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BSI Standards Publication

Plastics pipes and fittings for industrial applications — Collection of data on combined chemical-resistance

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National foreword

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TECHNICAL REPORT

ISO/TR 10358

Second edition
2021-06

Plastics pipes and fittings for industrial applications — Collection of data on combined chemical-resistance

Tubes et raccords en matières plastiques pour applications industrielles — Collecte de données sur la résistance chimique combinée

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Contents

Pages

Foreword iv
Introduction vi
1 Scope 1
2 Normative references 2
3 Terms and definitions 2
4 Symbols used to describe the fluids 2
5 Chemical resistance classification 3
5.1 General 3
5.2 Procedure 4
5.3 Performances 4
Bibliography 215

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 3, *Plastics pipes and fittings for industrial applications*.

This second edition cancels and replaces the first edition (ISO/TR 10358:1993), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Due to the rare use of PE-LD inside industrial applications and the comparability of its chemical behaviour to PE-HD, the reference to PE only has been indicated.

— Considering the ever more frequent use in industrial fields, the following materials have been introduced:

  — ECTFE

  — PA-U

  — PFA

  — PPS

  — PSU

  — PTFE

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— Due to the different behaviours of the materials considered in this document, they have been gathered in two separate tables with different temperature ranges.

— A column with CAS (Chemical Abstracts Service) number, where available, has been introduced for the listed substances.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The tables in this document provide a preliminary informative collection of the chemical resistance of thermoplastic materials used to manufacture piping components which are not subjected to pressure or other stresses. They take into account the working conditions used, in particular the temperatures and concentrations of the chemical fluids to which a material may be exposed. To evaluate the behaviour of the different materials against the chemicals, data coming from published literature and industry experience were considered. To obtain numerical values for changes in mass or for mechanical properties, tests can be carried out in accordance with ISO 175, ISO 4433 (all parts) and ISO 22088 (all parts).

Careful consideration is paid by the end user when the fluid being transported is a combination of two or more chemicals. The resulting combination can have the potential to negatively affect the material from which the pipeline is made[12].

Careful consideration is paid by the end user to composite structures. The following data, collected from literature, only address the effect on an individual material. Aspects for composite structure such as layers, reinforcements and/or fillers that are added above a negligible amount, are outside of the scope of this document[12].

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Plastics pipes and fittings for industrial applications — Collection of data on combined chemical-resistance

1 Scope

This document collects available data on combined chemical resistance of thermoplastic materials typically used to manufacture piping components for industrial applications, against fluids over a range of temperatures.

The base thermoplastic materials covered by this classification are:

Polyethylene	PE

NOTE 1 The PE considered in this document corresponds to PE-HD, with a minimum density value of 0,935 g/cm^3 (e.g.: PE63, PE80, PE100, PE100-RC, PE-RT).

Polypropylene	PP (PP-R and PP-RCT, PP-H, PP-B)
Polyvinyl chloride, unplasticized	PVC-U
Polyvinyl chloride, chlorinated	PVC-C
Polybutylene	PB
Acrylonitrile/butadiene/styrene	ABS
Polyvinylidene fluoride	PVDF

NOTE 2 This document considers homopolymer PVDF.

Cross-linked polyethylene	PE-X (PE-Xa, PE-Xb, PE-Xc)
Ethylene chloro trifluoro ethylene	ECTFE
Polyamide, unplasticized	PA-U (PA-U11, PA-U12)

NOTE 3 This document focuses on PA-U11 and PA-U12 only, as these long chained PA-U are standardized according to ISO 16486-1; short chained (e.g. PA 66) and plasticized PAs are not used for monolithic plastic piping components.

Polysulfone	PSU
Perfluoralkoxy	PFA

NOTE 4 Temperatures higher than 200°C can be applied after an evaluation with the raw material manufacturer.

Polytetrafluoroethylene	PTFE

NOTE 5 Temperatures higher than 200°C can be applied after an evaluation with the raw material manufacturer.

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Polyphenylene sulphide PPS

NOTE 6 PPS is new with regards to industrial application and chemical resistance issues; for this reason, manufacturers and end-users are advised to assess the chemical suitability of the material.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Symbols used to describe the fluids

Column 1:

Identification number of the fluid.

Column 2:

The fluids are listed by their most common names, including trivial and trade names, in English alphabetical order.

With some of the chemicals, synonyms are listed, also in alphabetical order, with a reference to the first or the most widely used name.

NOTE In some cases, further information is given:

Subl. sublimes

Dec. decomposes

Column 3:

CAS nr. or internationally recognized code for the fluid listed in column 2.

Column 4:

Melting points (m.p.) are given where appropriate, the values referring to fluids of technical-grade purity.

Column 5:

Boiling points (b.p.) are given where appropriate, the values referring to fluids of technical-grade purity at standard atmospheric pressure, unless otherwise stated in brackets below. In that case a different pressure in mm Hg height is indicated.

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Column 6:

The concentration and/or purity of the fluid is indicated, using the following symbols:

Dil. sol. Dilute aqueous solution at a concentration equal to or less than 10 %.

Sol. Aqueous solution at a concentration higher than 10 %, but not saturated.

Sat. sol. Saturated aqueous solution, prepared at 20 °C.

tg At least technical-grade purity.

tg-l Technical grade, liquid.

tg-g Technical grade, gas

Work. sol. Working solution of the concentration usually used in the industry concerned.

Susp. Suspension of solid in a saturated solution at 20 °C.

The concentrations are expressed as a percentage by mass at 20 °C, unless otherwise stated.

Column 7:

Test temperatures at which chemical resistance determined.

Column 8, etc.:

The chemical resistance of the pipeline materials is given in accordance with the classification system explained in 5.1.

5 Chemical resistance classification

5.1 General

Even if the base thermoplastics show full resistance to a fluid at a defined temperature, their application inside a piping system should be evaluated to verify the resistance of the joints.

The chemical resistance classification is given in Table 1 for polymers with thermal rating up to and including 100 °C, and in Table 2 for polymers with higher thermal rating.

The following chemical resistance information:

S (satisfactory), L (limited) or NS (not satisfactory),

given in Tables 1 and 2, is only suitable for materials which are used to produce piping components without the influence of internal and external mechanical stresses (for example, those caused by internal pressure, flexural stresses).

For different percentages not given in Tables 1 and 2 and mixtures of fluids, the compatibility will be checked with the material supplier.

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5.2 Procedure

The procedure used to evaluate the chemical resistances of the table below refers to ISO 175. ISO 4433-1, ISO 4433-2, ISO 4433-3 or ISO 4433-4 may also be used for polymers indicated in the scope.

In order to assess the behaviour of piping components for the conveyance of fluids under pressure, or in the presence of other stresses, the tests performed by the end user will be considered.

To assess the tendency of a material towards environmental stress cracking, tests may be carried out in accordance with all parts of the ISO 22088 series.

5.3 Performances

The material applicability at temperatures close to upper limits could be limited due to thermal aging.

Not all thermoplastic materials are technically suitable for transport of gases under pressure due to risk of explosion when the energy level is locally raised by gas compression

Other properties of the pipeline material (e.g. permeability) or of the conveyed fluid (e.g. toxicity, flammability, etc.) should be considered separately.

