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Packaging — Transport packaging for dangerous goods — Plastics compatibility testing

Emballages — Emballages pour le transport des marchandises dangereuses — Essais de compatibilité des matières plastiques

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 16101 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 122, *Packaging*, Subcommittee SC 3, *Performance requirements and tests for means of packaging, packages and unit loads*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

Contents

Foreword

This document (EN ISO 16101:2004) has been prepared by CEN /TC 261, "Packaging", the secretariat of which is held by AFNOR, in collaboration with ISO/TC 122 "Packaging".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports the objectives of the framework Directives on Transport of Dangerous Goods.

This European Standard has been submitted for reference into the RID and/or in the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This standard was developed to provide requirements and test procedures to meet the compatibility provisions for plastics packagings to contain liquids as set out in:

> The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (covering most of Europe) [2] and
>
> Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) (covering most of Europe, parts of North Africa and the Middle East) [5].

This procedure is an alternative option to that set out in the UN Recommendations on the Transport of Dangerous Goods [1].

Plastics packaging material can be attacked by the chemical contents of the package. Such effects are caused by different mechanisms such as environmental stress cracking (ESC) chemical degradation and swelling.

The UN Recommendations and the associated modal regulations require that all packagings shall be assessed for compatibility with the substances which they are to contain. The UN text makes special reference to plastics packagings for liquids. The procedure therein contains details of testing for six months at ambient temperature with the liquid to be carried. RID/ADR permits as an alternative the use of standard liquids to which this document refers.

The UN Recommendations are given legal entity not only to ADR and RID but also to:

> The International Civil Aviation Organisations Technical Instructions for the SafeTransport of Dangerous Goods by Air (ICAO Tis) (worldwide) [3] and
>
> The International Maritime Dangerous Goods Code (IMDG Code) (worldwide) [4].

These two modal rules do not refer to the standard liquid tests but they may still be acceptable as the UN provisions do not make the six month test a mandatory requirement.

The application of this standard will need to take account of the requirements of these international agreements and the relevant national regulations [6] [7] for domestic transport of dangerous goods.

Although not stipulated in the UN Recommendations or the modal regulations, these tests may be applied, where deemed appropriate, to inner packagings of combination packagings. However, for this purpose, the standard liquid tests may not be applicable to all types of plastics materials, since the tests were originally created for high molecular weight high density polyethylene (PE-HD-HMW).

WARNING — The use of this International Standard may involve hazardous materials and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This standard specifies the requirements and test methods for compatibility testing of polyethylene based plastics packagings and composite packagings with plastic inners containing liquids. The testing involves storage with the packaged substance, or with a standard liquid as defined in annex A. Annex B describes small scale laboratory tests, which may be used to determine the assimilation of those products to be carried with the standard liquids.

NOTE This standard should be used in conjunction with one or more of the International Regulations set out in the Bibliography

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing*

EN ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993)*

EN ISO 1133, *Plastics - Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:1997)*

EN ISO 1183-1, *Plastics - Methods for determining the density of non-cellular plastics – Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1:2004)*

EN ISO 1628-3, *Plastics - Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 3: Polyethylenes and polypropylenes (ISO 1628-3:2001)*

EN ISO 1872-2, *Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties (ISO 1872-2:1997)*

EN ISO 2818, *Plastics – Preparation of test specimens by machining (ISO 2818:1994)*

EN ISO 11403-3 *Plastics - Acquisition and presentation of comparable multipoint data - Part 3: Environmental influences on properties (ISO 11403-3:1999)*

EN ISO 11542-2:1998, *Plastics - Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 11542-2:1998)*

EN ISO 16104:2003, *Packaging – Transport packaging for dangerous goods – Test methods (ISO 16104:2002)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*

ISO 16770, *Plastics - Determination of environmental stress crack (ESC) of polyethylene – Full-notch creep test (FNCT)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
competent authority
any national regulatory body or authority designated or otherwise recognised as such for any purpose in connection with the regulations specified in the Bibliography

3.2
plastics packagings
drums, jerricans and composite packagings with inner plastics receptacle made from certain types of plastics

NOTE Certain types of polyethylene are listed in **A.3.**

3.3
packaged substance (chemical product)
dangerous liquid with which the packaging is to be filled for transport

NOTE Packagings used for solid packaged substances, which can become liquid at temperatures encountered during transport, should also meet the requirements of packagings for liquids.

3.4
standard liquids
defined liquids that are representative in their effect for a specific kind of interaction between a packaged substance and the plastics packaging

NOTE A full description of the standard liquids can be found in **A.2.**

4 Test requirements

4.1 General

Plastics packagings selected in accordance with clause **5** shall be conditioned with the packaged substance or a standard liquid with which it is to be assimilated. Annex C contains a list of substances assigned to standard liquids

For other chemicals not listed in annex C, small scale laboratory tests (see annex B) shall be used to prove assimilation with standard liquids. The standard liquid chosen shall be at least as aggressive as the substance to be transported. Where the packaged substance to be filled cannot be assimilated with one of the standard liquids, the packaged substance itself shall be used and its specification recorded. In the event that the effect is more aggressive than that of the standard liquids, the six month procedure shall be followed, as given in **7.2**, or alternatively, and with the exception of nitric acid > 55%, the accelerated procedure, as given in **7.3**.

NOTE When the standard liquid is water, proof of chemical compatibility is not required.

4.2 Conditioning

Plastics packagings shall be conditioned in accordance with clause **7** of this standard.

4.3 Post-conditioning inspection

At the end of the conditioning period the packagings shall be inspected for leakage. Where no leakage is apparent testing in accordance with clause **7** of EN ISO 16104:2003 shall commence within 21 days of the end of the conditioning period (see **7.4**).

4.4 Drop test

When tested in accordance with **7.1** of EN ISO 16104:2003, the plastics packaging:

a) shall be leakproof, subsequent to any slight discharge that may be apparent at the moment of impact and subsequent to the equalization of internal and external pressures (except for inner packagings of combination packagings, when it is not necessary for the pressure to be equalized);

b) shall not exhibit any damage liable to affect safety during transport, for example if the package cannot be used without leaking.

4.5 Stacking test

When tested in accordance with **7.2** of EN ISO 16104:2003, the packaging shall not:

a) show any sign of leakage ;

b) show any deterioration which could adversely affect transport safety, nor any distortion liable to reduce its strength or stability in stacks of packages.

4.6 Leakproofness test

When tested in accordance with **7.3** of EN ISO 16104:2003, plastics packagings shall be leakproof.

4.7 Hydraulic pressure test

When tested in accordance with **7.4** of EN ISO 16104:2003, plastics packagings shall be leakproof.

4.8 Permeability testing

With the exception of composite packagings having a plastics receptacle with outer steel drum, when tested in accordance with **8** of this standard, plastics packaging shall have a permeability not exceeding 0,008 g/l.h.

4.9 Equivalent testing

The test methods described in this standard shall be considered to be the reference test methods.

NOTE Alternative methods may be used to demonstrate compliance with relevant regulations provided that:

- their equivalency to the reference test method can be demonstrated;

- their use is recorded in the test report;

- prior approval is obtained from the competent authority.

4.10 Test report

All packaging tests in conformity with this standard shall be the subject of a test report prepared in accordance with annex E of EN ISO 16104:2003. It shall be possible to specifically identify the packaging relative to each test report, either by the retention of uniquely numbered specimens or by inclusion of sufficient photographs and/or drawings with unique references.

5 Selection and preparation of test packagings

5.1 Selection of packagings

A minimum of 15 packagings of each design type (or 18 in the case of a requirement to carry out the tests in **8**), for each chemical to be tested, shall be selected at random from normal production and submitted for testing.

NOTE 1 For box shaped composite packagings a different number of samples, 14 or 17, may be required.

Packagings shall be:

a) at least 48 h old;

b) marked with a test reference number which shall also be entered on the test record and later used on the test report;

c) individually weighed to establish the tare or the filled mass;

NOTE 2 The form of such weighing may be varied to fit in with whether the packagings have been supplied full or empty to the test station. Where the masses of individual empty packagings are recorded, it is necessary to record only a typical filled mass (or vice-versa).

d) examined for damage etc. which might invalidate the tests;

NOTE 3 The tests set out below should be applied to every design type of packaging, by polymer type and grade.

NOTE 4 For selective testing see EN ISO 16104:2003, annex F.

NOTE 5 For testing with a lesser number of packagings see EN ISO 16104:2003, **4.1** NOTE.

5.2 Information to be provided with packagings

Each packaging type shall be accompanied by specification(s) for that design type (in the appropriate format set out in annex G of EN ISO 16104:2003 and by the following additional information as relevant.

The packaging user (with the assistance, where appropriate, of the packaging manufacturer and the test laboratory) shall identify the packaged substance. In the first instance this process shall consist of identifying the plastics material concerned and its possible interactions, such as swelling, environmental stress cracking (ESC), and molecular degradation.

NOTE 1 The specification forms for plastics packagings should identify the material by polymer type and grade.

NOTE 2 Where tests are carried out using the packaged substance the test report may be applicable for other substances having equivalent or lesser chemical effects.

5.3 Filling of packaging prior to testing

5.3.1 Determination of brimful capacity

A packaging intended to contain liquids shall be filled to not less than 98% of the brimful capacity. The brimful (overflow) capacity is determined for example by:

- weighing the empty packaging including closures (mass empty = *m* kg) and
- weighing the packaging full (mass m kgs brimful = W kg).

The packaging shall be filled with water until the water just overflows and then fitting the closure and any surplus mopped up. No steps shall be taken, e.g. by tilting or tapping the packaging, to enable water to penetrate into a hollow handle or other design feature above the closure.

$$b = \frac{W - m}{d}$$

where

b is the brimful capacity in litres

W is the mass of the packaging when brimful with water in kilograms (kg)

m is the mass of the empty packaging in kilograms (kg)

d is the density of water (1,0 kg/l)

NOTE When the brimful capacity has already been determined by testing to EN ISO 16104:2003, this procedure is not necessary.

5.3.2 Filling of packaging

Filling of packagings shall be carried out in accordance with the following:

a) The packaging shall be filled to not less than 98 % of the brimful capacity (see **5.3.1**).

b) When filling test packagings, at least one packaging shall have its capacity and filling level determined as in c). Further specimens of that design type may be filled using a dipstick calibrated on the first specimen or, in the case of small packagings, by mass or volume. When test specimens are filled by mass with a liquid other than water (e.g. anti-freeze solution), the density of that liquid shall be taken into account, in order to obtain the correct volume of fill (≥ 98 %). Determination shall be made of the total empty packaging mass including the closure(s). This facilitates calculation of stacking loads.

c) The calculation of required volume for testing shall be:

$$C = \frac{(W - m)x98}{100d}$$

where

C is the required volume of water in litres (l)

W is the mass of packaging when brimful with water in kilograms (kg)

m is the mass of the empty packaging in kilograms (kg)

d is the relative density of water (1,0 kg/l)

5.4 Closing packagings

Screw type closures shall be tightened to the torque recommended by the applicant where appropriate, which shall be recorded in the test report.

Closure torque shall not differ from one test to another in the test report. If it is necessary to revise a closure torque following a failure in one test, then all tests shall be completed using that torque setting.

All tests for a particular liquid shall be carried out at the same torque.

NOTE 1 The closure torque may vary for different seals.

NOTE 2 It is not necessary to apply the specified torque during the conditioning period if this affects the subsequent performance of the seal during the packaging testing.

Where vented closures are intended for use in the packaging they shall be fitted for testing. Packagings fitted with vented closures shall be inverted after closing and observed for leakage for a period of 5 min. Leakage from the closure vent shall be regarded as a failure. An alternative method of test instead of inversion is shown in Figure 1, clause 7.1.

6 Facilities for testing

6.1 General requirements

Tests shall be carried out at a testing facility capable of meeting the operational provisions of EN ISO/IEC 17025.

NOTE 1 This does not imply a requirement for the test laboratory to have attained third party certification or accreditation, but if appropriate such external approval may be obtained from either a national accreditation body or from the competent authority.

NOTE 2 Testing staff should have a knowledge of the principles of the dangerous goods regulations, as set out in the UN Recommendations.

6.2 Accuracy of measurement equipment

The accuracy of measuring equipment shall be more precise than the accuracy of the measurements in testing, as specified in **6.3**, unless otherwise approved by the competent authority. The measuring equipment shall be calibrated in accordance with the relevant provisions of EN ISO/IEC 17025.

6.3 Accuracy of measurements in testing

Measurement equipment shall be selected such that individual measurement results including errors in reading and calibration shall not exceed the following tolerances:

Mass in kilograms (kg):	± 2 %
Pressure in kilopascals (kPa):	± 3 %
Distance / length in millimetres (mm):	± 2 %
Temperature in degrees Celsius (ºC):	± 1 °C
Humidity in percentage (%):	tolerances are as specified in particular test methods
Time in minutes (min):	± 3 %
Torque in newton·metres (N·m):	± 3 N m or 10 %, whichever is the greater

NOTE For some measurements, the tolerances may be lower in order to have meaningful measurements e.g. when measuring masses or dimensions of empty packagings.

Where only maximum or minimum values are specified in the text, tolerances are one sided e.g. in **7.3** the conditioning temperature may exceed 40°C, but shall not be less.

6.4 Climatic conditions

There shall be adequate climatic facilities to meet the requirements in Table 1 of EN ISO 16104:2003.

6.5 Impact surfaces for drop tests

The drop test area shall be horizontal and flat, massive enough to be immovable and rigid enough to be non-deformable under test conditions and sufficiently large to ensure that the test package falls entirely on the surface.

