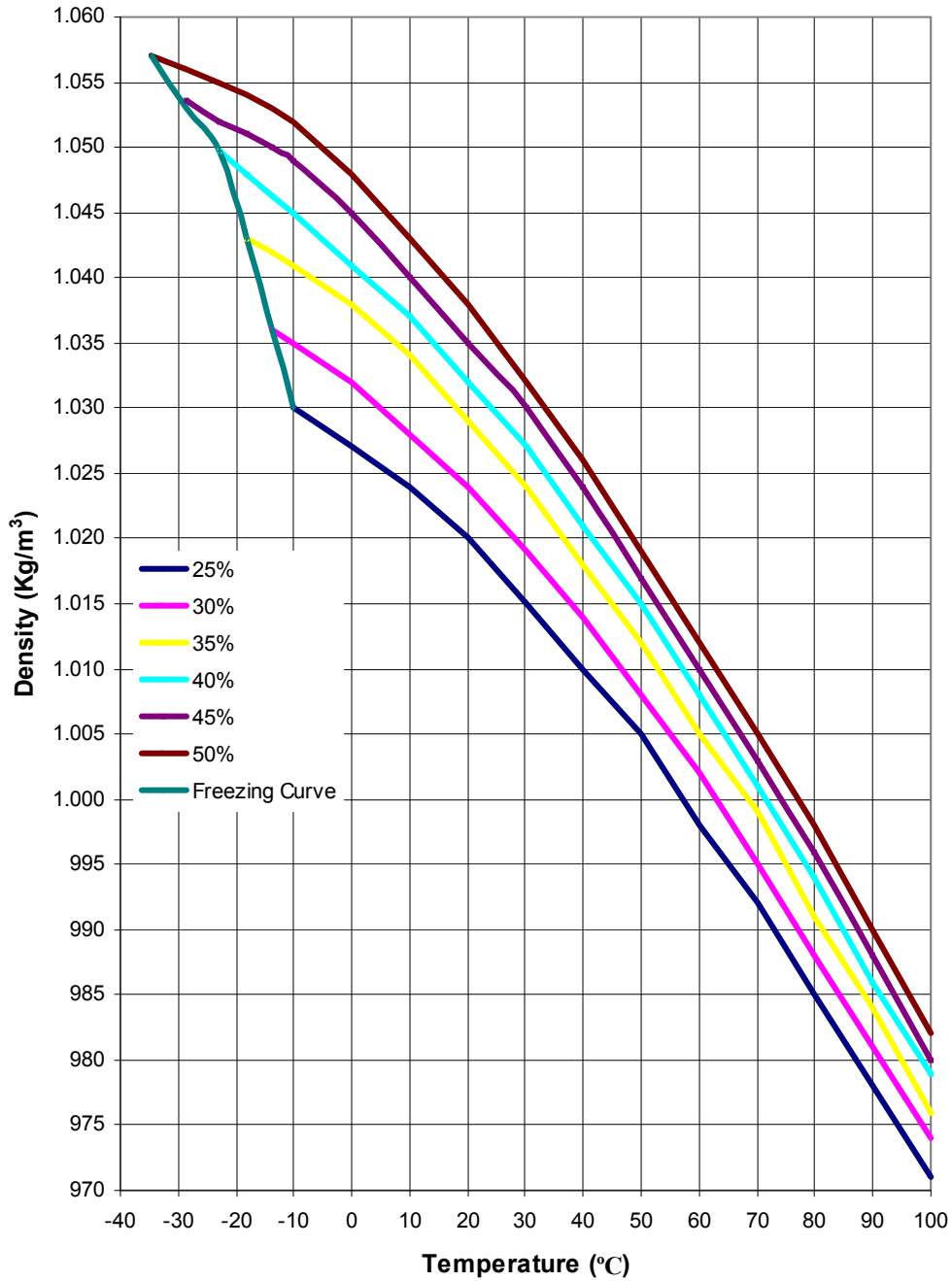
Freezing point according to ASTM D 1177 is the temperature for the first ice crystal formation.