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Table 1 — Chemical-resistance classification data of thermoplastics materials with thermal rating up to and including 100 °C

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
1	Acetaldehyde	75-07-0	-123	21	40	20	S	S		NS	NS	NS	S	L
						40	L	L		NS	NS	NS	L	L
						60	L	L		NS	NS	NS	L	NS
						80					NS			
						100								
					tg-l	20	S	L	L	NS	NS	NS	S	L
					tg-g	40	L	L	L	NS	NS	NS	L	L
						60	L	L	NS	NS	NS	NS	L	L
						80					NS			NS
						100								
2	Acetamide	60-35-5	82	221	5	20	S	S	S	NS	NS	NS	S	S
						40	S	S	L		NS	NS	S	
						60	S	S	L				S	
						80								
						100								
3	Acetic acid	64-19-7	17	118	Up to 10	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	S
						80		L			S		S	L
						100		L						
					10 to 40	20	S	S	S	L	L	NS	S	L
						40	S	S	L	L	L	NS	S	
						60	S	L	L	L	L		S	
						80		L					S	
						100		L						
					50	20	S	S	S	L	L	NS	S	L
						40	S	S	L	L	L	NS	S	
						60	L	L	L	L	L		L	
						80		L					L	
						100		L						
					60	20	S	L	L	L	L	NS	S	L
						40	L	L	L	L	L	NS		
						60	L	L	NS	NS	L			
						80		L						
						100		NS						

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
3	Acetic acid (cont'd)	64-19-7	17	118	80	20	L	L	L	NS	L	NS	S	L
						40	L	L	L	NS	L	NS		
						60	L	NS	L	NS	L			
						80		NS						
						100		NS						
					95	20	L	S	NS	NS	L		L	L
						40	L	L	NS	NS	NS		L	NS
						60	L	L		NS	NS		L	
						80		L						
						100		NS						
	Acetic acid, glacial				> 96	20	S	S	L	NS	NS	NS	S	NS
						40	L	L	NS	NS	NS	NS		
						60	L	L	NS	NS	NS	NS		
						80		L	NS		NS			
						100		NS						
4	Acetic anhydride	108-24-7	-73	140	tg-l	20	S	S	S	NS	NS	NS	S	L
						40	L	L	S	NS	NS	NS		NS
						60	L	L	S	NS	NS			
						80								
						100								
5	Acetone	67-64-1	-95	56	Up to 10	20	S	S	S	NS	NS	NS	S	S
						40	S	L		NS	NS	NS	S	S
						60	L	L		NS	NS	NS	L	L
						80		L						
						100		NS						
					tg-l	20	L	S	S	NS	NS	NS	L	S
						40	L	L		NS	NS	NS	L	L
					tg-g	60	L	L		NS	NS		L	L
						80		NS						NS
						100		NS						
6	Acetophenone	98-86-2	20	202	tg-l	20	S	S		NS	NS	NS	S	L
						40	L	L		NS	NS	NS		L
						60	L	L		NS	NS			L
						80								
						100								
7	Acetyl chloride	75-36-5	-112	51	tg-l	20	L	L		NS	NS	NS	L	
						40	NS	NS		NS	NS	NS	NS	
					tg-g	60								
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
8	Acetylene, gas	74-86-2	-84		tg-g	20	S	S	L	NS	NS	NS	S	S
						40	S	S	NS	NS			S	S
						60	S	L	NS				S	S
						80								
						100								
9	Acrylonitrile	107-13-1	-82	77	tg-l	20	S	S		NS	NS	NS	S	L
						40	S	L			NS	NS	S	L
						60	L	L					L	L
					tg-g	80								
						100								
10	Adipic acid	124-04-9	151	265	Sat. sol. (1,4%)	20	S	S	S	S	S	NS	S	L
				(100 mm)		40	S	S	L	S	S		S	L
						60	S	S	L	L	S		S	L
						80					S			L
						100								
						80								
11	Air	132259-10-0	-213	193	tg-g	20	S	S	S	S	S	S	S	
		ZVG nr. 80000				40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80					S			
						100								
12	Allyl alcohol	107-18-6	-129	97	tg-l	20	S	L	S	L	NS	NS	S	L
						40	S	L	S	NS			S	
						60	L	L	S	NS			L	
						80								
					tg-g	100								
13	Allyl chloride	107-05-1	-136	45	Sat. sol.	20	L	L	L	NS	NS	NS	L	
						40	NS	L	L	NS	NS	NS	NS	
						60	NS	NS	L	NS	NS		NS	
						80								
						100								
14	Almond oil				tg-l	20	S	S		S	L		S	
						40	L	S		L	L		L	
						60	L	L		L	L		L	
						80		L						
						100		NS						
15	Alum (see 21)													

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
16	Aluminium chloride	7446-70-0			Sat. sol.	20	S	S	S	S	S	L	S	NS
						40	S	S	S	S	S	L	S	
						60	S	S	S	L	S		S	
						80		S			L			
						100		L						
17	Aluminium fluoride	7784-18-1	250		Susp.	20	S	S	S	S	S	L	S	NS
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			L			
						100		NS						
18	Aluminium hydroxide	21645-51-2			Susp.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100								
19	Aluminium nitrate	13473-90-0			Sat. sol.	20	S	S	S	S	S	L	S	NS
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			L			
						100								
20	Aluminium chloride oxyde	13596-11-7			Susp.	20	S	S	S	S	S	L	S	NS
						40	S	S	S	S	S	L	S	
						60	S	S	S	L	S		S	
						80		S			L			
						100								
21	Aluminium potassium sulphate	10043-67-1	92,5		Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100		S						
22	Aluminium sulphate	10043-01-3			Sat. sol.	20	S	S	L	S	S	L	S	S
						40	S	S	NS	S	S	L	S	S
						60	S	S	NS	S	S		S	L
						80		S			L			L
						100		L						

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
23	Ammonia, aqueous	1336-21-6			Sat. sol.	20	S	S	S	S	NS	L	S	S
						40	S	S	S	L	NS	L	S	S
						60	S	S	S	L	NS		S	S
						80					NS			S
						100								
24	Ammonia, dry gas	7664-41-7	-78	-34	tg-g	20	S	S	S	S	NS	NS	S	S
						40	S	S	S	S	NS	NS	S	S
						60	S	L	S	S	NS		S	S
						80		L			NS			
						100		NS						
25	Ammonia, wet gas	7664-41-7	-78	-34	tg-g	20	S	S	S	S	L	NS	S	S
						40	S	S	L	L	NS	NS	S	S
						60	S	L	L	L	NS		S	
						80		L			NS			
						100		NS						
26	Ammonium acetate	631-61-8	114		Sat. sol.	20	S	S		S	S	L	S	S
						40	S	S		S	S	NS	S	S
						60	S	S		L	S		S	S
						80		S			L			
						100		S						
27	Ammonium bifluoride	1341-49-7	125		Sat. sol.	20	S	S	S	S	NS	NS	S	
						40	S	S	S	L			S	
						60	S	S	S	L			S	
						80		S						
						100								
28	Ammonium carbonate	506-87-6			Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	S
						80		S						
						100		L						
29	Ammonium chloride	12125-02-9			Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	
						60	S	S	S	L	S		S	
						80		S			L			
						100		L						
30	Ammonium fluoride	12125-01-8			Up to 20	20	S	S	S	S	S	L	S	
						40	S	S	S	L	S	NS	S	
						60	S	S	S	NS	S		S	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
30	Ammonium fluoride (cont'd)	12125-01-8			25	20	S	S	S	S	S	L	S	
						40	S	S	L	L	S	NS	S	
						60	S	S	L	L	S		S	
						80								
						100								
					Sat. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	L	L	L		S	
						60	S	S	L	L	L		S	
						80								
						100								
31	Ammonium hydrogen carbonate	1066-33-7			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	L	NS	S	
						60	S	S	S	S	NS		S	
						80								
						100								
32	Ammonium metaphosphate	13446-46-3			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	NS	S	
						60	S	S	S	S	S		S	
						80		S						
						100		L						
33	Ammonium molybdate	13106-76-8			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	L	L	L		S	
						80								
						100								
34	Ammonium nitrate	6484-52-2	170		Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	L	S	L	S	S
						60	S	S	S	L	S		S	S
						80		S			S			
						100		S						
35	Ammonium persulphate	7727-54-0			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80								
						100								
36	Ammonium phosphate	7722-76-1	190		Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	L	S	L	S	S
						60	S	S	S	L	S		S	S
						80		S			S			
						100		L						