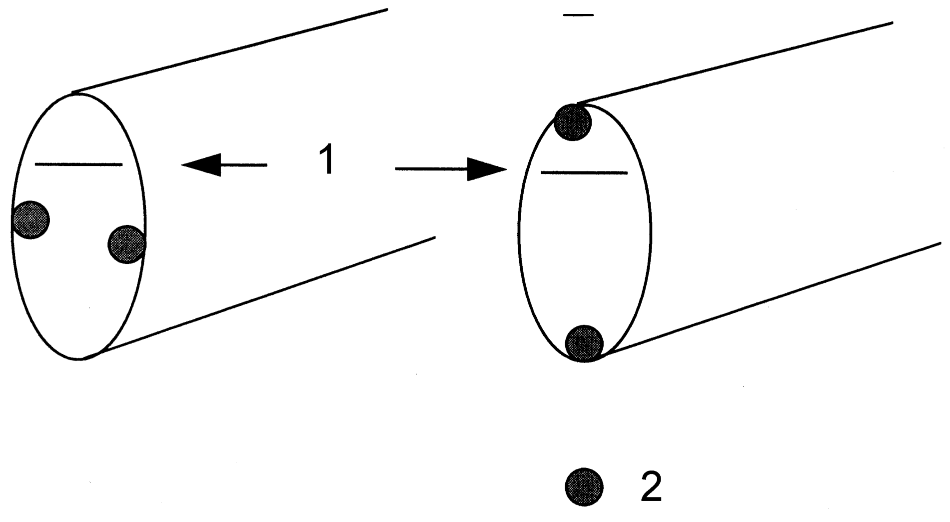
7 Conditioning procedures

7.1 General

After filling, the packagings shall be inverted for 24 h (unless fitted with a vented closure, see following), and then restored to the normal standing position. For the last 24 h of the conditioning period as defined in **7.2** and **7.3**, the packagings shall be inverted again.

For packagings that have vented closures, invert the packagings for a period of 5 min after filling and then restore the packagings to their normal standing position. At the end of the conditioning period, invert the packagings again for a period of 5 min.

NOTE As an alternative to complete inversion the packaging may be laid on its side such that all closures are below the level of the substance being tested (see Figure 1).



Acceptable

Unacceptable

Key

1 Liquid level
2 Closure

Figure 1 — Explanatory diagram of alternative inversion method

7.2 Six months ambient conditioning

This test shall be carried out at ambient temperature for a period of 6 months.

For the purposes of this standard, ambient temperature, which shall be monitored and recorded, is considered to be not less than 15 °C.

NOTE The competent authority may, however, allow an extended period of test for temperatures below 15 °C.

7.3 Accelerated conditioning procedure

The packagings for test shall be conditioned for 21 days at a minimum of 40 °C with each standard liquid required.

The procedure shall be applied for polyethylene types as defined in the **A.3.1** and **A.3.2**. For other types of polyethylene such as those defined in **A 3.3** and **A.3.4**, the approval of the competent authority shall be obtained

7.4 Procedure at the end of the conditioning period

At the end of the conditioning period, all packagings, except those intended to withstand the stack test, shall be emptied, rinsed, inspected for damage and prepared for test in accordance with the test procedures for plastics packagings for liquids (EN ISO 16104). Testing shall commence within 21 days of the end of the conditioning period. If emptied the packaging shall be kept closed until testing commences.

Packagings which have been conditioned with standard liquid, n-butyl acetate, shall be emptied and refilled with a mixture of 1 %–10 % aqueous wetting agent solution and 2 % of n-butyl acetate for the stacking test.

NOTE 1 Where the closure elements (for example heat or induction seals) would have to be destroyed to empty the packaging after conditioning; the packaging should be emptied through an additional opening drilled into the package. Such an opening should not affect the results of the other tests (drop, hydraulic pressure and leakproofness tests).

NOTE 2 This does not apply to composite packagings where the outer non-plastics packaging withstands the stacking load, e.g. steel.

NOTE 3 For substances presenting a danger at 40°C it may be necessary to replace the filling substance by another substance where at least the same chemical interaction has been demonstrated and the agreement of the competent authority has been obtained.

The same closures and gaskets used during the conditioning of the packagings shall be used for the rest of the tests; i.e. gaskets and closures shall not be replaced.

7.5 Reuse of standard liquids

The standard liquids shall be checked periodically in accordance with Table 1 as their effectiveness can be reduced over a period of time.

Table 1 — Reuse of standard liquids

Standard Liquid	Specification
Wetting solution	New solution for each test or check surface tension (see annex A)
Acetic acid	Concentration 99 ± 1%
Normal butyl acetate	≥ 98 % a)
Mixture of hydrocarbons	16%–21% aromatic content a)
Nitric acid	Concentration ≥ 55 %

a) It is recommended that the absorption of these standard liquids is periodically checked with a control specimen of polyethylene of defined type and grade, in accordance with **B.4.1** The used standard liquid is no longer fit for purpose when the determined absorption deviates by more than 5 % from the original determined value.

Tests to monitor the quality of the standard liquids shall be done by appropriate means at intervals according to the frequency of usage.

8 Permeability testing

8.1 Applicability

This test is required only for packagings for benzene, toluene, xylene or mixtures and preparations containing those substances.

8.2 Test preparation

Three packagings shall be preconditioned according to **7.2** of this standard for original filling substance or according to **7.3** of this standard for the standard liquid mixture of hydrocarbons (white spirit).

8.3 Test procedure

The test specimens shall be filled with the packaged substance or standard liquid mixture of hydrocarbons (white spirit) and weighed before and after storage for 28 days at 23°C and 50% relative atmospheric humidity.

NOTE Equivalent procedure at 40°C - this test may be done in conjunction with the accelerated conditioning procedure **7.3** with standard liquid mixture of hydrocarbons (white spirit).

Annex A
(normative)

Standard liquids and applicability to polyethylene types

A.1 Introduction

The standard liquid system has been developed for the investigation of the compatibility of high molecular weight high density polyethylene, but it can also be applied to medium molecular weight polyethylene and to packagings produced from the above polyethylene types where the surface or surfaces have been fluorinated.

NOTE When closures or closure elements are manufactured from materials other than those referred to in **A.3**, alternative suitable methods to investigate compatibility may be employed.

A.2 Definitions and applicability of standard liquids

A.2.1 Wetting solution

Wetting solution shall be used for substances causing severe cracking in polyethylene under stress, in particular for all solutions and preparations containing wetting agents.

An aqueous solution of (1–10)% of a wetting agent shall be used. The surface tension of this solution shall be (31–35) mN/m at 23 °C.

The stacking test shall be carried out on the basis of a relative density of not less than 1,2.

If adequate chemical compatibility is proved with a wetting solution, a compatibility test with acetic acid is not required.

NOTE In the case of filling substances, however, which cause polyethylene to stress crack more than wetting solution, adequate chemical compatibility may be proved after preliminary storage for 21 days at 40 °C in accordance with **7.3** of this standard, using the original filling matter.

A.2.2 Acetic acid

Acetic acid shall be used for substances and preparations causing cracking in polyethylene under stress, in particular for monocarboxylic acids and monovalent alcohol, acetic acid of (98–100) % concentration shall be used with a relative density = 1,05.

The stacking test shall be carried out on the basis of a relative density not less than 1,1.

NOTE In the case of filling substances causing polyethylene to swell more than acetic acid and to such an extent that the polyethylene mass is increased by up to 4 %, adequate chemical compatibility may be proved after preliminary storage for 21 days at 40 °C, in accordance with **7.3**, using the original filling matter.

A.2.3 Normal butyl acetate

Normal butyl acetate and normal butyl acetate-saturated wetting solution shall be used for substances and preparations that cause polyethylene to swell to such an extent that the polyethylene mass is increased by up to 4 % and at the same time causes cracking under stress, in particular for phyto-sanitary products, liquid paints and esters.

Normal butyl acetate of (98–100) % concentration shall be used for preliminary storage in accordance with **7.3**.

For the stacking test, in accordance with **4.5** of this standard, a test liquid consisting of a (1–10) % aqueous wetting solution conforming to **A.2.1** shall be used mixed with 2 % normal butyl acetate.

The stacking test shall be carried out on the basis of a relative density not less than 1,0.

NOTE In the case of filling substances causing polyethylene to swell more than normal butyl acetate and to such an extent that the polyethylene mass is increased by up to 7,5 %, adequate chemical compatibility may be proved after preliminary storage for 21 days at 40 °C, in accordance with **7.3** using the original filling matter.

A.2.4 Mixture of hydrocarbons (white spirit)

Mixture of hydrocarbons (white spirit) shall be used for substances and preparations causing polyethylene to swell, in particular for hydrocarbons, esters and ketones.

A mixture of hydrocarbons having a boiling range of (160–220) °C, a relative density of 0,78–0,80, a flash point above 50 °C and an aromatics content of (16–21) % shall be used.

The stacking test shall be carried out on the basis of a relative density of not less than 1,0.

NOTE In the case of filling substances causing polyethylene to swell to such an extent that the polyethylene mass is increased by more than 7,5 %, adequate chemical compatibility may be proved after preliminary storage for 21 days at 40 °C, in accordance with **7.3** using the original filling matter.

A.2.5 Nitric acid

Nitric acid shall be used for all substances and preparations having an oxidizing effect on polyethylene and causing molecular degradation identical to or less than 55 % nitric acid.

Nitric acid in a concentration of not less than 55 % shall be used.

The stacking test shall be carried out on the basis of a relative density of not less than 1,4.

In the case of filling substances more strongly oxidizing than 55 % nitric acid or causing degradation of the molecular mass, proceed in accordance with **7.2**.

A.2.6 Water

Water for substances which do not attack polyethylene in any of the cases referred to under **A 2.1** to **A 2.5**, in particular for inorganic acids and lyes, aqueous saline solutions, polyvalent alcohols and organic substances in aqueous solution.

The stacking test shall be carried out on the basis of a relative density of not less than 1,2.

If the testing has been carried out satisfactorily with at least one of the aqueous based standard liquids, wetting solution or 55 % nitric acid, it is not necessary to carry out the testing with water, for the same test levels (Packaging Group, relative density, hydraulic pressure).

A.3 Definitions of polyethylene types

A.3.1 High molecular weight high density polyethylene (PE-HD-HMW)

The natural relative (non-pigmented) density at 23 °C after annealing at 100 °C for 1 h shall be ≥ 0,940 g/cm^3 in accordance with EN ISO 1183-1.

The melt flow rate at 190 °C per 21,6 kg load shall be ≤ 12 g per 10 min in accordance with EN ISO 1133.

A.3.2 Medium molecular weight high density polyethylene (PE-HD-MMW)

The natural relative (non-pigmented) density at 23 °C after annealing at 100 °C for 1 h shall be ≥ 0,940 g/cm^3 in accordance with EN ISO 1183-1.

The melt flow rate at 190 °C per 2,16 kg load shall be ≤ 0,5 g per 10 min and ≥ 0,1 g per 10 min in accordance with EN ISO 1133.

or

The melt flow rate at 190°C per 5 kg load shall be ≤ 3,0 g per 10 min and ≥ 0,5 g per 10 min in accordance with EN ISO 1133.

A.3.3 Cross-linked polyethylene (PE-X)

PE-X is polyethylene having a changed chemical structure in which the major proportion of polymer chains are chemically connected with each other to form a three-dimensional network.

A.3.4 Linear medium density polyethylene

The natural relative (non-pigmented) density at 23° after annealing at 100°C for 1 h shall be ≥ 0,927 g/cm^3 and ≤ 0,937 g/cm^3 in accordance with EN ISO 1183-1.

The melt flow rate at 190°C per 2,16 kg load shall be ≥ 5,0 g per 10 min and ≤ 10,0 g per 10 min in accordance with EN ISO 1133

Annex B
(normative)

Small scale laboratory tests to assess packaged substances against standard liquids

B.1 Introduction

The small scale laboratory tests listed as follows shall be used to assess whether a packaged substance can be assimilated to a standard liquid for specific grades of polyethylene (high molecular weight high density polyethylene and medium molecular weight high density polyethylene, additionally cross-linked polyethylene and linear medium density polyethylene).

For the cross linked polyethylene and linear medium density polyethylene the prior agreement of the competent authority shall be obtained.

Three tests cover specific interactions between the packaged substance and the plastics material. These are:

- Method A: absorption (one procedure);
- Method B: environmental stress cracking (three procedures);
- Method C: molecular degradation (three procedures).

NOTE Where alternative procedures are described each procedure may be regarded as equivalent.

B.2 Requirements

B.2.1 Resistance to absorption (swelling)

For Method A (**B.4.1**) the percentage weight increase when tested with the packaged substance to be carried shall be equal or less than that figure obtained when tested with the applicable standard liquid.

B.2.2 Resistance to environmental stress cracking

For Procedure B1 (**B.4.2.2**), the results shall demonstrate that with the packaged substance there is a lesser or equal effect than with the standard liquid used as a control.

For Procedure B2 (**B.4.2.3**) and Procedure B3 (**B.4.2.4)** the results shall demonstrate that with the packaged substance there is a time interval to failure equal to or greater than with the standard liquid used as a control.

B.2.3 Resistance to molecular degradation

For Procedure C1 (**B.4.3.3**) the melt flow rate of the specimen of the material in contact with the packaged substance shall not exceed that of the same material in contact with 55% nitric acid.