DIN 51583 normative establishes the temperature from the product does not flow and there is danger for the circuit integrity.

Between both temperatures exists a mixture of ice crystals and not-frozen fluid that flows without volume increase, thus, without bursting problems.

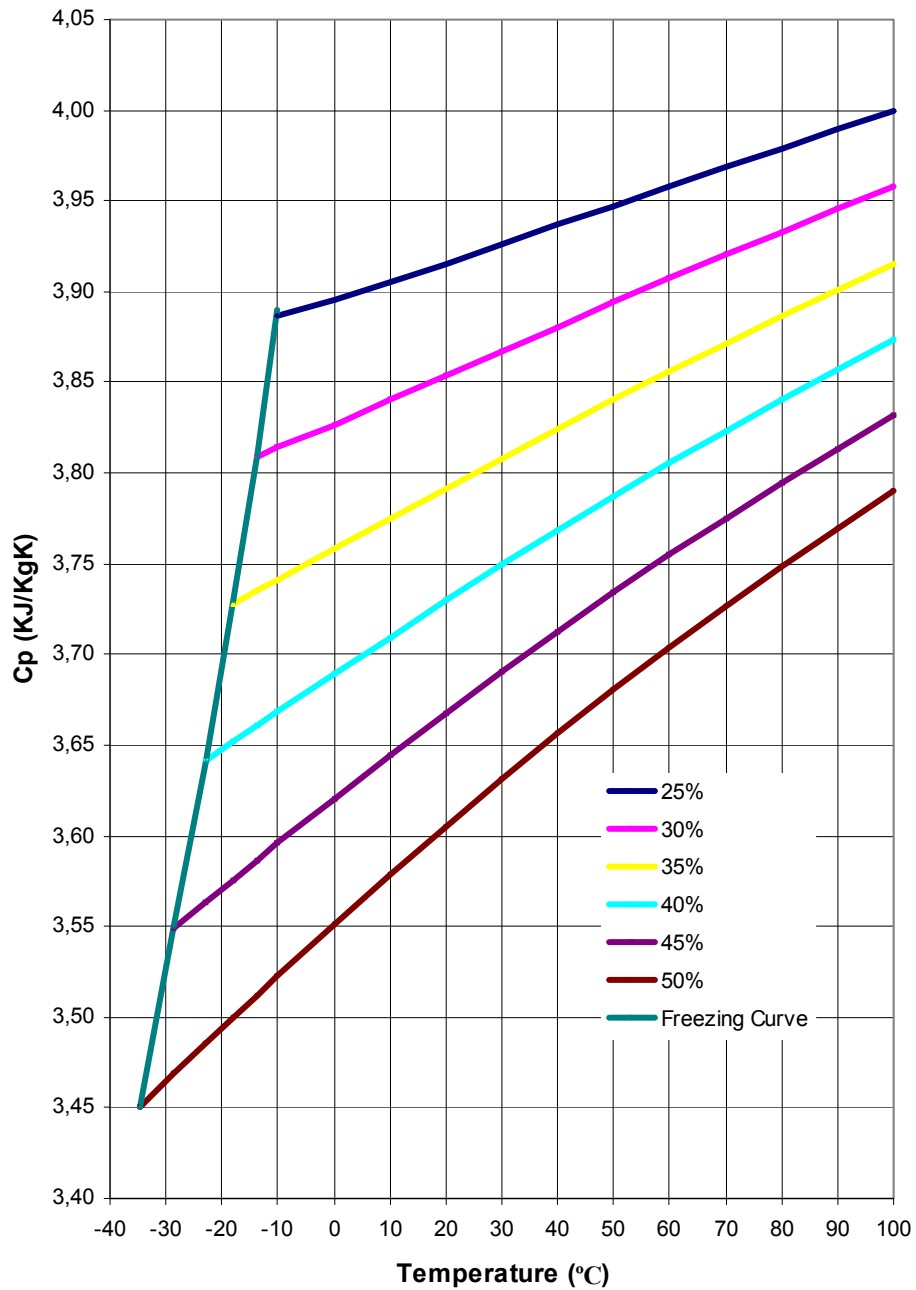


Density .vs. %V/V Propylene Glycol