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
37	Ammonium sulphate	7783-20-2			Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	L
						60	S	S	S	L	S		S	L
						80		S			S			
						100		L						
38	Ammonium sulphide	12135-76-1			Sat. sol.	20	S	S	S	S	L	L	S	
						40	S	S	S	S	L	L	S	
						60	S	S	S	L	L		S	
						80		S			NS			
						100								
39	Ammonium thiocyanate	1762-95-4	149		Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80								
						100								
40	Amyl acetate	628-63-7	-71	149	tg-l	20	S	L	NS	NS	NS	NS	S	S
						40	S	NS		NS	NS	NS	S	S
						60	L	NS		NS	NS		L	S
						80								L
						100								
41	Amyl alcohol	71-41-0	-78	138	tg-l	20	S	S	S	S	L	NS	S	S
						40	S	S	S	S	L	NS	S	S
						60	L	S	S	L	L		L	S
						80		L			L			L
						100		NS						
42	Amyl chloride	543-59-9	-99	108	tg-l	20	NS	NS	NS	NS	NS	NS	NS	
						40	NS	NS		NS	NS	NS	NS	
						60	NS	NS		NS	NS		NS	
						80								
						100								
43	Aniline	62-53-3	-6	184	Sat. sol.	20	S	L	S	NS	NS	NS	S	L
						40	S	L	S	NS	NS	NS	S	NS
						60	L	L	S	NS			L	
						80								
						100								
					tg-l	20	S	L	L	NS	NS	NS	S	L
						40	L	L	L	NS	NS	NS	L	NS
						60	L	L	L	NS	NS		L	
						80		NS						
						100								

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
44	Aniline hydrochloride	142-04-1	198	245	Sat. sol.	20	L	L	NS	NS	NS	NS	L	
						40	L	L	NS	NS	NS	NS	L	
						60	L	L	NS	NS	NS		L	
						80								
						100								
45	Anisole	100-66-3	-37	154	tg-l	20	L	L	NS	NS	NS	NS	L	L
						40	L	L	NS	NS	NS	NS	L	L
						60	NS	NS	NS	NS	NS	NS	NS	L
						80					NS			
						100								
46	Anthraquinone sulphonic acid	153277-35-1	214		Susp.	20	S	S		S	S	NS	S	
						40	S	S		L	S		S	
						60	S	S		L	S		S	
						80								
						100								
47	Antimony (III) chloride	10025-91-9	73	223	Sat. sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80								
						100								
48	Apple juice				Work. sol.	20	S	S	S	S	S	S	S	S
						40	S	S		S	S	S	S	S
						60	S	S		S	S		S	S
						80		S						
						100		S						
49	Aqua regia	8007-56-5			HCl:HNO3 = 3:1	20	NS	NS	NS	L	S	NS	NS	NS
						40	NS	NS	NS	L	L	NS	NS	
						60	NS	NS	NS	NS	NS		NS	
						80		NS						
						100		NS						
50	Arsenic acid	7778-39-4	35		Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	L	S	NS	S	
						60	S	S	S	L	S		S	
						80		L			L			
						100		NS						
51	Arsenic trioxide	1327-53-3	275	460	Sol.	20	L	L	NS		S	NS	L	
						40	L	L	NS		S	NS	L	
						60	L	L	NS		S	NS		
						80					S			
						100								

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Full document details: PD ISO/TR 10358:2021

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52	Barium bromide	10553-31-8			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100		L						
53	Barium carbonate	513-77-9			Susp.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100		L						
54	Barium chloride	10361-37-2			Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	S
						80		S			S			S
						100		L						
55	Barium hydroxide	17194-00-2	78		Sat. sol.	20	S	S	S	S	L	L	S	
						40	S	S	S	S	L	L	S	
						60	S	S	S	L	L		S	
						80					L			
						100								
56	Barium sulphate	7727-43-7			Susp.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100		L						
57	Barium sulphide	21109-95-5			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100		L						
58	Beer				Work. Sol.	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80		S						
						100		S						

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
59	Benzaldehyde	100-52-7	-26	178	0,1	20	S	S	S	L	NS	NS	S	L
						40	S	S	S	NS	NS	NS	S	
						60	L	S	S	NS			L	
						80								
						100								
					tg-l	20	S	S	L	NS	NS	NS	S	L
						40	L	L	NS	NS	NS	NS	L	NS
						60	L	L	NS	NS	NS		L	NS
						80								
						100								
60	Benzene	71-43-2	6	80	tg-l	20	L	L	NS	NS	NS	NS	L	S
						40	L	L	NS	NS	NS	NS	L	L
						60	L	NS	NS	NS	NS		L	L
						80		NS			NS			
					tg-g	100		NS						
61	Benzoic acid	65-85-0	122	250	Sat. sol.	20	S	S	S	L	S	L	S	L
						40	S	S	S	L	S	L	S	
						60	S	S	S	L	L		S	
						80		S			L			
						100		L						
62	Benzoyl chloride	98-88-4	-1	197	tg-l	20	L	L		NS	NS	NS	L	
						40	L			NS		NS	L	
						60	L			NS			L	
						80								
						100								
63	Benzyl alcohol	100-51-6	-15	205	tg-l	20	S	S		L	NS	NS	S	L
						40	S	S		NS	NS	NS	S	NS
						60	L	L		NS	NS		L	
						80		L						
						100								
64	Benzyl chloride	100-44-7	-39	179	tg-l	20	L	L			NS	NS	L	
						40	NS	NS			NS	NS	NS	
						60	NS	NS			NS		NS	
						80								
						100								
65	Bismuth carbonate	18400-34-5			Sat. sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80		S						
						100								

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66	Borax	1330-43-4			Sol.	20	S	S	S	S	S	S	S	S
		1303-96-4				40	S	S	S	S	S	S	S	S
						60	S	S	S	L	S		S	S
						80		S			S			
						100		L						
67	Boric acid	10043-35-3	168		Dil. sol.	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	S
						60	S	S	S	L	S		S	S
						80		S			S			
						100		L						
					Sat. sol.	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	S
						60	S	S	S	L	S		S	S
						80		S			S			
						100		L						
68	Boron trifluoride	7637-07-2	-129	-101	Sat. sol.	20	S	S	L	S	S	NS	S	
		13319-75-0				40	S	S	L				S	
						60	S	S	L				S	
						80		S						
						100								
69	Bromic acid (dec. at 100°C)	7789-31-3			10	20	S	S		S	S	NS	S	
						40	S	S		S	S		S	
						60	S	S		S	S		S	
						80		S						
						100								
					50	20	NS	NS	NS				NS	
						40	NS	NS	NS				NS	
						60	NS	NS	NS				NS	
						80								
						100								
70	Bromine, gas	7726-95-6	-7	58	tg-g	60	NS	NS	NS	NS		NS	NS	NS
						80								
						100								
71	Bromine, liquid	7726-95-6	-7	58	tg-l	20	NS	NS	NS	NS		NS	NS	NS
						40	NS	NS	NS	NS		NS	NS	NS
72	Bromine water	7726-95-6			Sat. sol.	20	L	L	L	L	L	NS	L	NS
						40	L	L	NS	L	L		L	NS
						60	NS	NS	NS	L	L		NS	NS
						80		NS						
						100		NS						

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Full document details: PD ISO/TR 10358:2021

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73	Bromoethane	74-96-4	-119	38	tg-l	20	NS	NS		NS		NS	NS	
						40	NS	NS		NS		NS	NS	
					tg-g	60	NS	NS		NS		NS	NS	
						80								
						100								
74	Butadiene, gas	106-99-0	-109	-5	tg-g	20	L	L	NS	L	L	NS	L	L
		590-19-2		(713 mm)		40	NS	NS		L	L		NS	
						60	NS	NS		L	L		NS	
						80		NS						
						100		NS						
75	Butane, gas	106-97-8	-138	-0,5	tg-g	20	S	S	NS	S	S	L	S	S
						40	S	S	NS	S	L	L	S	S
						60	S	L	NS	L	L	L	S	S
						80		L						
						100								
76	Butanediol	107-88-0	-50	207	10	20	S	S	L	L	L		S	
						40	S	S	L	NS	L		S	
						60	L	L	NS	NS	L		L	
						80		L			L			
						100		NS						
					tg-l	20	L	L	L	L	L	NS	L	
						40	L	L	L	NS	L	NS	L	
						60	L	L	L	NS	L	NS	L	
						80					L			
						100								
77	n-Butanol	71-36-3	-89	118	tg-l	20	S	S	S	S	L	NS	S	S
						40	S	S	S	S	L	NS	S	L
						60	S	L	S	L	L	NS	S	NS
						80					L			
						100								
78	Butyl acetate	123-86-4	-77	126	tg-l	20	L	L	L	NS	NS	NS	L	S
						40	L	L	L	NS	NS	NS	L	S
						60	L	L	NS	NS	NS	NS	L	S
						80		NS						L
						100		NS						
79	Butyl glycol	111-76-2	-75	171	tg-l	20	S	S	S	L	NS	L	S	
						40	L	L				NS	L	
						60	L	L				NS	L	
						80								
						100								