For Procedure C2 (**B.4.3.4**) the viscosity number of the sample of the material in contact with the packaged substance shall not be less than that of the same material in contact with 55 % nitric acid.

For Procedure C3 (**B.4.3.5**) the elongation at break of the sample in contact with the packaged substance shall not be less than that with the same material with 55 % nitric acid.

B.2.4 Test report

A test report shall be prepared. The report shall include a full description of the packaged substance under test and the plastics material.

B.3 Selection and preparation of test specimens

B.3.1 A representative complete packaging (at least 48 h old) shall be supplied to the testing laboratory. Test specimens shall be prepared from material cut from this packaging.

NOTE By agreement with the competent authority the tests may also be carried out on test specimens prepared from compression moulded or extruded sheet produced from a specific polymer grade and specified thickness.

B.3.2 Each test specimen shall have a means of identification.

B.3.3 Each test specimen shall be examined for damage etc. which could invalidate the tests, e.g. surface imperfection or contamination.

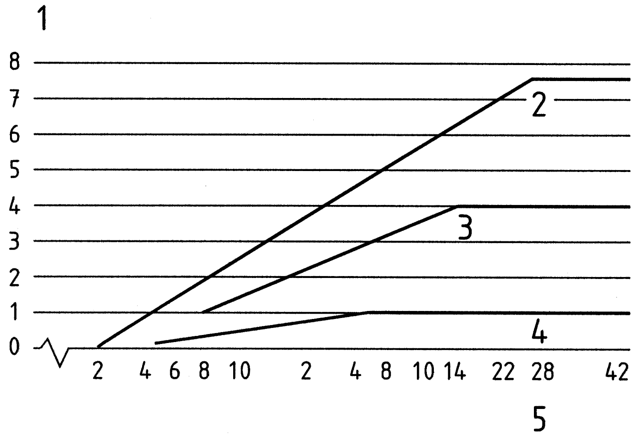
B.3.4 For cross linked polyethylene, only test specimens taken from the packagings shall be used.

B.4 Test procedures

B.4.1 Resistance to absorption (Method A)

B.4.1.1 Principle

This method details the determination of the resistance to absorption of the plastics packaging when in contact with a packaged substance (See Figure B.1)



Key

1 Increase in mass due to swelling %
2 Mixture of hydrocarbons (white spirit)
3 Normal butyl acetate
4 Acetic acid
5 Storage period d

Figure B.1 — Determination of the absorption (increase in mass) of the samples immersed in the product at 40° C

B.4.1.2 At least three test specimens of area not less than 450 mm^2 shall be cut from the centre of the container side wall or from a compression moulded or extruded sheet.

B.4.1.3 The initial mass of each of the test specimens (W_o) shall be recorded.

B.4.1.4 The test specimens shall be kept fully immersed in the packaged substance in a suitable receptacle.

B.4.1.5 Test specimens shall be immersed until absorption is complete, i.e. constant mass is reached. For normal test conditions with specimen thickness 2,0 mm or less and test temperature 40°C, this is typically achieved within a test period of 28 days.

B.4.1.6 At the end of the test period or at appropriate test intervals remove the test pieces, remove all traces of surface liquid, and record the mass of each test piece (W_1).

B.4.1.7 Test specimens shall only be used once.

B.4.1.8 Results

The mean of three results to two significant figures shall be recorded.

- % mass increase $\Delta W = \frac{100\,(W_1 - W_o)}{W_o}$
- W_0 = initial mass;
- W_1 = mass at end of test period.

B.4.1.9 Criteria for assessment

The percentage mass increase, when tested with the packaged substance, shall be less than or equal to that obtained when tested with the appropriate standard liquid.

NOTE This can be expected to be:

- up to 1 % for water, wetting agent solution, acetic acid, or nitric acid;
- approximately 4 % for n-butyl acetate;
- approximately 7,5 % for mixture of hydrocarbons (white spirit).

B.4.2 Resistance to environmental stress cracking (method B)

B.4.2.1 General

One of the following three alternative procedures shall be used to determine environmental stress cracking:

i) pin impression test (see **B.4.2.2**)

ii) bent strip test (see **B4.2.3**)

iii) full notch creep test (see **B.4.2.4**)

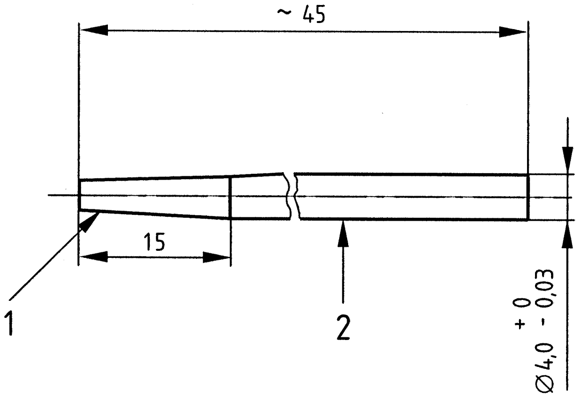
B.4.2.2 Pin impression test (Procedure B1)

B.4.2.2.1 Special equipment required for test

i) Polished pins, made from material resistant to the product under test, e.g. stainless steel, glass, as specified in Figure **B.2.**

ii) Tool, for notching specimen to the required dimensions, as shown in Figure B 3. The notch radius shall be ≤ 0,05 mm.

Dimensions in millimetres



Key

1 Gradient approximately 1: 10

2 Polished

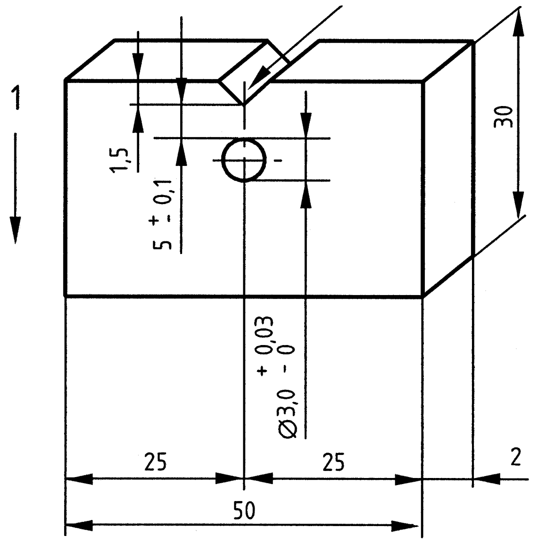
Figure B.2 — Polished pins for Pin Impression Test

B.4.2.2.2 Preparation of test specimens

Cut at least 70 specimens from a packaging, a compression moulded or extruded sheet. Each test specimen shall not be less than 50 mm long, 30 mm wide and 2 mm or greater in thickness. The test specimen shall be notched and a hole drilled (3 mm in diameter) in accordance with Figure B.3.

The distance between the bottom of the notch and the edge of the hole shall be (5 ± 0,1) mm or (4 ± 0,1) mm, the latter being used to shorten the testing time with certain grades of polyethylene.

Dimensions in millimetres



Key

1 Direction of extrusion

2 The 5 mm dimension may be 4 mm where appropriate, in which case the 1,5 mm dimension is increased to 2,5 mm

Figure B.3 — Test specimen for Pin Impression Test

B.4.2.2.3 Preconditioning procedure

Test specimens shall be immersed in both the packaged substance and the standard liquid for a period of 21 days at either (40 ± 1) °C or a higher specified temperature controlled to ± 1 °C, the latter being used to shorten the test time with certain grades of polyethylene.

NOTE Where it has been shown that this pre-conditioning effect has no effect on test liquids and assimilated products, this step may be eliminated.

B.4.2.2.4 Stress cracking test

An equal number of specimens shall be immersed in both the packaged substance and the standard liquid; normally this is wetting solution or acetic acid.

NOTE n-butyl acetate may be used where it is intended to show the combined effect of stress cracking and absorption. This depends on the results of Method A (see **B 4.1**).

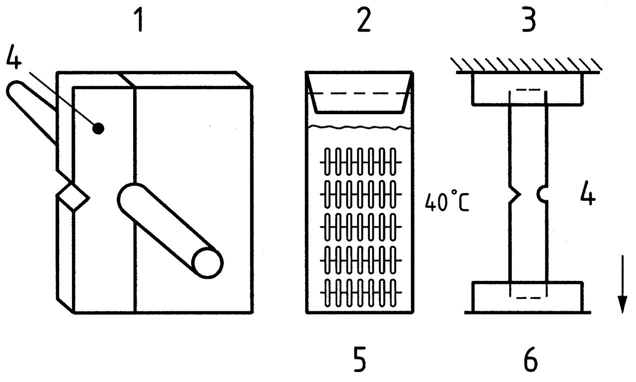
At the end of the storage period remove the test pieces, and put aside 10 specimens. Insert the polished pin (**B.4.2.2.1**) into the 3 mm hole in each of the remaining specimens. The pin shall penetrate the test piece until the parallel section of the pin is inserted into the hole.

Return these pinned pieces to the liquids and immerse as in **B 4.2.2.3**, except for n-butyl acetate where the stress cracking test is performed in a mixture of (1–10) % aqueous wetting agent solution mixed with 2 % n-butyl acetate (see **B.2.3**).

At appropriate intervals remove 10 pieces and allow to cool to room temperature. Remove the pins carefully. Cut each across the 3 mm hole parallel to the notched edge (see Figure B.4). Carry out a tensile test on the notched part of each of the test pieces no longer than 8 h after removal from the test liquid.

Determine the tensile strength in accordance with EN ISO 527-2 at (23 ± 2) °C with a testing speed of 20 mm/min.

Calculate the mean tensile strength of each set of test pieces. Graphically plot the residual tensile strength as a percentage of the tensile strength of the original10 test pieces which were put aside after pre-storage.



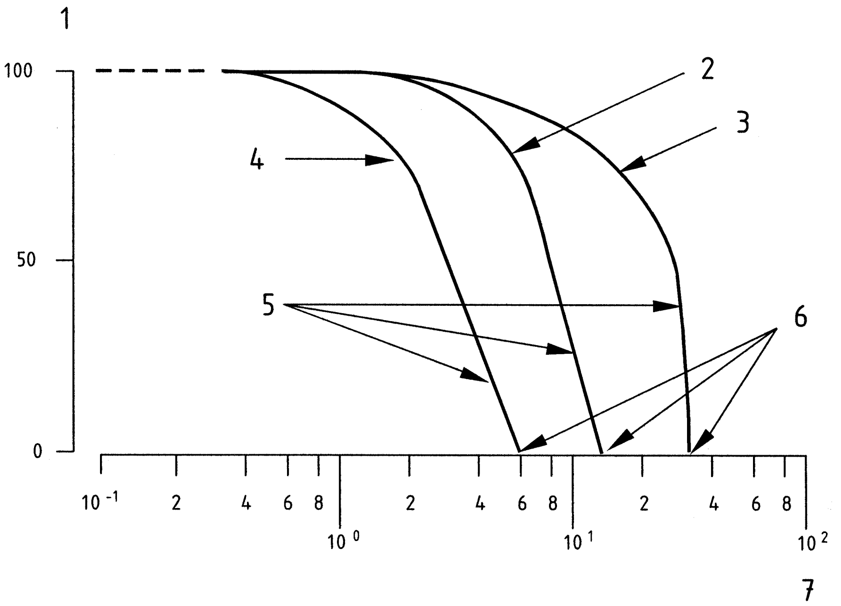
Key

1 Test sample with pin
2 Storage in filling substance
3 Tensile test
4 Test sample section A
5 40° C or 50° C where appropriate
6 Testing speed v = 20 mm/min

Figure B.4 — Pin Impression test: specimen preparation, storage and testing

B.4.2.2.5 Criteria for assessment

Compare the curves to determine whether the packaged substance has a stronger or weaker effect than the standard liquid, as shown e.g., in Figure B.5.



Key

1 Residual tensile strength σ $_{max}$ %
2 Standard liquid
3 Filling substance 2 (less aggressive than standard liquid)
4 Filling substance 1 (more aggressive than standard liquid)
5 Residual tensile strength curves
6 Time standing until test sample is cracked through
7 Storage period d

Figure B.5 — Pin Impression Test

An alternative visual method of assessment of specimen failure times may be used.

15 samples as in **B.4.2.2.2** are preconditioned as per **B.4.2.2.3** and subjected to the stress cracking method as in **B.4.2.2.4**. By visual checks the time for cracking is determined for each pinned test sample (the crack usually propagates from the tip of the notch to the pin). The criterion for assessment is based on the time for 8 of the 15 specimens in the standard liquid to have failed (T). For the packaged substance, this time shall not be less than T.

This alternative method may be used with the approval of the competent authority.

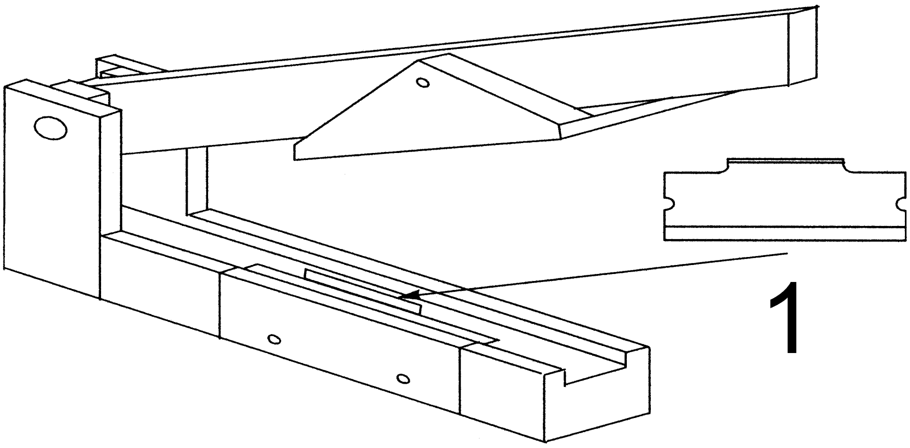
B.4.2.3 Bent strip test - 'Bell Telephone Test' (Procedure B2)

B.4.2.3.1 Principle

This procedure uses specimens with a controlled imperfection (notch) in accordance with ASTM D 1693-00.