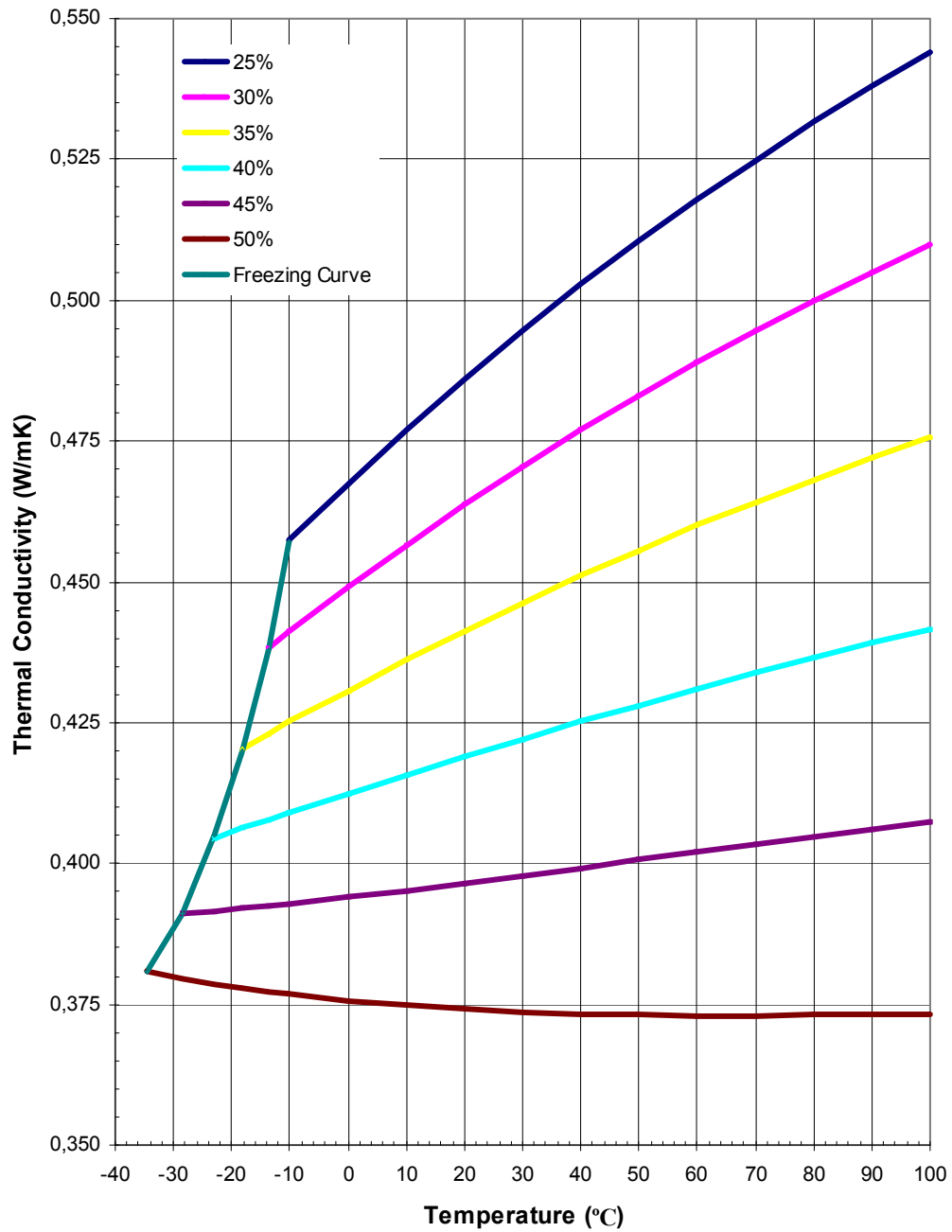


Specific Heat Capacity .vs. %V/V Propylene Glycol



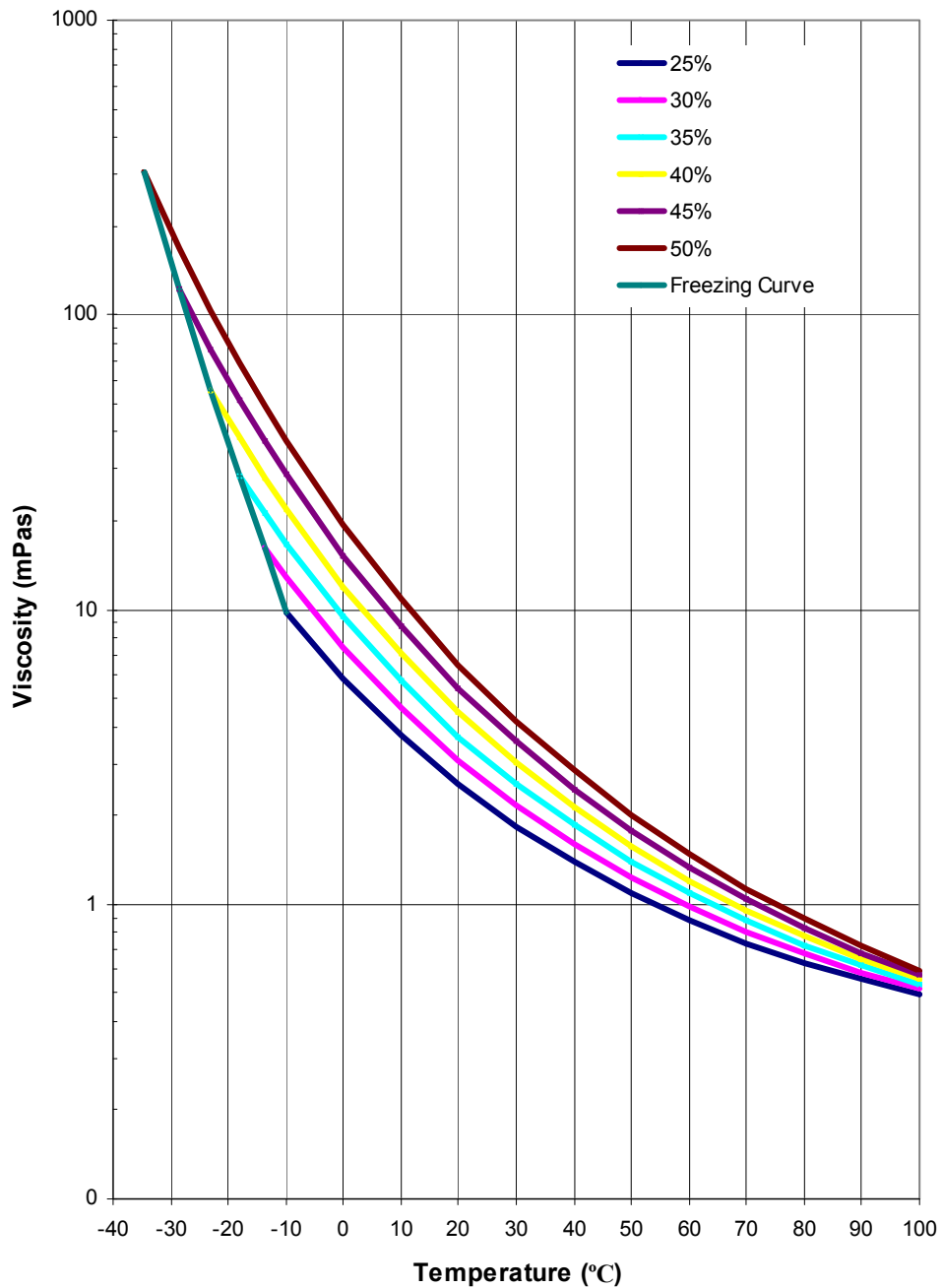


Thermal Conductivity .vs. %V/V Propylene Glycol