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Full document details: PD ISO/TR 10358:2021

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80	Butylphenol	89-72-5	98	237	Sat. sol.	20	S	S		L	L	NS	S	NS
		88-18-6				40	S	L		NS	NS	NS	S	
		98-54-4				60	S	L		NS	NS	NS	S	
		585-34-2				80								
						100								
81	Butyl phthalate	84-74-2	-35	340	tg-l	20	S	S	NS	NS	NS	NS	S	
						40	L	L		NS	NS	NS	L	
						60	L	L		NS	NS	NS	L	
						80		NS						
						100		NS						
82	Butyric acid	107-92-6	-5	164	20	20	S	S	S	L	L	NS	S	L
						40	S	L	L	L	L	NS	S	
						60	L	L	L	NS	L	NS	L	
						80								
						100								
					tg-l	20	S	L	L	NS	L	NS	S	L
						40	S	L	NS	NS	NS	NS	S	
						60	L	L	NS	NS	NS		L	
						80								
						100								
83	Butyryl chloride	141-75-3	-89	100	tg-l	20	L	L	NS		NS	NS	L	
						40	L	L				NS	L	
						60								
						80								
						100								
84	Calcium bisulphite	13780-03-5			Sat. sal.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80					S			
						100								
85	Calcium bromide	7789-41-5	730		Sat. sal.	20	S	S	S	S	S	S	S	
		71626-99-8				40	S	S	S	S	S	S	S	
						60	S	S	L	S	S		S	
						80		S			S			
						100								
86	Calcium carbonate	471-34-1			Susp.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S	L	S	
						80		S						
						100		S						

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

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87	Calcium chlorate	10137-74-3	100		Sat. sol.	20	L	L	L	S	S	L	L	
						40	L	L	L	S	S	L	L	
						60	L	L	L	S	S	L	L	
						80								
						100								
88	Calcium chloride	10043-52-4	772	1670	Sat. sol.	20	S	S	S	S	S	S	S	S
		10035-04-8				40	S	S	S	S	S	S	S	S
		25094-02-4				60	S	S	S	S	S		S	S
		7774-34-7				80		S			S		S	S
						100		S						
89	Calcium hydroxide	1305-62-0			Sat. sol.	20	S	S	S	S	L	L	S	
						40	S	S	S	S	L	L	S	
						60	S	S	S	S	L		S	
						80								
						100								
90	Calcium hypochlorite	7778-54-3			10	20	L	L	L	S	L	L	L	
						40	L	L	L	S	L	L	L	
						60	L	L	L	L	L		L	
						80					L			
						100								
91	Calcium nitrate	10124-37-5	45		Sat. sol.	20	S	S	S	S	S	L	S	S
		13477-34-4				40	S	S	S	S	S	L	S	L
						60	S	S	S	S	S		S	L
						80							S	
						100								
92	Calcium sulphate	7778-18-9	1450		Susp.	20	S	S	S	S	S	S	S	
		10034-76-1				40	S	S	S	S	S	S	S	
		10101-41-4				60	S	S	S	S	S		S	
		13397-24-5				80								
						100								
93	Calcium sulphide	20548-54-3	2400		Dil. sol.	20	L	S		S	S	L	L	
						40	L	S		S	S	L	L	
						60	L	S		S	S		L	
						80		S						
						100								

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
94	Calcium hydrogen sulphide	9046-53-1			Sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80								
						100								
95	Camphor oil			175 to 200	tg-l	20	NS	NS		NS	NS	NS	NS	S
						40	NS	NS						
						60	NS	NS						
						80		NS						
						100		NS						
96	Carbon dioxide aqueous sol.	124-38-9			Sat. sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80					S			
						100								
97	Carbon dioxide, dry gas	124-38-9			tg-g	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80					S			
						100								
98	Carbon dioxide, wet gas	124-38-9			tg-g	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80								
						100								
99	Carbon disulphide	75-15-0	-112	46	tg-l	20	L	L	NS	NS	NS	NS	L	S
						40	NS	L	NS	NS	NS	NS	NS	L
					tg-g	60	NS	NS	NS	NS	NS		NS	NS
						80								
						100								
100	Carbon monoxide, gas	630-08-0			tg-g	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			S			
						100								

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Full document details: PD ISO/TR 10358:2021

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101	Carbon tetrachloride	56-23-5	-23	77	tg-l	20	L	NS	NS	NS	NS	NS	L	NS
						40	NS	NS	NS	NS		NS	NS	
						60	NS	NS	NS	NS			NS	
					tg-g	80		NS						
						100		NS						
102	Castor oil				tg-l	20	S	S	S	L	NS	NS	S	
						40	S	S	S					
						60	S	S	S					
						80								
						100								
103	Chlorine, aqueous (see 105)													
104	Chlorine, dry gas	7782-50-5			tg-g	20	L	NS	NS	L	L	NS	L	NS
						40	NS	NS	NS	NS	L	NS	NS	NS
						60	NS	NS	NS	NS	L		NS	NS
						80		NS						
						100		NS						
105	Chlorine water				Sat. sol.	20	L	L	L	S	S	NS	L	L
						40	L	L	L	S	S	NS	L	
						60	L	NS	L	L	S		L	
						80					S			
						100								
106	Chlorine, wet gas	7782-50-5			tg-g	20	L	NS	NS	L	L	NS	L	NS
						40	NS	NS	NS	NS	L	NS	NS	NS
						60	NS	NS	NS	NS	L		NS	NS
						80					L			
						100								
107	Chloroacetic acid	79-11-8	61	188	Sol.	20	S	S	NS	S	S		S	NS
						40	S	S	NS	L	L		S	
						60	S	S	NS	L	L		S	
						80					L			
						100								
					Sat. sol.	20	S	S	NS	L	L	NS	S	NS
						40	S	S	NS	L	L		S	
						60	S	S	NS	L	L		S	
						80		L			L		L	
						100								
					50	20	S	S	NS	L	L	NS	S	NS
						40	S	S	NS	L	L		S	
						60	S	S	NS	L	L		S	
						80		L			L			
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
108	Chlorobenzene	108-90-7	-45	132	tg-l	20	L	L	NS	NS	NS	NS	L	L
						40	NS	NS	NS	NS	NS	NS	NS	L
						60	NS	NS	NS	NS	NS		NS	
						80		NS			NS			
						100		NS						
109	Chlorobromo-methane	74-97-5	-86	68	tg-l	20	L	L	NS	NS	NS	NS	L	
						40	L	NS	NS	NS	NS	NS	L	
						60	L	NS	NS	NS	NS	NS	L	
					tg-g	80					NS			
						100								
110	Chloroethanol	107-07-3	-89	129	tg-l	20	S	S	NS	NS	NS	NS	S	
						40	L	L		NS	NS	NS	L	
						60	L	L		NS	NS		L	
						80								
						100								
111	Chloroform	67-66-3	-64	62	tg-l	20	L	L	L	NS	NS	NS	L	NS
						40	L	NS	NS	NS	NS	NS	L	NS
						60	NS	NS	NS	NS	NS		NS	NS
					tg-g	80		NS			NS			
						100		NS						
112	Chloromethane, gas	74-87-3	-97	-24	tg-g	20	L	L	NS	NS	NS	NS	L	
						40	NS	NS		NS	NS	NS	NS	
						60	NS	NS		NS	NS		NS	
						80		NS			NS			
						100		NS						
113	Chloropropanes	75-29-6	-123	36	tg-l	20	NS	NS	NS	NS	NS	NS	NS	
		540-54-5			tg-g	40				NS	NS	NS		
		26446-76-4				60				NS	NS			
						80								
						100								
114	Chlorosulphonic acid	7790-94-5	68	147	50	20	NS	NS	NS	NS	NS	NS	NS	NS
				(vacu um)		40	NS	NS					NS	NS
						60	NS	NS					NS	NS
						80		NS						
						100		NS						