B.4.2.3.2 Special equipment

Slot notching tool, transfer tool, bending tool, see Figures B.6, B.7 and B.8.



Key

1 Blade

Figure B.6 — Slot notching tool

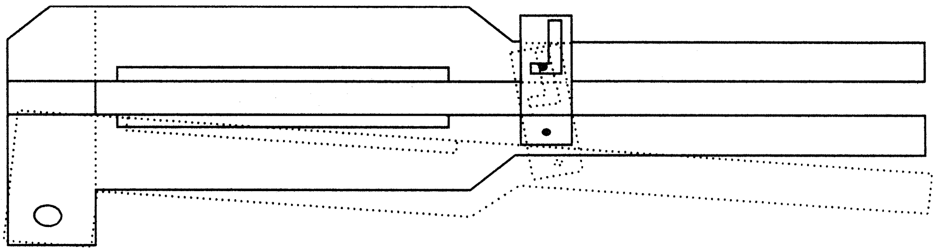
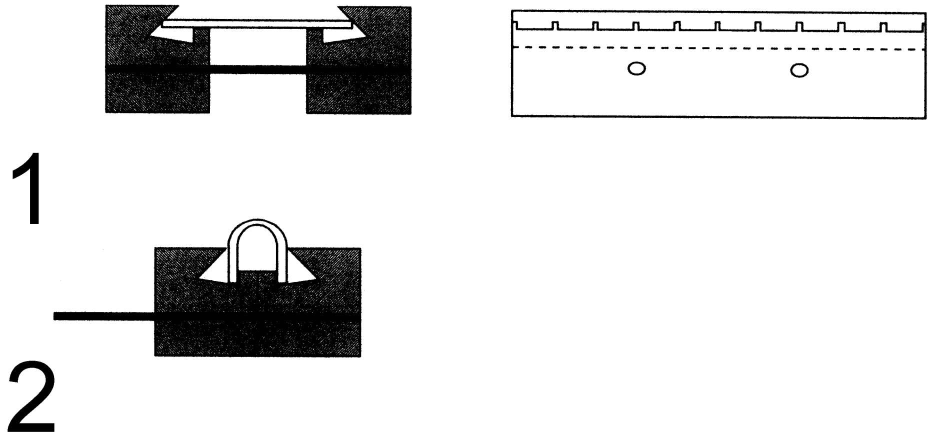


Figure B.7 — Transfer tool



Key

1 Clamp open with flat specimen

2 Clamp closed with bent specimen

Figure B.8 — Specimen bending tool

B.4.2.3.3 Preparation of test specimens

A suitable number of test specimens shall be cut from the packaging side wall, or from a compression moulded or extruded sheet. Test specimens cut from the container shall be subsequently compression moulded, using a specified moulding temperature and cooling rate in accordance with EN ISO 1872-2 method B.

The finished thickness shall be 1,875 mm ± 0,125 mm.

Cut out 10 test specimens of dimensions (38,0 ± 2,5) mm × (13,0 ± 0,8) mm from the moulded sheet with a sharp cutting die. Do not cut test specimens from within 10 mm of the edge of the moulded sheet. Check that all the test pieces are within the specified thickness tolerances.

Using a sharp blade and jig, notch each test specimen centrally over a length of 19,05 mm ± 0,15 mm and a depth of 0,35 mm ± 0,05 mm.

B.4.2.3.4 Pre-conditioning procedure

Immerse the test specimens in the product under evaluation for 21 days at 40 °C or a higher specified temperature controlled to ± 1,0 °C.

NOTE Where it has been shown that this pre-conditioning has no effect on test liquids and assimilated products, this step may be eliminated.

B.4.2.3.5 Stress cracking test

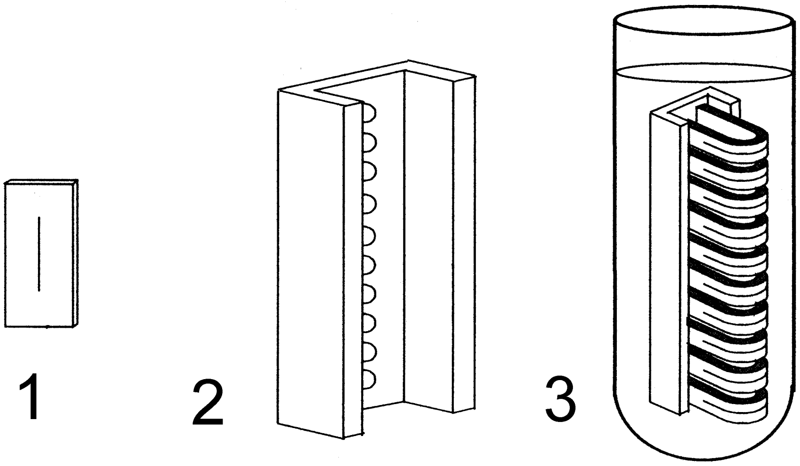
Place the test specimens, notch side upwards in a bending clamp and, using a vice, close the clamp over a period of approximately 30 s.

Using a transfer tool, carefully remove the test specimens from the clamp and place them in the specimen holder, a channel of length 165 mm, depth 10 mm, and internal width (11,75 ± 0,05) mm. Gently press down the test specimens to ensure that they are all firmly against the base of the channel, see Figure B.9.

Place the channel in a suitable receptacle and cover it with the product under evaluation. Store at a temperature of 40 °C or a higher specified temperature controlled to ± 1 °C.

Inspect each test piece at suitable test intervals (normally daily) and record as a failure any test piece that shows a visible defect, usually a crack running at right angles to the notch.

The test shall be terminated when all specimens have failed or after 1 000 h.



Key

1 Test specimen
2 Specimen holder
3 Specimens in test assembly

Figure B.9 — Bent Strip test: test specimen, holder and assembly

B.4.2.3.6 Criteria of acceptance

The time for 50 % of specimens to fail (*ƒ*50 value) in the packaged substance shall be ≥ *ƒ*50 in the standard liquid.

B.4.2.4 Full notch creep test (FNCT) (Procedure B3)

B.4.2.4.1 Principle

A test specimen in the form of square section bar with coplanar notches in each face at the centre is subjected to a static tensile load in a temperature controlled environment in accordance with ISO 16770. The geometry of the test specimen is such that plane conditions are obtained and brittle failure occurs under appropriate load and temperature conditions. The time for this brittle failure to occur after loading is recorded.

B.4.2.4.2 Terms and definitions

B.4.2.4.2.1
failure

generally complete separation of the two halves of the test specimen

B.4.2.4.2.2
brittle failure

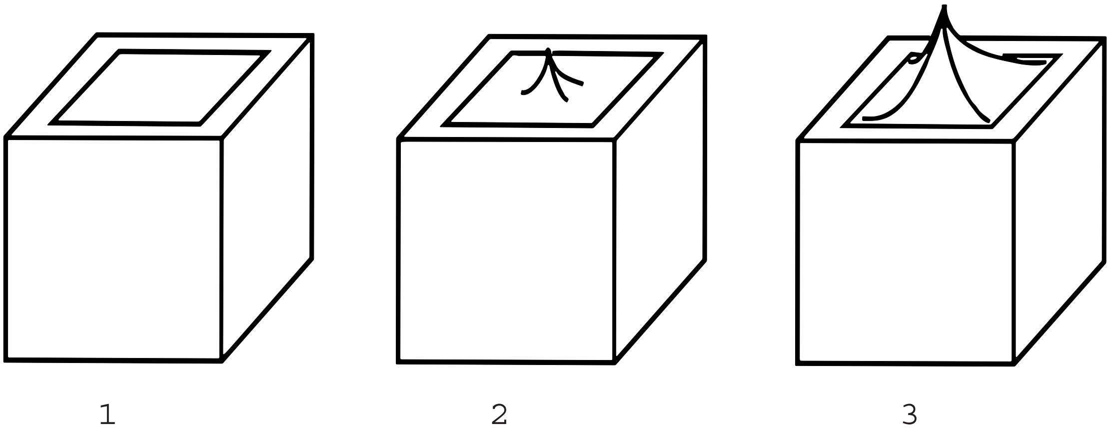
failure where the fracture surface exhibits no permanent material deformation to the naked eye e.g. stretching, elongation or necking down, see Figure B.10.1. In tougher materials an extended ligament may form in the centre, see Figure B.10.2

B.4.2.4.2.3
ductile failure

failure where the fracture surface clearly exhibits permanent material deformation with stretching, elongation and necking down, see Figure B.10.3

B.4.2.4.2.4
ligament area

remaining cross sectional area after notching



Key
1 Brittle
2 Brittle
3 Ductile

Figure B.10 — Fracture surfaces

B.4.2.4.3 Apparatus

B.4.2.4.3.1 Loading device

A suitable device for applying the load is a lever arm loading machine with an arm ratio between 4:1 and 10:1. A typical example of such a device is shown in Figure B.11. The lever arm ratio R is equal to L1/L2. When the lever arm is fitted with the top specimen grip and the weight carrier it shall be horizontal i.e. balanced.

The specimen grips shall be designed to prevent slippage of the test specimen and ensure that the load is transmitted axially through the test piece e.g. via a low friction universal coupling to prevent bending of the test specimen during the test. A typical test specimen grip assembly is shown in Figure B.12.

In addition to the above example, the tensile load may be applied directly using dead weights or any other means for producing a constant load.

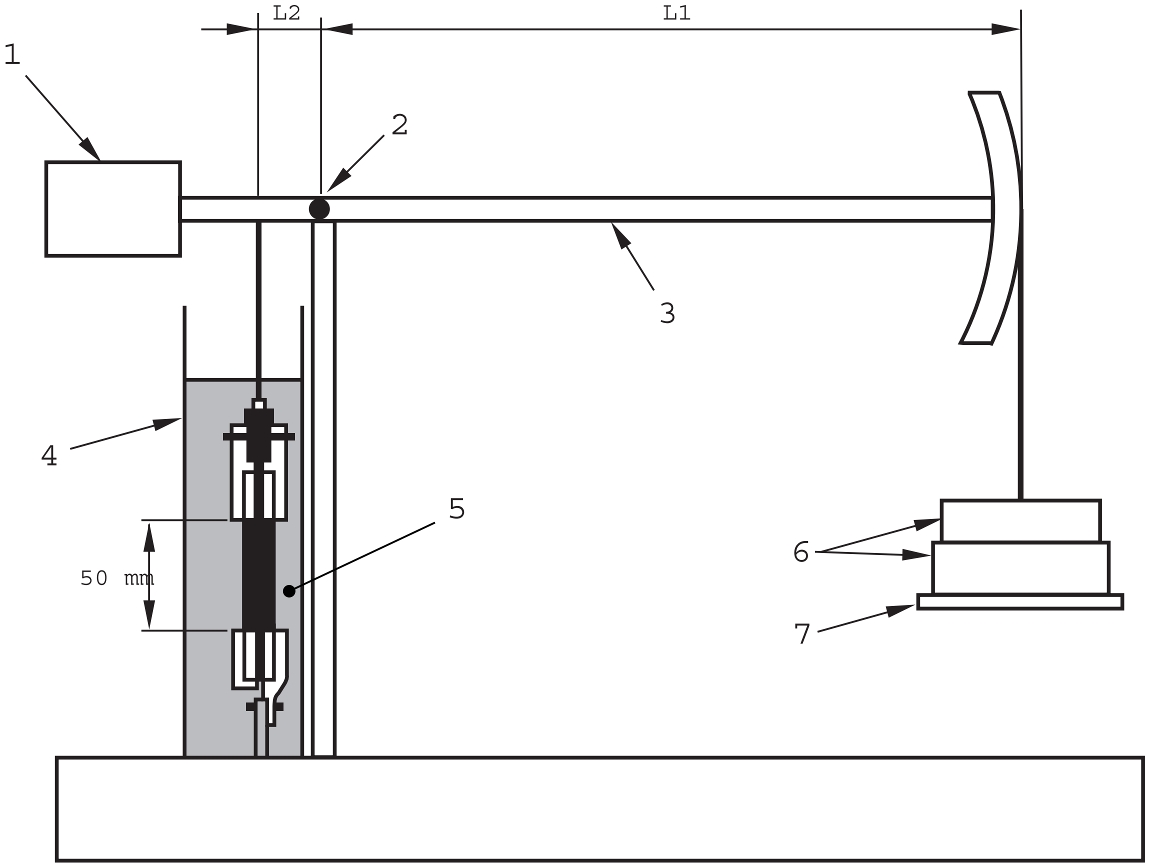
The loading device should be capable of applying the load to an accuracy of ± 1,0%.

NOTE 1 The balanced loading apparatus as described in EN ISO 6252 has also been used satisfactorily.

The functioning and calibration of the equipment shall be checked on a regular basis because the applied load is a critical parameter. The calibration of a lever arm machine can be checked by hanging a series of known weights on the specimen side of the lever arm and counterbalancing these in turn with weights on the weight hanger. The ratio of the former to the latter provides a direct measure of the arm ratio and hence a check on the operation of the machine.