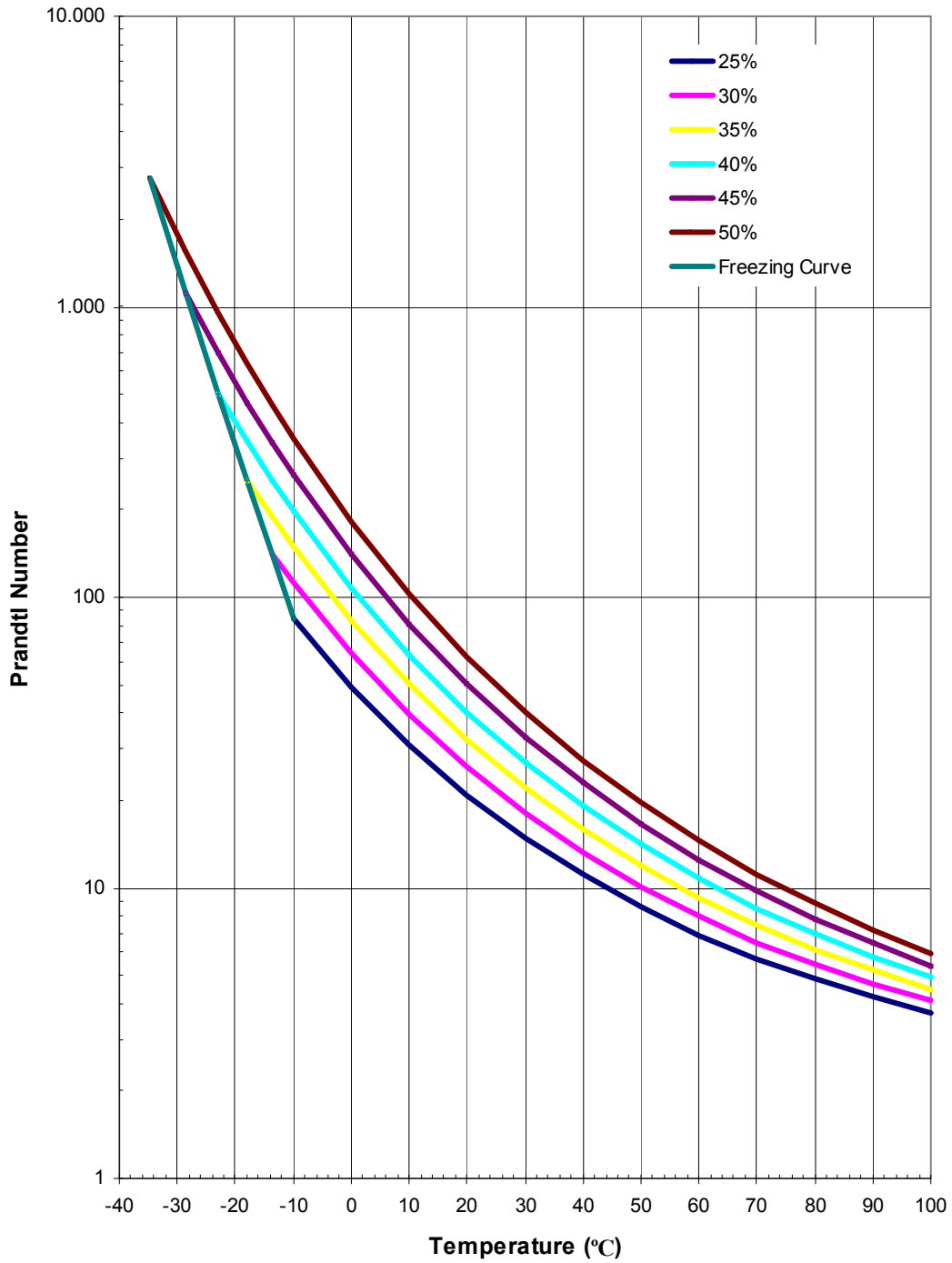


Dynamic Viscosity vs %V/V Propylene Glycol



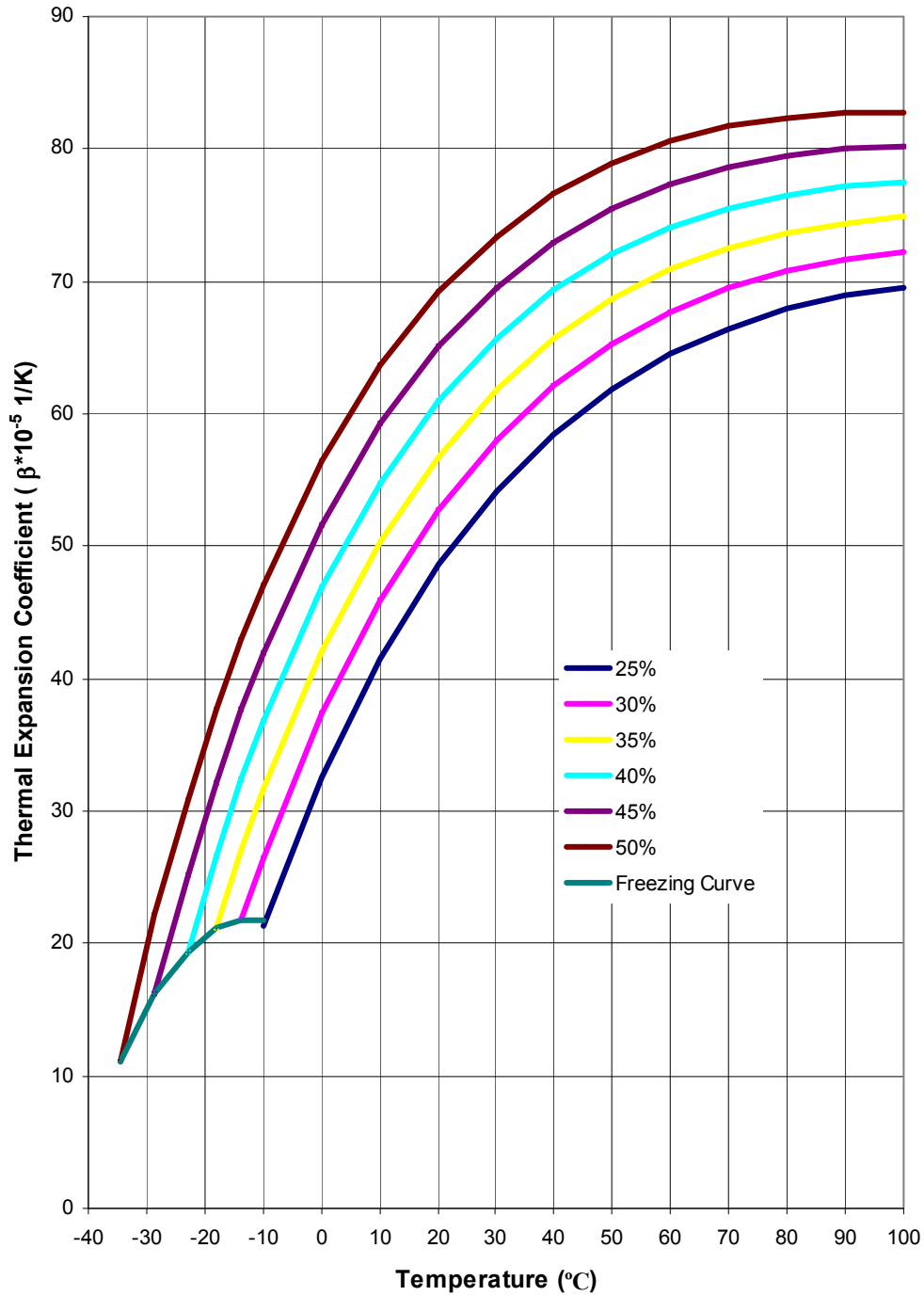


Prandtl Number .vs. %V/V Propilene Glycol



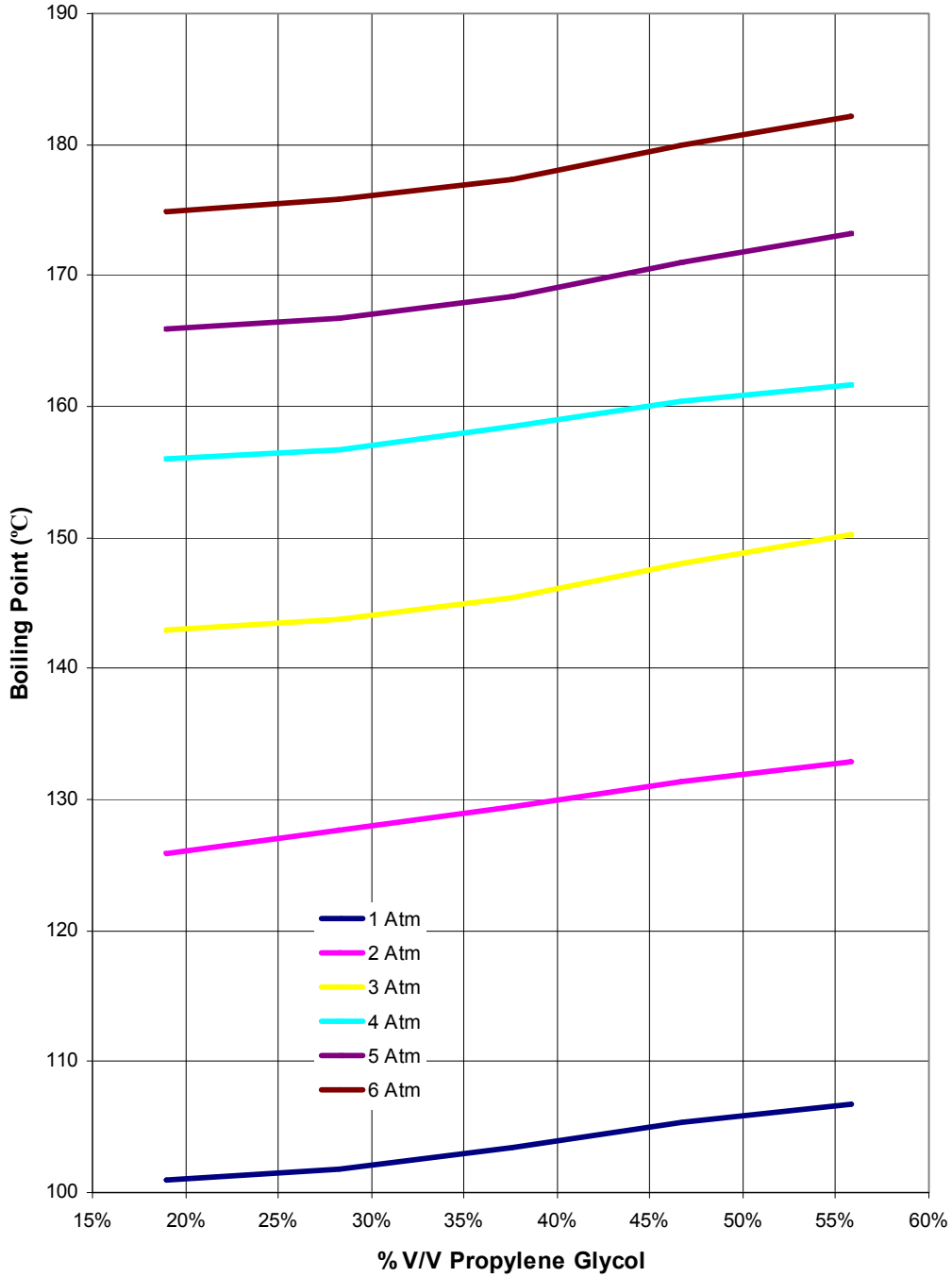


Thermal Expansion Coefficient





Boiling Point .vs. %V/V Propylene Glycol



The information contained in this document is based on our current knowledge and experience. This information is presented for good use of the products and it is not part, necessarily, of the technical specifications.

It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.