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
115	Chrome alum (chromium potassium sulphate)	10141-00-1			Sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80					S			
						100								
					Sat. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S		S	
						60	S	S	S	S	S		S	
						80								
						100								
116	Chromic acid	7738-94-5			Sat. sol.	20	L	L	NS	L	L	NS	L	NS
						40	L	L	NS		L	NS	L	
						60	NS	NS	NS		L		NS	
						80		NS						
						100		NS						
					10	20	L	L	L	S	S	L	L	NS
						40	L	L	L	S	S	NS		
						60	L	L	L	L	S			
						80		L			L			
						100		NS						
					20	20	L	L	L	S	S	NS	L	NS
						40	L	L	L	S	S	NS		
						60	L	L	L	NS	S			
						80		NS			NS			
						100		NS						
					25	20	L	L	L	S	S	NS	L	NS
						40	L	L	L	S	S	NS		
						60	L	L	L	NS	S			
						80		NS			NS			
						100		NS						
					30	20	L	L	L	S	S	NS	L	NS
						40	L	L	L	S	S		L	
						60	L	NS	L	L	S		L	
						80		NS			NS			
						100		NS						
					40	20	L	L	L	L	L	NS	L	NS
						40	L	L		NS	L			
						60	L	NS			L			
						80		NS						
						100		NS						

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
116	Chromic acid (cont'd)	7738-94-5			50	20	L	L	L	L	L	NS	L	NS
						40	L	L		L	L			
						60	L	NS		L	L			
						80		NS						
						100		NS						
117	Citric acid	77-92-9	153		Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	L
						80		S						NS
						100		S						
118	Coconut oil				Work. sol.	20	S	S	S	L	NS		S	S
						40	S	S	S					S
						60	L	S	S					S
						80								
						100								
119	Cod. liver oil				Work. sol.	20	S	S	S	L	NS	L	S	
						40	NS					L	NS	
						60	NS						NS	
						80								
						100								
120	Copper (II) chloride	7447-39-4			Sat. sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S		S	
						60	S	S	S	S	S		S	
						80								
						100								
121	Copper (II) cyanide	544-92-3			Sat. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S		S	
						60	S	S	S	S	S			
						80								
						100								
122	Copper (II) fluoride	7789-19-7			Dil. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S		S	
						60	S	S	S	S	S		S	
						80								
						100								
					Sat. sol.	20	S	S		S	S		S	
						40	S	S		S	S		S	
						60	S	S		S	S		S	
						80								
						100								
					2	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80								
						100								

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
123	Copper (II) nitrate	3251-23-8			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	L	S	S	S	S		L	
						80		L			S			
						100		L						
					50	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	L	S		S	
						80		L						
						100								
124	Copper (II) sulphate	7758-98-7			Sat. sol.	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	S
						60	S	S	S	S	S		S	S
						80					S			S
						100								
125	Corn oil				Work. sol.	20	S	S	S	L	L	L	S	
						40	L	L	L	L			L	
						60	L	L	L	L			L	
						80								
						100								
126	Cottonseed oil				Work. sol.	20	S	S	S	L	L	L	S	
						40	S	S	L			L	S	
						60	S		L				S	
						80								
						100								
127	Cresols	106-44-5	11 to 34	191 to 203	tg-l	20	S	S	NS	NS	NS	NS	S	NS
		108-39-4				40	S	L	NS	NS	NS	NS	S	NS
		95-48-7				60	L	L	NS	NS	NS	NS	L	NS
						80								
						100								
128	Cresylic acid				Sat. sol (approx. 2-3%)	20	L	NS	L	NS	NS	NS	L	
						40	NS	NS		NS	NS		NS	
						60	NS	NS		NS	NS		NS	
						80								
						100								
					50 (tg-l)	20	L	NS	NS	L	L	NS	L	
						40	NS	NS	NS	NS			NS	
						60	NS	NS	NS	NS			NS	
						80								
						100								

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Full document details: PD ISO/TR 10358:2021

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129	Crotonaldehyde	123-73-9	-74	104	Sat. sol. (18%)	20	S	S	S	NS	NS	NS	S	
		15798-64-8				40	L	L	S	NS	NS		L	
		4170-30-3				60	L	L	L	NS	NS		L	
						80								
						100								
					tg-l	20	S	S	S	NS	NS	NS	S	
						40	L	L	L	NS			L	
						60	L	NS	NS	NS			L	
						80								
						100								
130	Crude oil (free from aromatics)				tg-l	20	S	L	S	S	L	NS	S	S
						40	L	L	S	S			L	S
						60	L	NS	L					S
						80								
						100								
131	Cyclohexane	110-82-7	6	81	tg-l	20	S	S	S	L	L	L	S	S
						40	L	L	L	NS		L	L	S
						60	L	NS	NS	NS			L	L
						80								L
					tg-g	100								
132	Cyclohexanol	108-93-0	24	161	Sat. sol.	20	S	S	S	NS	NS	NS	S	S
						40	S	L	S	NS	NS	NS	S	S
						60	L	L	L	NS	NS		S	S
						80		NS			NS			S
						100								
133	Cyclohexanone	108-94-1	-26	156	tg-l	20	S	L	NS	NS	NS	NS	S	S
						40	L	L	NS	NS	NS	NS	L	L
						60	L	NS	NS	NS	NS		L	NS
						80		NS			NS		L	
						100		NS						
134	Cyclohexylamine	108-91-8		135	tg-l	20	L	L	L	NS	NS	NS	L	
						40	NS	NS	NS				NS	
						60	NS	NS					NS	
						80								
						100								
135	Decalin	91-17-8	-51 to -36	185 to 193	tg-l	20	S	NS	NS	S	L	NS	S	S
		493-01-6				40	L	NS		L	L		L	S
		493-02-7				60	L	NS		L	NS		L	S
						80		NS						L
						100		NS						

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Full document details: PD ISO/TR 10358:2021

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136	Dextrin	9004-53-9			Dil. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	NS	S	S
						60	S	S	S	S	S		S	S
						80		S			S			L
						100								
					Sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	NS	S	S
						60	S	S	S	L	S		S	S
						80		S			S			L
						100								
137	Dextrose (dec. at 200°C)	50-90-7	146		Sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	NS	S	
						60	S	S	S	L	S		S	
						80		S			S			
						100		L						
138	Diacetone alcohol	123-42-2	-47	166	tg-l	20	L	L	NS	NS	NS	NS	L	S
						40	L	L	NS	NS	NS	NS	L	S
						60	L	L	NS	NS	NS	NS	L	L
						80					NS			L
						100								NS
139	Diazonium chloride (benzene diazonium chloride)	100-34-5			Work. sol.	20	L	L	L	L	L	NS	L	
						40								
						60								
						80								
						100								
140	Dichloroacetic acid	79-43-6	11	194	50	20	S	S	S	S	NS	NS	S	
						40	S	S	S	S	NS		S	
						60	L	L	L	L	NS		L	
						80		NS			NS			
						100								
					tg-l	20	L	L	L	NS	NS	NS	L	
						40	L	NS	NS	NS	NS	NS	L	
						60	L			NS			L	
						80								
						100								
141	Dichlorobenzene	95-50-1	-24 to 53	173 to 179	tg-l	20	L	L		NS	NS	NS	L	L
		106-46-7				40	NS	NS		NS	NS	NS	NS	L
		541-73-1				60	NS			NS	NS		NS	
						80								
						100								

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Full document details: PD ISO/TR 10358:2021