In the case of multiple specimen testing, care must be taken to avoid undue disturbance of the remaining test specimens, when one or more of the other test specimens fail.

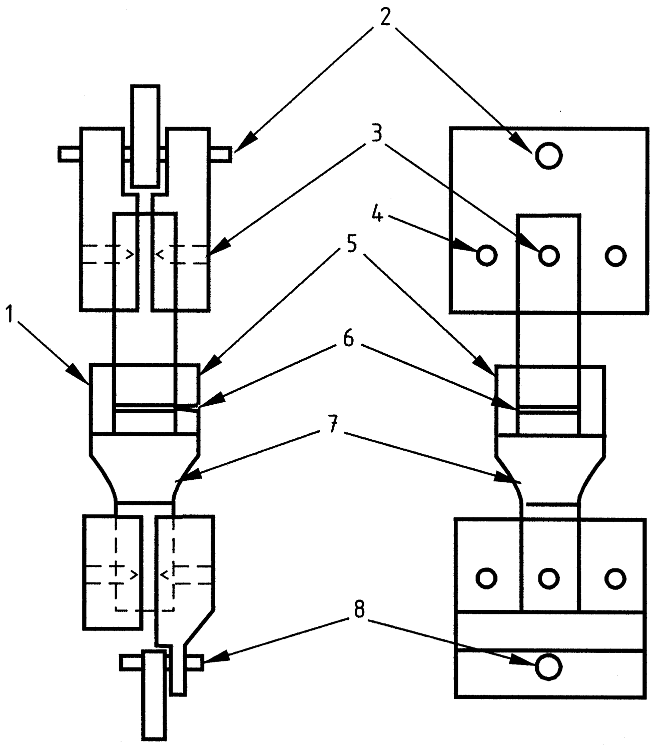
NOTE 2 Measurement of the extension of the test piece or movement of the lever arm provides useful information. The rate of extension of the test specimen will increase when the initiation of the crack from the notch has occurred and will increase rapidly when failure is imminent.



Key

1	Counterweight
2	Low friction roller or knife edge
3	Balance lever arm
4	Example of environmental chamber
5	Environment
6	Weights
7	Weight hanger

Figure B.11 — Loading device



Key

1	Small environmental chamber
2	Coupling pin
3	Grub screws to prevent slipping
4	Clamp bolts
5	Glass tube
6	Notch
7	Heat shrink tube
8	Coupling pin

Figure B.12 — Specimen grip assembly

B.4.2.4.3.2 Thermostatically controlled environment

A suitable chamber shall be designed to contain the environment and ensure full immersion of the test specimen(s). The chamber shall be constructed of material(s) which shall not effect the environment or vice versa. The temperature of the environment shall be controlled to maintain the test specimens within ± 1,0°C of the specified test temperature. Where the environment is aggressive, the chamber can be very small as shown in Figure **B.12** with the test specimen grip assembly.

NOTE When the environment is likely to separate, constant agitation is required.

B.4.2.4.3.3 Temperature measuring device

A calibrated thermometer, thermocouple or thermistor with an accuracy of ± 1,0 °C is suitable.

B.4.2.4.3.4 Timing device

This shall automatically stop or record the point when the test specimen fails by either fracture or excessive displacement of the grips. The accuracy of the timing equipment shall be ± 1 min.

B.4.2.4.3.5 Notching apparatus

The machine shall be designed so that the notches are coplanar and the plane of notching is perpendicular to the tensile axis of the test specimen. The machine shall have a device to ensure that the notches are placed in the centre of the test specimen. Razor blades shall be used provided their notch tip radius is less than 10µm. A cutting machine with a tool, like a broaching device is also acceptable as an alternative provided the notch tip radius is also less than 10 µm.

NOTE A device, appropriately dimensioned, as illustrated in EN ISO 11542-2:1998 Figure B1, would be satisfactory.

B.4.2.4.3.6 Microscope

A microscope is required to allow accurate measurement of the actual ligament dimensions (distance between the tips of the notches) after failure. It shall be read to an accuracy of ± 100µm.

B.4.2.4.4 Preparation of test specimens

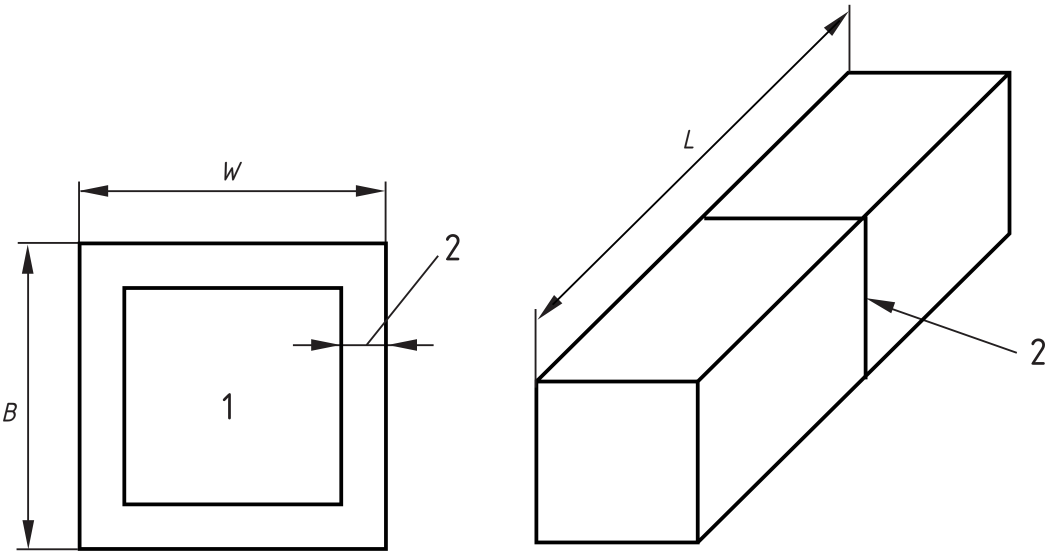
B.4.2.4.4.1 Test specimen geometry

Typical test specimen geometries are given in Table B.1. If other specimens are used, these should be made so that the ligament area is approximately 50% of the total cross sectional area of the specimen see Figure B.13. This is to make sure that specimen failure will occur under the specified conditions.

Table B.1 Test specimen geometry

Specimen dimensions (mm) **Length x Width x Breadth**		**Notch Depth (mm)**	**Stress (MPa)**	**Temperature (°C)**
A	100 x 10 x 10	1,60	4,00 or 6,00	80
B[a]	90 x 6 x 6	1,00	9,00	50
C	90 x 6 x 6	1,00	12,00	23

[a] Test specimen B, 90 x 6,0 x 6,0 mm, with 1,0 mm notch depth is recommended.



Key

W	Width
L	Length
B	Breadth
1	Ligament area
2	Notch

Figure B.13 — Test specimen showing notch and ligament area

B.4.2.4.4.2 Test specimen preparation

Test specimens, for material testing, shall be prepared from compression moulded sheet. EN ISO 1872-2 method B or EN ISO 11542-2:1998 Table 1 shall be used as appropriate. These standards specify moulding and cooling conditions. Machine the test specimens to size from the moulded sheet in accordance with EN ISO 2818. Trim the specimen edges of any remaining swarf left after machining. Test specimens cut from extruded or moulded finished goods shall be machined according to EN ISO 2818.

B.4.2.4.4.3 Test specimen notching

Specimens shall be notched at room temperature. Due care shall be taken to avoid blunting the notch during manufacture e.g. use of excessive speed/force, as this will invalidate the results. If a razor blade is used it shall be used for notching no more than one hundred notches. Whichever device is used for notching, the tolerance on the required notch depth is ± 0,1 mm. Notch integrity shall be inspected microscopically.

B.4.2.4.4.4 Conditioning of test specimens

Notched specimens shall be stored at (23 ± 2)°C according to EN ISO 291. When they are required for use at other temperatures they shall be conditioned in the environment at the test temperature for 1,0 h after clamping in the loading apparatus, prior to loading.

NOTE If other than the recommended test specimens (90 x 6,0 x 6,0) mm specimens are used, for thicker section specimens a longer conditioning period may be required.

B.4.2.4.5 Test procedure

B.4.2.4.5.1 Choice of stress and temperature

Select a stress and temperature from Table B.1 which will cause brittle failure of the test specimens. It is advisable to test a number of specimens, for example 4, with nominal stresses above and below the selected value; this is to compensate for variability in ligament area introduced during the notching operation. For example at a selected stress of 9 MPa, a series of nominal stress values such as 8,25, 8,75, 9,25 and 9,75MPa could be used.

A stress of 9,0 MPa at 50°C using Specimen B, (90 x 6,0 x 6,0) mm with 1,0 mm notch depth, is recommended.

B.4.2.4.5.2 Calculation of test load

The test load is calculated from the formula:

$$M = \frac{A_n \sigma}{9{,}81 R}$$

where

M is the applied mass in kilograms

A_n is the nominal ligament area in mm^2

σ is the required tensile stress in MPa

R is the lever arm ratio (Figure **B.11**), which equals one for a dead weight system

B.4.2.4.5.3 Application of load to test specimen

The notched test specimen is placed in the grips of the lever loading machine (Figures B.11, B.12), taking care to avoid bending and twisting the specimen. The test specimen shall be positioned with half its length free between the grips with the notch plane located in the centre. The whole specimen located in the grips shall be immersed in the environment and conditioned to the temperature specified in Table B.1. After conditioning, the calculated load is gradually applied to the lever arm avoiding shock loading of the test specimen. At the same time the clock or timing device shall be activated.

NOTE 1 It is convenient to lower the weight carrier using a suitable jack or other means.

NOTE 2 Lower temperatures will increase the time to failure of the test specimen. Higher temperatures will decrease the time to failure but if too high a temperature is used, changes in crystallinity and possible oxidative ageing may occur. The same will apply when different environments are used.

B.4.2.4.5.4 Calculation of results

The fracture surface of each test specimen is examined to ensure that it is of the brittle type (see Figure B.10). The dimensions of the ligament are measured using a travelling microscope and the ligament area is calculated.

The applied stress, σ_L, is given by the formula:

$$\sigma_L = \frac{9{,}81 R M}{A_L}$$

where

σ_L is the corrected tensile stress in MpaA_L is the measured ligament area in mm^2

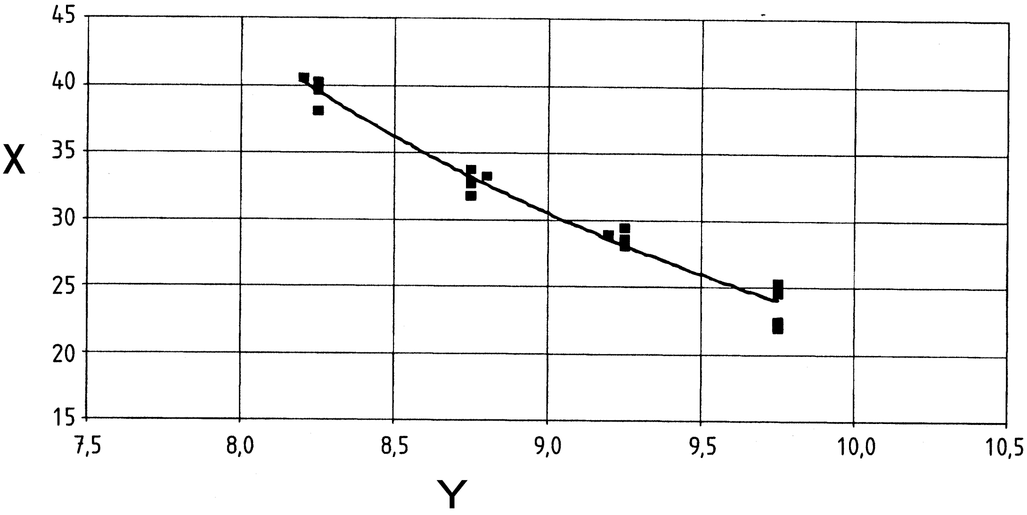
M is the applied mass in kilograms

R is the lever arm ratio (Figure **B.11)** which equals one for a dead weight system.

The time to failure is plotted against the actual applied stress and the failure time at the reference stress interpolated from the graph.

B.4.2.4.6 Precision and reproducibility

At the present time there is no International agreement on precision and reproducibility. The precision of this test method is not known and an indication of repeatability is given in Figure B.14. It is hoped that a full precision statement will be given in a later revision of ISO 16770. For a reference stress of 9 MPa, the failure time is given as 30,5 h with 95% confidence limits of ± 0,5 h. The standard deviation from the regression line is 1 h.



Key
X Time (h)
Y Applied stress (MPa)

Figure B.14 — Indication of repeatability

The major sources of error are :

a) load is applied too quickly, blunting of the notch may occur rendering the results invalid;

b) notch is too blunt after notching;

c) notches are not co-planar;

d) tolerances on environment temperature are not met;

e) environment has aged or has not been stirred.

B.4.2.4.7 Criteria of acceptance

The time to failure in the packaged substance shall be greater than the time to failure in the standard liquid.

B.4.2.4.8 Test report

The test report shall include the following information :

a) Reference to this European Standard;

b) All details necessary for complete identification of the test material e.g. manufacturer, production data etc.;

c) All details necessary for the identification of the test specimen e.g. cut from compression moulded sheet, or from a container;

d) The actual stress, based on the ligament area, used on the test specimen;

e) Time to failure in comparison to the standard liquid or duration of test if failure has not occurred;

f) Specimen dimensions as given in Table B.1;

g) Environment temperature and concentration;

h) Full details of the environment used;

i) Any variations introduced not in the standard e.g. notching procedure;

j) Date and time for start and end of the test;

k) Method of notching i.e. razor blade or broach.