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142	Dichloroethylene	75-35-4	-81	34 to 60	tg-l	20	NS	NS		NS	NS	NS	NS	S
		540-59-0				40	NS	NS		NS	NS	NS	NS	S
		156-59-2				60	NS	NS		NS	NS		NS	L
		156-60-5			tg-g	80		NS						L
						100		NS						
143	Dichloromethane (see 259)													
144	Diesel fuel				Work. sol.	20	L	L	L	L	L	NS	L	S
						40	L	L	NS	L	L		L	S
						60	L	L	NS	NS	NS		L	L
						80		NS						
						100		NS						
145	Diethanolamine	111-42-2	28	268	tg-l	20	S	S	S	NS	L	NS	S	S
						40	L	L	L		L	NS	L	L
						60	L	L					L	L
						80								L
						100								
146	Diethylamine	109-89-7	-50	56	tg-l	20	S	S	S	NS	NS	NS	S	NS
						40	L	L	L	NS		NS	L	
					tg-g	60	NS	NS		NS			L	
						80								
						100								
147	Diethyl ether	60-29-7	-116	35	tg-l	20	L	L	L	NS	NS		L	S
					tg-g	40	NS	NS	NS	NS	NS		NS	S
						60	NS	NS	NS	NS	NS		NS	S
						80								
						100								
148	Diethylene glycol	111-46-6	-10	198	tg-l	20	S	S			L	L	S	
						40	S	S				L	S	
						60	S	S					S	
						80								
						100								

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

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149	Diglycolic acid	110-99-6	148		Dil. sol.	20	S	S			L		S	
						40	S	S			L		S	
						60	S	S			L		S	
						80								
						100								
					Sat. sol.	20	S	S		S	L		S	
						40	L	L		S			L	
						60	L	L		L			L	
						80								
						100								
					18	20	S	S		L	L		S	
						40	S	S		L	L		S	
						60	S	S		L			S	
						80								
						100								
150	Diisooctyl phthalate	27554-26-3			tg-l	20	S	S		NS	NS	NS	S	S
						40	L	L		NS		NS	L	S
						60	L	L		NS			L	S
						80								
						100								
151	Dimethylamine	124-40-3			30	20	S	S		S	NS		S	
						40	S							
						60	L							
						80								
						100								
152	Dimethylamine, gas	124-40-3	-96	7	tg-g	20	S	S	NS	NS	NS	NS	S	
						40	S	S	NS			NS	S	
						60	L	L	NS				L	
						80								
						100								
153	Dimethyl-formamide	68-12-2	-61	153	tg-l	20	S	S		NS	NS	NS	S	L
						40	S	S		NS		NS	S	L
						60	L	S		NS			L	L
						80								
						100								
154	Dioctyl phthalate	117-81-7		255 to 265	tg-l	20	S	L	L	NS	NS	NS	S	S
		117-84-0		(20 mm)		40	L	L	NS	NS	NS	NS	L	S
						60	L	L	NS	NS	NS		L	S
						80								L
						100								

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Full document details: PD ISO/TR 10358:2021

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155	Dioxane	123-91-1	12	100	tg-l	20	S	S		NS	NS	NS	S	S
						40	S	L		NS		NS	S	L
						60	S	L		NS			S	L
						80		NS						
						100		NS						
156	Diphenylamine	122-39-4	54	310	Work. sol.	20	S	L				S	S	
						40	L	L				S	L	
						60	L	NS					L	
						80								
						100								
157	Ethanol	64-17-5	-114	78	40	20	S	S		S	L	NS	S	S
						40	L	S		S	L	NS	S	S
						60	L	S		L	L		S	S
						80		S						
						100		S						
					95	20	S	S		S	NS	NS	S	S
						40	S	S		L	NS	NS	S	L
						60	S	S		L	NS		S	L
						80		S						
						100		S						
					tg-l	20	S	S	S	S	NS	NS	S	S
						40	S	S	L	L	NS	NS	S	L
						60	S	S	L	L	NS		S	NS
					tg-g	80		S						
						100		S						
158	Ethanolamine	141-43-5	-84	171	tg-l	20	S	S		NS	NS		S	
						40	L	L					L	
						60		L						
						80								
						100								
159	Ethyl acetate	141-78-6	-83	77	tg-l	20	S	L	L	NS	NS	NS	S	S
						40	L	L	NS	NS		NS	L	S
						60	NS	NS	NS	NS			L	S
					tg-g	80		NS						
						100		NS						
160	Ethyl acrylate	140-88-5		99	tg-l	20	L	L		NS	NS	NS	L	
						40	L	L		NS			NS	
						60	NS	NS		NS			NS	
						80		NS						
					tg-g	100		NS						

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

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161	Ethyl chloride, gas	75-00-3	-139	12	tg-g	20	L	NS		NS	NS	NS	L	
						40	NS	NS		NS	NS	NS	NS	
						60	NS	NS		NS			NS	
						80		NS						
						100		NS						
162	Ethylene bromide	106-93-4	10	132	tg-l	20	L	L	NS		NS		L	
						40	NS	L	NS				NS	
						60	NS	NS	NS				NS	
						80								
						100								
163	Ethylene chlorohydrin	107-07-3		129	tg-l	20	L	L	NS	NS	NS	NS	S	NS
						40	L	L	NS	NS		NS	S	
						60	L	L	NS	NS			S	
						80								
						100								
164	1,1 Ethylene dichloride	75-34-3	-35	57	tg-l	20	L	L		NS	NS	NS	L	L
						40	NS	L		NS		NS	NS	
					tg-g	60	NS	L		NS			NS	
						80								
						100								
165	1,2 Ethylene dichloride	107-06-2	-35	83	tg-l	20	L	L	L	NS	NS	NS	L	L
						40	NS	NS	NS	NS		NS	NS	
						60	NS	NS	NS	NS			NS	
						80								
					tg-g	100								
166	Ethylene glycol	107-21-1	-11	198	tg-l	20	S	S	S	L	L	L	S	S
						40	S	S	S	L	L	L	S	
						60	S	S	S	L	L		S	
						80		L			NS		S	
						100		L						
167	Ethyl ether	60-29-7	-113	35	tg-l	20	L	L	L	NS	NS	NS	S	S
					tg-g	40	L	L	NS	NS		NS		
						60	L	L	NS	NS				
						80								
						100								
168	Ethyl glycol	110-80-5	-90	135	tg-l	20	S	S		NS	NS	NS	S	
						40	L	L				NS	L	
						60	NS	NS					NS	
						80								
						100								

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Document Sharing Hub
Full document details: PD ISO/TR 10358:2021