B.4.3 Resistance to molecular degradation (Method C)

B.4.3.1 General

One of the three alternative procedures shall be used for determining the resistance to molecular degradation:

- Procedure C1: measuring melt flow rate;
- Procedure C2: measuring viscosity number;
- Procedure C3: measuring elongation to break.

B.4.3.2 Applicability of method

(i) If the packaged substance causes absorption < 1 %, in accordance with the procedure in **B.4.1**, the specimen shall be dried (e.g. in a vacuum storage oven at 50 °C) until the mass remains constant to a level < 1 % before measuring the MFR

(ii) If the packaged substance causes higher absorption ratios after drying, this implies that procedure C1 is not applicable and in this case procedure C2 or procedure C3 shall be used.

(iii) If the packaged substance (e.g. organic peroxide) penetrates into the PE specimen and leads to cross-linking at elevated temperatures (MFR measurement conditions), Procedure C3 shall be used. Procedure C1 and C2 are not applicable.

(iv) For cross-linked PE (PE-X) Procedure C3 shall be used. Procedures C1 and C2 are not applicable.

B.4.3.3 Melt flow rate (Procedure C1)

B.4.3.3.1 Cut a suitable number of test specimens of an area not less than 450 mm^2 from the packaging side wall or from a compression moulded or extruded sheet. Identical specimen dimensions shall be used for the samples to be immersed in both the packaged substance under evaluation and the standard liquid 55% nitric acid.

B.4.3.3.2 Determine the initial MFR of a minimum of three test specimens in accordance with EN ISO 1133.

B.4.3.3.3 For each evaluation, place a minimum of three test specimens per test interval as specified in B.4.3.2.4 in a suitable receptacle and immerse them in the product under evaluation. Store the receptacle at 40 °C or a higher specified temperature controlled to ± 1,0 °C.

B.4.3.3.4 After 21 days, and subsequently at 7-day intervals for a total storage period of up to 42 days, remove a set of at least three pieces. Carefully wash and dry the specimens and condition them in a vacuum oven under conditions sufficient to remove residual product, until the mass of the specimen remains constant to a level < 1 %.

B.4.3.3.5 Measure the MFR of each set of test specimens in accordance with EN ISO 1133.

B.4.3.4 Viscosity number (VN) (Procedure C2)

B.4.3.4.1 Cut a suitable number of test specimens of an area not less than 450 mm^2 from the centre of a container side wall or from a compression moulded or extruded sheet. Identical specimen dimensions shall be used for the samples to be immersed in both the packaged substance under evaluation and the standard liquid 55% nitric acid.

B.4.3.4.2 Determine the initial VN of a minimum of three test specimens in accordance with EN ISO 1628-3.

B.4.3.4.3 For each evaluation place a minimum of three test specimens per test interval in a suitable receptacle and immerse them in the product under evaluation. Store the receptacle at 40 °C or a higher specified temperature controlled to ±1,0 °C.

B.4.3.4.4 After 21 days, and subsequently at 7-day intervals for a total storage period of up to 42 days, remove a set of at least three specimens. Carefully wash and dry them and condition them in a vacuum oven under conditions sufficient to remove any residual products.

B.4.3.4.5 Measure the VN of each set of test specimens in accordance with EN ISO 1628-3.

B.4.3.5 Elongation to break (Procedure C3)

B.4.3.5.1 Cut a suitable number of test specimens to EN ISO 527-2 Type 5 or 1B, in accordance with EN ISO 11403-3 from the centre of a packaging side wall in the extrusion direction. Identical specimen dimensions shall be used for the samples to be immersed in both the packaged substance under evaluation and the standard liquid 55% nitric acid.

B.4.3.5.2 In accordance with EN ISO 527-2 use a tensile testing machine to determine the initial percentage elongation to break of 5 specimens at an elongation rate of v = 100 mm/min.

B.4.3.5.3 For each evaluation place a minimum of 5 test specimens per test interval in a suitable receptacle and immerse them in the product under evaluation. Store the receptacle at 40 °C or a higher specified temperature controlled to ± 1,0 °C.

B.4.3.5.4 After 21 days, and subsequently at 7-day intervals for a total storage period of up to 42 days, remove a set of at least 5 specimens. Carefully wash and dry them and allow them to reach equilibrium at (23 ± 1) °C prior to testing.

NOTE Other periods of testing may be applied where prior experience has shown them to be suitable, provided they are stated in the test report.

B.4.3.5.5 Measure the percentage elongation to break of each set of test specimens in accordance with EN ISO 527-2.

B.4.3.6 Criteria of assessment

The packaged substance shall be assimilated to the standard liquid 55 % nitric acid if it causes equal or less damage i.e. the specimens show in any of the following tests:

- Procedure C1: equal or lower increase in melt flow rate (MFR);
- Procedure C2: equal or lower decrease in viscosity number (VN);
- Procedure C3: equal or less reduction in elongation to break.

Annex C
(informative)

Assimilation of packaged substance to standard liquids

C.1 Introduction

The chemical compatibility with dangerous liquids may be verified with standard liquids (see annex A and 6.1.5.2.6 RID/ADR), which are representative of the damaging effect of various substances on plastics packagings manufactured from high or medium molecular mass polyethylene. The filling substances assimilated to the standard liquids are listed in 6.1.6.2 of RID/ADR. They may be accepted for carriage without further testing, provided the particular packaging design types have been successfully tested with the relevant standard liquid(s) (see annex A) and provided that the density and vapour pressure of the filling substance is covered by the test level of the particular standard liquids.

The substance list in 6.1.6.2 of RID/ADR represents the best knowledge existing around 1980. The new RID/ADR structure has revealed some omissions and on the basis of input from experts representing plastics manufacturers, plastics converters and plastics packagings users a new assimilation list has been prepared based on:

- the existing list of substances in 6.1.6.2 of RID/ADR and
- new substances where proof of the chemical compatibility is available.

NOTE The list will be reviewed and updated periodically on the basis of new test results.

In preparing this new list the following principles have been applied:

- Substances included in the new assimilation list are based on test results that prove the substance is assimilated to the appropriate standard liquid and its effect on plastics material is no worse than the standard liquids (see annexes A and B).
- Substances not meeting this condition are not included in the assimilation list.
- Some specific substances of the existing list of RID/ADR have been omitted from the new assimilation list,

EXAMPLE 1 According to the existing list UN 1147 Decahydronaphthalene is assimilated to White Spirit (mixture of hydrocarbons). Actually it causes greater absorption.

- Furthermore, the assimilation to standard liquids has changed for some specific substances.

EXAMPLE 2 UN 2014, UN 2914 hydrogen peroxide is assimilated to water, yet it causes molecular degradation and should be assimilated to nitric acid.

- Collective entries as defined in the regulations for the transport of dangerous goods are included in the assimilation list, provided that,
    - i) they describe well-defined chemical groups of substances, and there is confidence that test results of specific members of a chemical group of substances can be assigned to the whole group, or
    - ii) they can be subjected to the new “Rule for collective entries” (see C.3.6).

C.2 Explanation of the assimilation list

C.2.1 Structure

The list of assimilated substances in this annex are shown in the same order as appears in Table A of Chapter 3.2 of RID/ADR.

C.2.2 Explanatory notes for each column:

Column 1	UN No.	Contains the UN number from Chapter 3.2 Table A of RID/ADR
Column 2	Name	This contains the name as shown in Table A of RID/ADR in bold type. Other common isomers and synonyms are included.
Column 3	Description	Contains a descriptive text after the name to clarify the scope of the entry
Column 4	Class	Contains the number of the Class, assigned by RID/ADR.
Column 5	Classification code	Contains the classification code of the dangerous substance in accordance with the procedures and criteria of Part 2 of RID/ADR.
Column 6	Packing group	Contains the packing group number (I, II or III) assigned to the dangerous substance. Certain substances are not assigned to packing groups.
Column 7	Standard Liquid	Contains either the standard liquid(s) (as defined in annex A) to which the entry is assimilated or a reference to an assimilation procedure (see C.3.6).

C.3 Use of the assimilation list

C.3.1 General requirements

The chemical compatibility can be influenced by non-dangerous components, e.g. wetting agents in detergents and disinfectants. Therefore, all components of a solution, mixture or preparation have to be included in the assimilation procedure. If not specifically provided in the assimilation list (see e.g. UN 1791 Hypochlorite, aqueous solution), the chemical compatibility for additional components in solutions or mixtures is not covered except for those cases as indicated in C.3.5.

The proof of the chemical compatibility of design types of plastics packagings manufactured from HDPE not only depends on successfully performed design type tests with the relevant standard liquid(s) itself but is also dependent on the applied test level in connection with the density and vapour pressure of the dangerous substance intended for carriage.

EXAMPLE UN 1736 Benzoyl chloride is assimilated to standard liquids “Mixture of hydrocarbons and wetting solution”. Benzoyl chloride has a vapour pressure of 0,34 kPa at 50 °C and a density of approximately 1,2 kg/l. Design type tests were frequently performed at the minimum required test level. In practice this means that the stacking test is performed with stacking loads considering a density of 1,0 for the mixture of hydrocarbons and a density of 1,2 for the wetting solution. As a consequence the proof of the chemical compatibility of such tested design types would not be covered for benzoyl chloride by reason of the inadequate test level of the standard liquid “mixture of hydrocarbons” for the intended carriage of benzoyl chloride. (Due to the fact that the inner hydraulic test pressure in the most cases is 100 kPa at the minimum, the vapour pressure of the benzoyl chloride would be covered by such a test level.)

C.3.2 Classification according to RID/ADR

In order to undertake a compatibility test it is necessary to classify the substance in accordance with the provisions of RID/ADR. The procedures for classification can be found in Part 2 of RID/ADR. It should be noted that where one of the collective entries of RID/ADR is used (see RID/ADR 2.1.1.2) then it is required that the most specific entry for that substance is used (see RID/ADR 2.1.2.4).

C.3.3 Substances not listed in the assimilation list

When a dangerous substance has not been assimilated to a standard liquid in the list included in this annex then chemical compatibility should be proven by other methods. Design type tests successfully performed with the dangerous substance in accordance with this standard and small scale laboratory tests against standard liquids (see annex B) are two possible procedures proving the chemical compatibility.

C.3.4 Substances listed in the assimilation list

For the assimilation of listed substances and groups of substances mentioned by name (either assigned to single entries or collective entries as defined in RID/ADR 2.1) the following steps should be undertaken:

Look for the UN number determined according to **C.3.2** in column 1 of the assimilation list.

Select the correct row by means of the name, description and/or packing group given in column 2,3 and 6. If there is more than one entry for the particular UN number in the assimilation list, select the row that most corresponds to the substance being assimilated e.g., in terms of concentration, flashpoint etc.

EXAMPLE 3-Methyl-1-heptene is not indicated as a specific isomer mentioned by name among the entries of UN Number 1216 in the assimilation list. In such case the row with the name Isooctene may be selected, if the properties of the isomer are in accordance with the criteria of class 3. classification code F1 and packing group II even if the entry “isomeric mixture” is indicated in cell of the column “Description”.

Chemical compatibility is proven when the packaging design type has been approved for the standard liquids(s) shown in column 7.

Apply the rule for collective entries (as described in **C.3.6**), if this is indicated in column 7 of the selected row the “Rule for collective entries” against this substance.

C.3.5 Aqueous solutions of substances

Aqueous solutions of substances and groups of substances assimilated to specific standard liquid(s) may also be assimilated to that/those standard liquids, provided the following conditions are met:

- the aqueous solution shall be assigned to the same UN number as the listed substance in accordance with the criteria of 2.1.3.3 of RID/ADR, and
- the aqueous solution is not specifically mentioned by name either in Table A of RID/ADR or otherwise in the assimilation list, and
- there is no chemical reaction between the dangerous substance and the solvent water.

EXAMPLE Aqueous solutions of UN 1120 tert-Butanol may be assimilated to the standard liquid acetic acid.
Reasons:

Pure tert-Butanol itself is assimilated to the standard liquid acetic acid in the assimilation list.

Aqueous solutions of tert-Butanol can be classified under the entry UN 1120 BUTANOLS in accordance with 2.1.3.3. of RID/ADR, because the aqueous solution of tert-Butanol does not differ from the entries of the pure substances relating to the class, the packing group(s) and the physical state. Furthermore, the entry 1120 BUTANOLS is not explicitly limited to the pure substances, and aqueous solutions of these substances are not specifically mentioned by name otherwise in Table A of Chapter 3.2 of RID/ADR.

UN 1120 BUTANOLS do not react with water under the normal conditions of transport.

C.3.6 Rule for collective entries

The following steps should be made:

a) Undertake the assimilation procedure for each specific component of the particular solution, mixture or preparation in accordance with **C.3.2, C.3.3** and **C.3.4** taking into account the general requirements of **C.3.1**. If there are components that are known to have no effect on HDPE then these can be ignored (e.g. solid pigments in UN 1263 PAINT or PAINT RELATED MATERIAL).

b) A solution, mixture or preparation cannot be assimilated to a standard liquid if:

the UN number and packing group of one or more of the components does not appear in the list to this annex; or

the classification code of one or more of its dangerous components differs from the classification code for the solution, mixture or preparation itself; or

the phrase “Rule for collective entries” for one or more of the components appears in Column 7 of the list in this annex.