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169	Ethylene oxide	75-21-8	-113	10	tg-g	20	S	L	NS	NS	NS	NS	L	S
						40	S	L	NS	NS	NS	NS	L	S
						60	S	NS	NS	NS	NS	NS	L	L
						80					NS			NS
						100								NS
170	Ferric chloride	7705-08-0			Sat. sol.	20	S	S	S	S	S	L	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	S
						80		S			S			S
						100		L						S
171	Ferric nitrate	10421-48-4			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			L			
						100		S						
172	Ferric sulphate	10028-22-5			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		S			L			
						100		S						
173	Ferrous chloride	7758-94-3			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S		S	
						80		L			S			
						100		L						
174	Ferrous sulphate	7720-78-7			Sat. sol.	20	S	S	S	S	S	L	S	
						40	S	S	S	S	S	L	S	
						60	S	S	S	S	S	L	S	
						80					L			
						100								
175	Fluoboric acid (dec. at 130°C)	16872-11-0			Sat. sol.	20	S	S	S	S	S	NS	S	
						40	L	L	L	S	S		L	
						60	L	L	L	L	L		L	
						80								
						100								
176	Fluorine gas, dry	7782-41-4			tg-g	20	NS	NS	L	NS	L	NS	L	NS
						40	NS	NS	NS	NS	L	NS	NS	
						60	NS	NS	NS	NS	L	NS	NS	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
177	Fluorine gas, wet	7782-41-4			tg-g	20	NS	NS	L	NS	L	NS	NS	NS
						40	NS	NS	NS	NS	NS	NS	NS	
						60	NS	NS	NS	NS	NS	NS	NS	
						80								
						100								
178	Fluosilicic acid	16961-83-4			Sat. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S	NS	S	
						60	L	L	S	S	S		L	
						80								
						100								
					25	20	S	S		S	S	L	S	
						40	S	S		S	S	NS	S	
						60	S	S		S	S		S	
						80								
						100								
					32	20	S	S		S	S	L	S	NS
						40	S	S		S	S	NS	S	
						60	S	S		S	S		S	
						80					L			
						100								
					40	20	S	S		S	S	NS	S	
						40	S	S		S	S		S	
						60	L	L		S	S		L	
						80								
						100								
					50	20	S	S		L	NS	NS	S	
						40	S	S		NS	NS		S	
						60	L	L			NS		L	
						80								
						100								
179	Formaldehyde	50-00-0	-92	-19	Dil. sol.	20	S	S	S	S	L	NS	S	L
						40	L	L	L	L	L		L	L
						60	NS	NS	L	L	L		NS	NS
						80								
						100								
					30 to 40	20	S	S	S	L	NS	NS	S	L
						40	L	L	L	L	NS	NS	L	NS
						60	L	NS	L	L	NS		NS	NS
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
179	Formaldehyde (cont'd)				50	20	S	S	L	L	NS	NS	S	L
						40	L	L	L	L	NS		L	NS
						60	NS	NS	L	NS	NS		NS	NS
						80								
						100								
180	Formic acid	64-18-6	8	101	10	20	S	S	S	S	S	L	S	NS
						40	S	S	S	S	S	L	S	NS
						60	L	L	L	L	S		S	
						80		L						
						100		L						
					40	20	L	L	L	L	NS	NS	S	NS
						40	L	L	L	L	NS	NS	S	
						60	L	L	NS		NS		L	
						80								
						100								
					50	20	L	L	L	L	NS	NS	S	NS
						40	L	L	L	L	NS	NS	L	
						60	L	L	NS	L	NS	NS	L	
						80								
						100								
					85 to tg-l	20	L	L	L	L	NS	NS	S	NS
						40	L	L	L	L	NS	NS	L	
						60	L	NS	NS	NS	NS	NS	L	
						80		NS						
						100		NS						
181	Freon 12	75-71-8		-30	Work. sol.	20	L	L	S	S	L	L	L	S
						40	NS	NS	S	S	L	L		
						60	NS	NS	S	L	L			
						80								
						100								
182	Freon 22	75-45-6	-157	-41	tg-g	20	L	L	NS	NS	L	NS	L	
						40	L	NS	NS	NS	L	NS	L	
						60	L	NS	NS	NS	L	NS	L	
						80					L			
						100								
183	Fructose	57-48-7	102		Sol.	20	S	S		S	S	S	S	L
						40	S	S		S	S	S	S	L
						60	S	S		S	S		S	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
184	Fruit juice				Work. sol.	20	S	S		S	S	S	S	S
						40	S	S		S	S	S	S	S
						60	S	S		S	S		S	S
						80		S						
						100		S						
185	Furfuryl alcohol	98-00-0	-29	170	tg-l	20	S	S		NS	NS	NS	S	
						40	S	S		NS	NS	NS	S	
						60	L	L		NS	NS	NS	L	
						80								
						100								
186	Gas, manufactured				tg-g	20	S	S	S	S	S		S	
						40			L					
						60			L					
						80								
						100								
187	Gas, natural, dry				tg-g	20	S	S	S	S	S	L	S	
						40	S	L	L	L	L	L		
						60	S	L	L	L	L			
						80								
						100								
188	Gas, natural, wet				tg-g	20	S	S	S	S	S	L	S	
						40	S		L	L	L	L		
						60	S		L	L	L			
						80								
						100								
189	Gasoline (fuel) (free from aromatics)				Work. sol.	20	S	L	NS	S	NS	NS	S	S
						40	S	NS	NS	L	NS	NS		L
						60	L	NS	NS	NS	NS	NS		L
						80								
						100								
190	Gelatine				Sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80								
						100								
191	Ginger ale				Work. sol.	20	S	S				S	S	
						40	S	S					S	
						60	S	S					S	
						80		S						
						100		S						

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
192	Glucose (dec. at > 200°C)	50-99-7	146		Sol.	20	S	S	S	S	S	S	S	L
						40	S	S	S	S	S	S	S	L
						60	S	S	S	L	S		S	
						80								
						100								
193	Glycerine	56-81-5	20	290	tg-l	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	S
						60	S	S	S	S	S		S	L
						80								L
						100								
194	Glycolic acid	79-14-1	80		Sol.	20	L	L	L	S	L	NS	L	
						40	L	L	L	S	L		L	
						60	L	L	L	L	NS		L	
						80								
						100								
					30	20	L	L	L	S	L	NS	L	
						40	L	L	L	S	L		L	
						60	L	L	L	L	NS		L	
						80								
						100								
					65	20	L	L	L		L	NS	L	
						40	L	L	L				L	
						60	L	L	L				L	
						80								
						100								
195	Grapefruit juice				Work. sol.	20	S	S	S	S		S	S	
						40	S	S	S			S	S	
						60	S	S	S				S	
						80		S						
						100		S						
196	Heptane	142-82-5	-90	98	tg-l	20	S	L	NS	S	L	S	S	S
						40	L	NS	NS	L	S		L	S
						60	NS	NS	NS	NS			NS	S
						80		NS						S
					tg-g	100		NS						
197	Hexadecanol	36653-82-4	50	340	Work. sol.	20	S	S		S			S	
						40	S			S			S	
						60	S			S			S	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
198	Hexane	110-54-3	-94	69	tg-l	20	S	S	NS	S	L	NS	S	S
						40	L	L	NS	L	L	NS	L	S
						60	L	L	NS	NS	L		L	S
					tg-g	80								S
						100								
199	1-Hexanol	111-27-3	-52	158	tg-l	20	S	S	S	S	NS		S	
						40	S	S	S	S	NS		S	
						60	S	S	S	S	NS		S	
						80								
						100								
200	Honey				Work. sol.	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	S	S	S
						60	S	S	S	S	S		S	S
						80								
						100								
201	Horseradish				Work. sol.	20	S	S	S	L		L	S	
						40	S	S	S	L		L	S	
						60	S	S	S	L			S	
						80		S					S	
						100		S						
202	Hydrobromic acid	10035-10-6	-87	-67	Up to 20	20	S	S	S	S	S		S	
						40	S	S	S	L	S		S	
						60	S	S	S	L			S	
						80								
						100								
					Up to 50	20	S	S		S	S		S	
						40	S	S		S	S		S	
						60	S	L		L	L		S	
						80					L			
						100								
					66	20	L	L					L	
						40	L	L					L	
						60	NS	NS					NS	
						80								
						100								
					tg-g	20	L	L			S		L	
						40	L	L					L	
						60	L	L					L	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
203	Hydrochloric acid	7647-01-0	-112	-85	Up to 10	20	S	S	S	S	S	L	S	L
						40	S	L	L	S	S	L	S	L
						60	S	L	L	L	S		S	NS
						80		L			S			
						100		L						
					10 to 20	20	S	S	S	S	S	NS	S	L
						40	S	L	L	S	S	NS	S	L
						60	S	L	L	L	S		S	NS
						80					S			
						100								
					Up to 25	20	S	S	S	S	S	NS	S	
						40	S	L	L	S	S	NS	S	
						60	S	L	L	L	S		S	
						80					S			
						100								
					30	20	S	L	S	S	S	NS	S	NS
						40	S	L	L	S	S		S	
						60	S	L	L	L	S		S	
						80		L			L			
						100		NS						
					33	20	S	L	L	S	S	NS	S	NS
						40	S	L	L	S	S		S	
						60	L	L	L	L	S		L	
						80		NS			L			
						100								
					36	20	S	L	L	S	S	NS	S	NS
						40	S	L	L	S	S	NS	S	
						60	L	L	L	L	S		L	
						80		NS			L			
						100								
					37,5	20	S	L	L	S	S	NS	S	NS
						40	S	L	L	S	S		S	
						60	L	L	L	L	S		L	
						80		NS			L			
						100								
204	Hydrochloric acid, dry gas	7647-01-0			tg-g	20	S	S			S	NS	S	
						40	L	L			S	NS	L	
						60	NS	NS			S		NS	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
205	Hydrochloric acid, wet gas	7647-01-0			tg-g	20	S	S			S	NS	S	
						40	L	L			S	NS	L	
						60	NS	NS			S		NS	
						80								
						100								
206	Hydrocyanic acid	74-90-8	-15	25	Sat. sol.	20	S	S	S	S	S	NS	S	NS
						40	L	L	S	S	S		L	
						60	NS	NS	S	L	S		NS	
						80					L			
						100								
					10	20	S	S	S	S	S	NS	S	NS
						40	S	S	S	S	S		S	
						60	S	S	S	L	S		S	
						80		L			L		NS	
						100		NS						
					tg-l	20	S	S	S	S	S	NS	S	
					tg-g	40	L	L	S	S	S		L	
						60	NS	NS	S	L	S		NS	
						80								
						100								
207	Hydrofluoric acid	7664-39-3	-85	20	Up to 10	20	S	S	S	L	L	NS	S	
						40	S	S	S	L	L	NS	S	
						60	S	L	L	L	L		S	
						80		L			L			
						100		L						
					40	20	S	S	S	L	L	NS	S	NS
						40	S	S	L	L	L		S	
						60	L	L	L	NS	NS		L	
						80								
						100								
					48	20	S	L	L	NS	L	NS	S	NS
						40	L	NS	L		L		L	
						60	L		NS		NS		L	
						80								
						100								
					50	20	S	L	L	NS	L	NS	S	NS
						40	L	NS	L		NS	NS	L	
						60	L		NS		NS		L	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
207	Hydrofluoric acid (cont'd)	7664-39-3	-85	20	60	20	S	L	L	NS	L	NS	S	NS
						40	L	NS	NS	NS	NS		L	
						60	L	NS	NS	NS	NS		L	
						80								
						100								
					70	20	S	L	L	NS	L	NS	S	NS
						40	L	NS	NS	NS	NS		L	
						60	L	NS	NS	NS	NS		L	
						80								
						100								
208	Hydrofluoric acid, gas	7664-39-3			tg-g	20	NS	NS	NS	L	L	NS	NS	
						40				NS				
						60				NS				
						80								
						100								
209	Hydrogen	1333-74-0			tg-g	20	S	S	S	S	S	S	S	S
						40	S	S	S	S	S	L	S	S
						60	S	S	S	S	S		S	S
						80		L						S
						100		NS						
210	Hydrogen peroxide	7722-84-1	1	158	Up to 10	20	L	S	S	S	L	L	L	L
						40	L	L	L	S	L	L	L	L
						60	L	L	L	L	L		L	L
						80		L						
						100								
					30	20	L	L	L	S	L	NS	L	NS
						40	L	L	L	S	L		L	NS
						60	L	L	L	L	L		L	NS
						80								
						100								
					50	20	L	L	NS	L	L	NS	L	NS
						40	L	L	NS	L	L		L	NS
						60	NS	L	NS	L	L		NS	NS
						80								
						100								
					70	20	L	L	NS	L	L	NS	S	NS
						40	L	NS	NS	L	NS			
						60	NS	NS	NS	L				
						80								
						100								