In any of these instances chemical compatibility should be proven by other methods see C.3.3.

c) If all the entries in column 5 are allocated to the same classification code as the entry for the solution, mixture or preparation itself, and if all dangerous components are assimilated to the same standard liquid or the same combination of standard liquids given in column 7, chemical compatibility may be regarded as proven, provided the particular packaging design type is approved for the standard liquid or combination of standard liquids.

d) If there is indicated in column 5 of all selected rows for the dangerous components the same classification code as the entry of the solution, mixture or preparation itself, and if the dangerous components are assimilated to different standard liquids given in column 7, chemical compatibility may be regarded as proven, provided the assimilation of the individual components meets one of the following combinations of standard liquids and the particular packaging design type is approved for that indicated combination of standard liquids:

water/nitric acid 55 % (except when an inorganic acid of classification code C1 has been assimilated to water);

water/wetting solution;

water/acetic acid;

water/mixture of hydrocarbons;

water/n-butyl acetate – n-butyl acetate-saturated wetting solution.

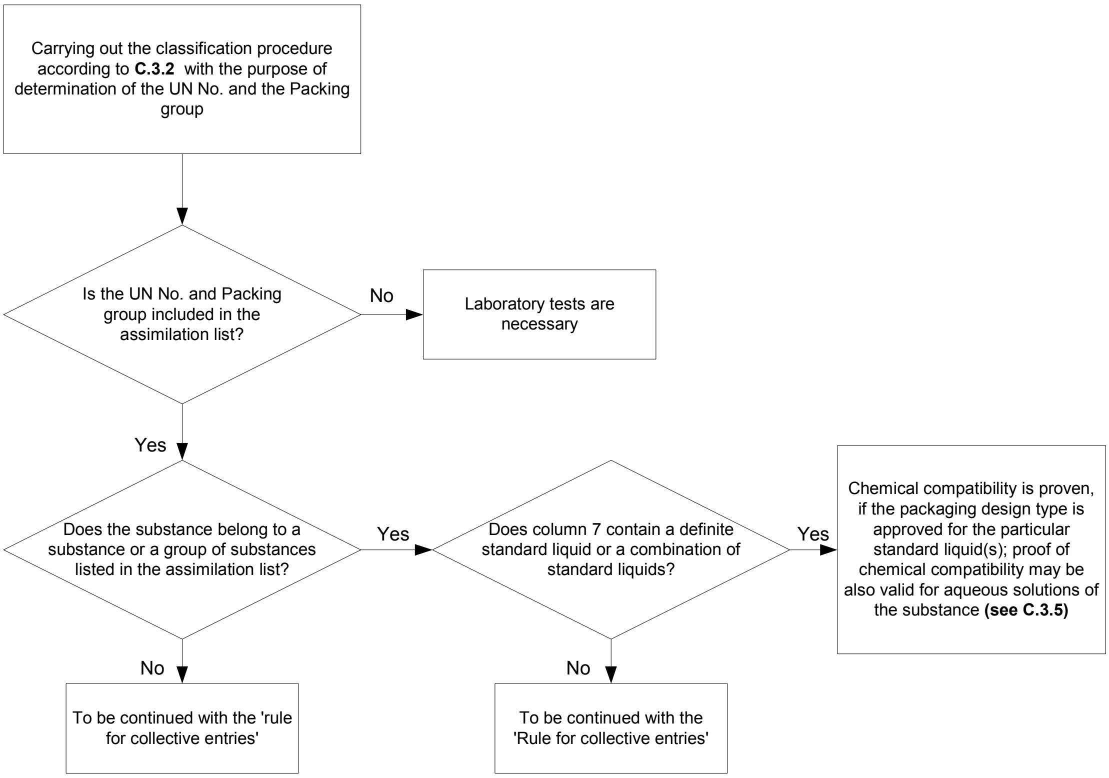
e) In the scope of this rule chemical compatibility of solutions, mixtures and preparations is not proven, if there results another combination of standard liquids from the assimilation process. The chemical compatibility has to be proved by other means.

EXAMPLE 1 Mixture of UN 1940 thioglycolic acid (50%) and UN 2531 methacrylic acid, stabilised (50%);classification: UN 3265 corrosive liquid, acidic, organic, n. o. s.; this n.o.s. entry and both components show the same classification code: C3; step 2 is met. According to the assimilation list UN 1940 thioglycolic acid is assimilated to standard liquid “acetic acid” and UN 2531 methacrylic acid, stabilized to “n-butyl acetate/n-butyl acetate-sat. wetting solution”, one of the not acceptable combinations of standard liquids according to step 4. As a consequence this mixture has to be tested itself according to the small scale laboratory tests.

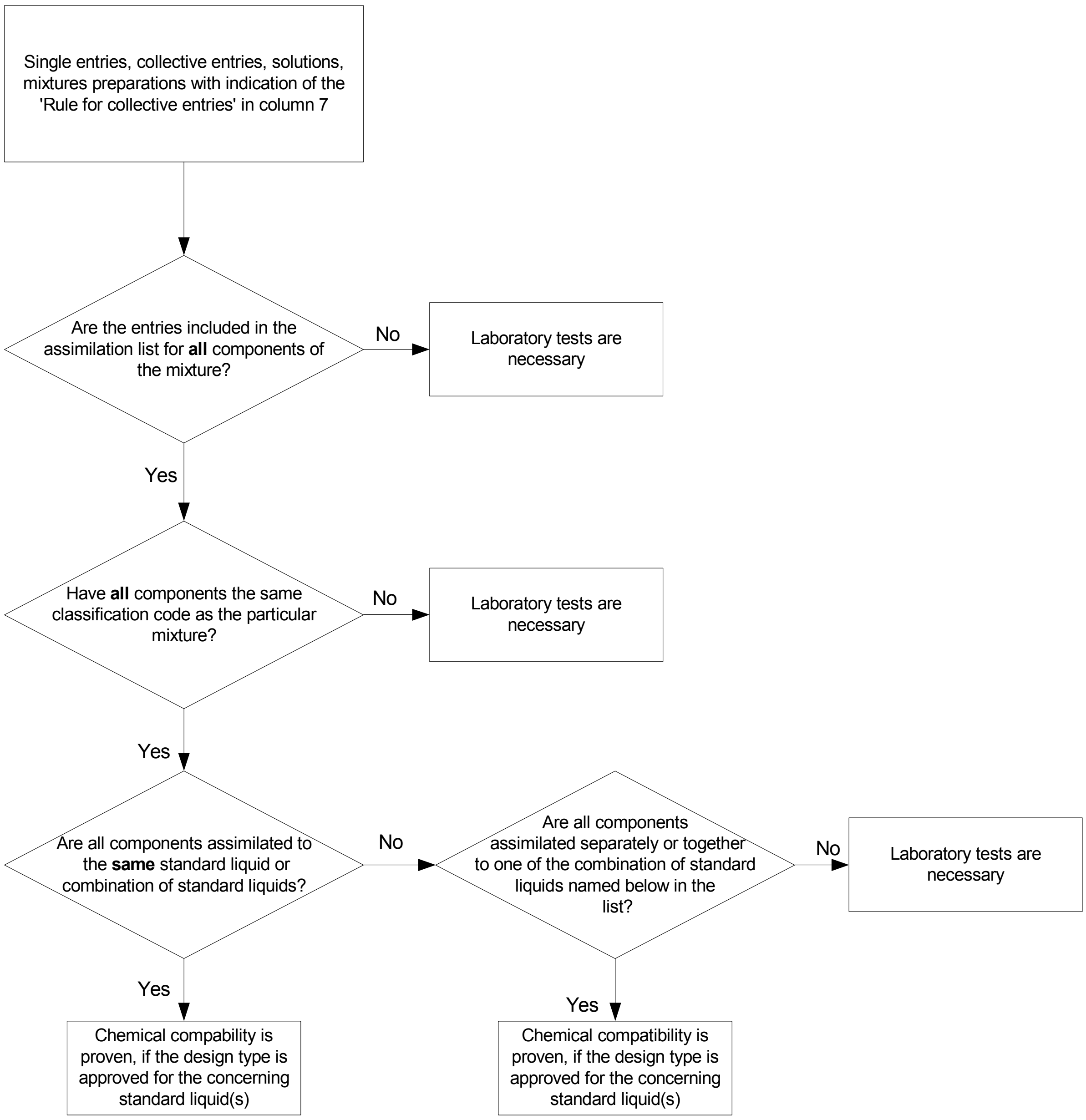
EXAMPLE 2 Mixture of UN 1793 isopropyl acid phosphate (50%) and UN 1803 phenolsulphonic acid (50%); classification: UN 3265 corrosive liquid, acidic, organic, n. o. s.; this n.o.s. entry and both components show the same classification code: C3; step 2 is met. According to the assimilation list UN 1793 isopropyl acid phosphate is assimilated to standard liquid “wetting solution” and 1803 phenolsulphonic acid is assimilated to standard liquid “water”, one of the acceptable combinations of standard liquids according to step 4. As a consequence this mixture can be assimilated to standard liquids “wetting solution and water”, if all general requirements mentioned above are met.

C.3.7 Scheme for the assimilation of substances to standard liquids

(For details see **C.3.1 to C.3.6)**



Rule for collective entries (see **C.3.6**)



List of combinations of standard liquids:

- water/nitric acid (55%) (except when an inorganic acid of classification code C1 has been assimilated to water);
- water/wetting solution;
- water/acetic acid;
- water/mixture of hydrocarbons;
- water/n-butyl acetate – n-butyl acetate /saturated wetting solution saturated wetting solution.

Table C.1 — List of substances assimilated to standard liquids

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
1090	**Acetone**		3	F1	II	Mixture of hydrocarbons **Remark:** applicable only, if it is proved that the permeability of the substance out of the package intended for carriage has an acceptable level
1093	**Acrylonitrile**	**stabilized**	3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	n-Amyl acetate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	sec-Amyl acetate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	Isoamyl acetate	mixture of 2- and 3-methylbutyl acetate	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	Isoamyl acetate	pure	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	**Amyl acetates**	isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	2-Methyl-2-butanol		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	**Pentanols**	synthetic isomeric mixture, flashpoint below 23°C	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	n-Pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	2-Pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	3-Pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	Isoamyl alcohol	containing 2,2-Dimethyl-1-propanol	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	2-Methyl-1-butanol	active alcohol of fermentation	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	3-Methyl-1-butanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	3-Methyl-2-butanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	Pentanols	primary, mixture of 1-pentanol and 2-methyl-1-butanol	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	**Pentanols**	synthetic isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1106	n-Amylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	2,2-Dimethyl-1-propylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	2-Methyl-2-butylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	2-Methylbutylamine		3	FC	II	Mixture of hydrocarbons

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						and wetting solution
1106	3-Methylbutylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	3-Pentylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	**Amylamines**	isomeric mixture, flashpoint below 23°C	3	FC	II	Mixture of hydrocarbons **and** wetting solution
1106	sec-Amylamine		3	FC	III	Mixture of hydrocarbons **and** wetting solution
1106	**Amylamines**	isomeric mixture, flashpoint between 23°C and 61°C	3	FC	III	Mixture of hydrocarbons **and** wetting solution
1109	n-Amyl formate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1109	Isoamyl formate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1109	Amyl formates	isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1120	sec-Butanol		3	F1	II	Acetic acid
1120	tert-Butanol		3	F1	II	Acetic acid
1120	**Butanols**	isomeric mixture, flashpoint below 23°C	3	F1	II	Acetic acid
1120	n-Butanol		3	F1	III	Acetic acid
1120	sec-Butanol	flashpoint between 23°C and 35 °C	3	F1	III	Acetic acid
1120	**Butanols**	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	Acetic acid
1123	sec-Butyl acetate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1123	tert-Butyl acetate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1123	**Butyl acetates**	isomeric mixture, flashpoint below 23°C	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1123	n-Butyl acetate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1123	**Butyl acetates**	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1125	**n-Butylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1128	**n-Butyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1129	**Butyraldehyde**		3	F1	II	Mixture of hydrocarbons
1133	**Adhesives** containing flammable liquid	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1133	**Adhesives** containing flammable liquid	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1133	**Adhesives** containing flammable liquid	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1133	**Adhesives** containing flammable liquid	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1133	**Adhesives** containing flammable liquid	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
1133	**Adhesives** containing flammable liquid	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1133	**Adhesives** containing flammable liquid	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1133	**Adhesives** containing flammable liquid	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4 vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1139	**Coating solution** (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1145	**Cyclohexane**		3	F1	II	Mixture of hydrocarbons
1146	**Cyclopentane**		3	F1	II	Mixture of hydrocarbons
1153	**Ethylene glycol diethyl ether**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
1154	**Diethylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1158	**Diisopropylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1160	**Dimethylamine**	**aqueous solution**	3	FC	II	Mixture of hydrocarbons **and** wetting solution
1165	**Dioxane**		3	F1	II	Mixture of hydrocarbons
1169	**Extracts, aromatic, liquid**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1169	**Extracts, aromatic, liquid**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1169	**Extracts, aromatic, liquid**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1169	**Extracts, aromatic, liquid**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1169	**Extracts, aromatic, liquid**	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1169	**Extracts, aromatic, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1169	**Extracts, aromatic, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1169	**Extracts, aromatic, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1170	**Ethanol**		3	F1	II	Acetic acid
1170	**Ethanol**	aqueous **solution**, flashpoint below 23°C	3	F1	II	Acetic acid
1170	Ethanol	aqueous **solution** containing more than 24% alcohol by volume, flashpoint between 23°C and 61°C	3	F1	III	Acetic acid
1171	**Ethylene glycol monoethyl ether**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1172	**Ethylene glycol monoethyl ether acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1173	**Ethyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1177	**2-Ethylbutyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1178	**2-Ethylbutyraldehyde**		3	F1	II	Mixture of hydrocarbons
1180	**Ethyl butyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1188	**Ethylene glycol**		3	F1	III	n-Butyl acetate/