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Full document details: PD ISO/TR 10358:2021

No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
211	Hydrogen phosphide (see 294)													
212	Hydrogen sulphide, aqueous	7783-06-4			Dil. sol.	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S		S	
						60	L	S	S	L	S		L	
						80		L			L			
						100								
					Sat. sol.	20	S	S	S	S	S	NS	S	L
						40	S	S	S	S	S		S	
						60	L	S	S	L	S		L	
						80		L			L			
						100								
					tg-g	20	S	S	S	S	S	NS	S	
						40	S	S	S	S	S		S	
						60	L	S	S	L	S		L	
						80		L			L			
						100								
213	Hydrogen sulphide, dry gas	7783-06-4		-61	tg-g	20	S	S	S	S	S	L	S	L
						40	S	S	S	S	S	L	S	
						60	L	S	S	L	S		L	
						80		L			L			
						100		NS						
214	Hydroquinone	123-31-9	170	286	Sat. sol.	20	S	S	S	S	S	L	S	S
				(730 mm)		40	L	L	L	S	L	L	L	S
						60	L	L	L	L	NS		L	S
						80								
						100								
215	Hypochlorous acid	7790-92-3			Sat. sol.	20	L	L	L	S	L	NS	L	
						40	NS	NS	L	S	L		NS	
						60	NS	NS	NS	L	L		NS	
						80								
						100								
					70	20	L	L	L	S	L	NS	L	
						40	NS	NS	L	S	L		NS	
						60	NS	NS	NS	L	L		NS	
						80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
216	Iodine (in potassium iodine)				Sat. sol.	20	NS	NS	NS	NS	NS	NS	NS	NS
						40	NS	NS		NS		NS	NS	
						60	NS	NS		NS			NS	
						80		NS						
						100		NS						
217	Iodine, in alcohol	7553-56-2	114	183	Work. sol.	20	NS	L	L	NS	NS	NS	NS	
						40	NS	L	L	NS		NS	NS	
						60	NS	L	NS	NS		NS	NS	
						80								
						100								
218	Isobutyl alcohol	78-83-1	-108	108	tg-l	20	S	S	S	S	NS	L	S	
						40	S	S	S	L		NS	S	
						60	L	L	L	L			L	
						80								
						100								
219	Isobutyronitrile	78-82-0		107	tg-l	20	L	L	L	NS	NS	NS	L	
						40	L	L					L	
						60	NS	NS					NS	
						80								
						100								
220	Isooctane	26635-64-3		99	tg-l	20	S	L	L	S	S	L	S	S
						40	L	L	NS	L	L	NS	L	S
						60	L	L		NS	NS		L	L
						80								L
					tg-g	100								
221	Isopropyl acetate	108-21-4	-73	90	tg-l	20	S	S	S	NS	NS	NS	S	
						40	L	L	L	NS			L	
						60	L	L		NS			L	
						80								
					tg-g	100								
222	Isopropyl alcohol	67-63-0	-90	82	tg-l	20	S	S	S	S	NS	L	S	L
						40	S	S	S	L	NS		S	L
						60	S	S	S	L	NS		S	L
						80		S						
					tg-g	100		S						
223	Isopropyl ether	108-20-3	-60	68	tg-l	20	L	L	L	NS	NS	NS	L	S
						40	L	NS	NS	NS			NS	
						60	NS	NS	NS	NS			NS	
					tg-g	80								
						100								

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No.	Chemical	CAS Nr.	m.p.°C	b.p.°C	Concentration %	*T* °C	PE	PP	PB	PVC-U	PVC-C	ABS	PE-X	PA-U
224	Kerosene	8008-20-6		150 to 250	Work. sol.	20	S	L	L	L	L	L	S	S
						40	L	L	NS	L	L		L	S
						60	L	L	NS	L	NS		L	L
						80		NS						
						100		NS						
225	Lactic acid	50-21-5	18	119	10	20	S	S	S	S	S	L	S	S
				(12 mm)		40	S	S	S	L	L		S	L
						60	S	S	S	L	L		S	L
						80		S			L			L
						100		L						
					28	20	S	S	S	S	S	L	S	S
						40	S	S	S	L	L		S	L
						60	S	S	S	L	L		S	L
						80		S			L			L
						100		L						
					90	20	S	S	S	L	S	NS	S	S
						40	S	S	L	L	S		S	L
						60	S	S		NS	S		S	L
						80								L
						100								
					tg-l	20	S	S	S	L	L	NS	S	S
						40	S	L	L	L	L		S	L
						60	S	L		NS	L		S	L
						80								L
						100								
226	Lanolin	8006-54-0			Work. sol.	20	S	S	S	L	NS	L	S	S
						40	L	S	L	L		L	S	
						60	L	L					S	
						80								
						100								
227	Lauryl chloride	112-52-7	-25	243	Sat. sol.	20	L	L	L	NS	NS	L	L	
						40	L	L	L			L	L	
						60	NS	NS	L				NS	
						80								
						100								
228	Lead acetate	6080-56-4	75		Dil. sol.	20	S	S	S	S	S	S	S	
						40	S	S	S	S	S	S	S	
						60	S	S	S	S	S		S	
						80		L			S			
						100		L						

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