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
	monomethyl ether					n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1189	**Ethylene glycol monomethyl ether acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1190	**Ethyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1191	n-Octyl aldehyde		3	F1	III	Mixture of hydrocarbons
1191	2-Ethylhexaldehyde		3	F1	III	Mixture of hydrocarbons
1191	3-Ethylhexaldehyde		3	F1	III	Mixture of hydrocarbons
1191	Ethylhexaldehydes	isomeric mixture	3	F1	III	Mixture of hydrocarbons
1191	Isooctaldehyde		3	F1	III	Mixture of hydrocarbons
1191	**Octyl aldehydes**	isomeric mixture	3	F1	III	Mixture of hydrocarbons
1192	**Ethyl lactate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1195	**Ethyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1197	**Extracts, flavouring, liquid**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1197	**Extracts, flavouring, liquid**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1197	**Extracts, flavouring, liquid**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1197	**Extracts, flavouring, liquid**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1197	**Extracts, flavouring, liquid**	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1197	**Extracts, flavouring, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1197	**Extracts, flavouring, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1197	**Extracts, flavouring, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1198	**Formaldehyde**	aqueous **solution**, flashpoint between 23°C and 61°C	3	FC	III	Acetic acid
1202	**Diesel fuel**	flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1202	**Diesel fuel** EN 590		3	F1	III	Mixture of hydrocarbons
1202	**Gas oil**	flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1202	**Heating oil, extra light**		3	F1	III	Mixture of hydrocarbons
1202	Heating oil	flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1202	**Heating oil, light**		3	F1	III	Mixture of hydrocarbons
1203	**Motor spirit**	Super Plus EN 228, unleaded	3	F1	II	Mixture of hydrocarbons
1203	**Motor spirit**	Super EN 228,	3	F1	II	Mixture of hydrocarbons

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		unleaded				
1203	**Motor spirit**	Normal EN 228, unleaded	3	F1	II	Mixture of hydrocarbons
1206	n-Heptane		3	F1	II	Mixture of hydrocarbons
1206	2,2-Dimethylpentane		3	F1	II	Mixture of hydrocarbons
1206	2,3-Dimethylpentane		3	F1	II	Mixture of hydrocarbons
1206	2,4-Dimethylpentane		3	F1	II	Mixture of hydrocarbons
1206	2,2,3-Trimethylbutane		3	F1	II	Mixture of hydrocarbons
1206	3,3-Dimethylpentane		3	F1	II	Mixture of hydrocarbons
1206	3-Ethylpentane		3	F1	II	Mixture of hydrocarbons
1206	2-Methylhexane		3	F1	II	Mixture of hydrocarbons
1206	3-Methylhexane		3	F1	II	Mixture of hydrocarbons
1206	**Heptanes**	isomeric mixture, flashpoint below 23°C	3	F1	II	Mixture of hydrocarbons
1207	n-Hexaldehyde		3	F1	III	Mixture of hydrocarbons
1208	n-Hexane		3	F1	II	Mixture of hydrocarbons
1208	2,2-Dimethylbutane		3	F1	II	Mixture of hydrocarbons
1208	2-Methylpentane		3	F1	II	Mixture of hydrocarbons
1208	3-Methylpentane		3	F1	II	Mixture of hydrocarbons
1208	Hexanes	isomeric mixture	3	F1	II	Mixture of hydrocarbons
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1210	**Printing ink**, flammable or **Printing ink related material** flammable (including printing ink thinning or reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1212	**Isobutanol**		3	F1	III	Acetic acid
1213	**Isobutyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1214	**Isobutylamine**		3	FC	II	Mixture of hydrocarbons

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						and wetting solution
1216	2,3-Dimethyl-2-hexene		3	F1	II	Mixture of hydrocarbons
1216	2,5-Dimethyl-2-hexene		3	F1	II	Mixture of hydrocarbons
1216	2-Ethyl-1-hexene		3	F1	II	Mixture of hydrocarbons
1216	2-Methyl-1-heptene		3	F1	II	Mixture of hydrocarbons
1216	2-Methyl-2-heptene		3	F1	II	Mixture of hydrocarbons
1216	2,3,4-Trimethyl-1-pentene		3	F1	II	Mixture of hydrocarbons
1216	3,4,4-Trimethyl-2-pentene		3	F1	II	Mixture of hydrocarbons
1216	**Isooctenes**	isomeric mixture	3	F1	II	Mixture of hydrocarbons
1219	**Isopropanol**		3	F1	II	Acetic acid
1220	**Isopropyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1221	**Isopropylamine**		3	FC	I	Mixture of hydrocarbons **and** wetting solution
1223	**Kerosene**		3	F1	III	Mixture of hydrocarbons
1224	3,3-Dimethyl-2-butanone		3	F1	II	Mixture of hydrocarbons
1224	**Ketones**	**liquid, n.o.s**., vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1224	**Ketones**	**liquid, n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1224	**Ketones**	**liquid, n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1230	**Methanol**		3	FT1	II	Acetic acid
1230	**Methanol**	aqueous solution, with more than 50% methanol	3	FT1	II	Acetic acid
1231	**Methyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1233	**Methylamyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1235	**Methylamine**	**aqueous solution**	3	FC	II	Mixture of hydrocarbons **and** wetting solution
1237	**Methyl butyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1247	**Methyl methacrylate**	**monomer, stabilized**	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1248	**Methyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1262	n-Octane		3	F1	II	Mixture of hydrocarbons
1262	2,2-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	2,3-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	2,4-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	2,5-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	3,3-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	3,4-Dimethylhexane		3	F1	II	Mixture of hydrocarbons
1262	Isooctane		3	F1	II	Mixture of hydrocarbons
1262	2-Methyl-3-ethylpentane		3	F1	II	Mixture of hydrocarbons
1262	3-Methyl-3-ethylpentane		3	F1	II	Mixture of hydrocarbons
1262	2-Methylheptane		3	F1	II	Mixture of hydrocarbons
1262	3-Methylheptane		3	F1	II	Mixture of hydrocarbons
1262	4-Methylheptane		3	F1	II	Mixture of hydrocarbons
1262	3-Ethylhexane		3	F1	II	Mixture of hydrocarbons
1262	2,2,3-Trimethylpentane		3	F1	II	Mixture of hydrocarbons
1262	2,3,3-Trimethylpentane		3	F1	II	Mixture of hydrocarbons
1262	2,3,4-Trimethylpentane		3	F1	II	Mixture of hydrocarbons
1262	**Octanes**	isomeric mixture	3	F1	II	Mixture of hydrocarbons
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
	Paint related material (including paint thinning and reducing compound)					
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1263	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1265	n-Pentane		3	F1	II	Mixture of hydrocarbons
1266	**Perfumery products** with flammable solvents	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1266	**Perfumery products** with flammable solvents	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1266	**Perfumery products** with flammable solvents	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1266	**Perfumery products** with flammable solvents	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1266	**Perfumery products** with	flashpoint between	3	F1	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
	flammable solvents	23°C and 61°C				
1266	**Perfumery products** with flammable solvents	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1266	**Perfumery products** with flammable solvents	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1266	**Perfumery products** with flammable solvents	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1268	**Petroleum distillates** or **Petroleum products**	**n.o.s.**, vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1268	**Petroleum distillates** or **Petroleum products**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1268	Coal tar naphtha	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Mixture of hydrocarbons
1268	**Petroleum distillates** or **Petroleum products**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1268	**Petroleum distillates** or **Petroleum products**	**n.o.s.**, flashpoint between 23 °C and 61 °C	3	F1	III	Rule for collective entries
1274	**n-Propanol**	pure	3	F1	II	Acetic acid
1274	**n-Propanol**	technical, flashpoint between 23°C and 61°C	3	F1	III	Acetic acid
1275	**Propionaldehyde**		3	F1	II	Mixture of hydrocarbons
1276	**n-Propyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1277	**n-Propylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1281	Isopropyl formate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1281	n-Propyl formate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1281	**Propyl formates**	isomeric mixture	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1282	**Pyridine**	pure	3	F1	II	Mixture of hydrocarbons
1282	**Pyridine**	technical, with additions of Methylpyridines	3	F1	II	Mixture of hydrocarbons
1286	**Rosin oil**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1286	**Rosin oil**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1286	**Rosin oil**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1286	**Rosin oil**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1286	**Rosin oil**	flashpoint between	3	F1	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		23°C and 61°C				
1286	**Rosin oil**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1286	**Rosin oil**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1286	**Rosin oil**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1287	**Rubber solution**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1287	**Rubber solution**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1287	**Rubber solution**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1287	**Rubber solution**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1287	**Rubber solution**	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1287	**Rubber solution**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1286	**Rubber solution**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1286	**Rubber solution**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1296	**Triethylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1297	**Trimethylamine**	**aqueous solution**, not more than 50% trimethylamine, by mass	3	FC	I	Mixture of hydrocarbons **and** wetting solution
1297	**Trimethylamine**	**aqueous solution**, not more than 50% trimethylamine, by mass	3	FC	II	Mixture of hydrocarbons **and** wetting solution
1297	**Trimethylamine**	**aqueous solution**, not more than 50% trimethylamine, by mass	3	FC	III	Mixture of hydrocarbons **and** wetting solution
1301	**Vinyl acetate**	**stabilized**	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1306	**Wood preservatives, liquid**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
1306	**Wood preservatives, liquid**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1306	**Wood preservatives, liquid**	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1306	**Wood preservatives, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1306	**Wood preservatives, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1306	**Wood preservatives, liquid**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1547	**Aniline**		6.1	T1	II	Acetic acid
1590	2,3-Dichloroaniline	liquid	6.1	T1	II	Acetic acid
1590	2,6-Dichloroaniline	liquid	6.1	T1	II	Acetic acid
1590	**Dichloroanilines**	isomeric mixture, **liquid**	6.1	T1	II	Acetic acid
1602	**Dye** or **Dye intermediate**	**liquid**, highly **toxic, n.o.s.**, flashpoint more than 61 °C	6.1	T1	I	Rule for collective entries
1602	**Dye** or **Dye intermediate**	**liquid, toxic, n.o.s.**, flashpoint more than 61 °C	6.1	T1	II	Rule for collective entries
1602	**Dye** or **Dye intermediate**	**liquid,** slightly **toxic, n.o.s.**, flashpoint more than 61 °C	6.1	T1	III	Rule for collective entries
1604	**Ethylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
1715	**Acetic anhydride**		8	CF1	II	Acetic acid
1717	**Acetyl chloride**		3	FC	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1718	**Butyl acid phosphate**		8	C3	III	Wetting solution
1719	**Caustic alkali liquid**	**n.o.s.**, inorganic, flashpoint more than 61°C	8	C5	II	Rule for collective entries
1719	Hydrogen sulphides	aqueous solution	8	C5	III	Acetic acid
1719	**Caustic alkali liquid**	**n.o.s.**, inorganic, flashpoint more than 61°C	8	C5	III	Rule for collective entries
1730	**Antimony pentachloride**	**liquid**, pure	8	C1	II	Water
1736	**Benzoyl chloride**		8	C3	II	Mixture of hydrocarbons **and** wetting solution
1750	**Chloroacetic acid**	aqueous **solution**	6.1	TC1	II	Acetic acid
1750	**Chloroacetic acid**	**solution**, mixtures of mono- and dichloroacetic acid	6.1	TC1	II	Acetic acid
1752	**Chloroacetyl chloride**		6.1	TC1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1755	**Chromic acid**	aqueous **solution** with not more than 30% chromic acid, corrosive	8	C1	II	Nitric acid (55%)
1755	**Chromic acid**	aqueous **solution** with not more than 30% chromic acid, slightly corrosive	8	C1	III	Nitric acid (55%)
1760	**Corrosive liquid**	**n.o.s.**, flashpoint more than 61°C, highly corrosive	8	C9	I	Rule for collective entries
1760	Cyanamide	aqueous solution with	8	C9	II	Water

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		not more than 50% cyanamide				
1760	O,O-Diethyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	O,O-Diisopropyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	O,O-Di-n-propyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	**Corrosive liquid**	**n.o.s.**, flashpoint more than 61°C, corrosive	8	C9	II	Rule for collective entries
1760	**Corrosive liquid**	**n.o.s.**, flashpoint more than 61°C, slightly corrosive	8	C9	III	Rule for collective entries
1761	**Cupriethylenediamine**	aqueous **solution**, corrosive	8	CT1	II	Mixture of hydrocarbons **and** wetting solution
1761	**Cupriethylenediamine**	aqueous **solution**, slightly corrosive	8	CT1	III	Mixture of hydrocarbons **and** wetting solution
1764	**Dichloroacetic acid**		8	C3	II	Acetic acid
1775	**Fluoroboric acid**	aqueous solution with not more than 50% fluoroboric acid	8	C1	II	Water
1778	**Fluorosilicic acid**		8	C1	II	Water
1779	**Formic acid**		8	C3	II	Acetic acid
1783	Hexamethylenediamine	aqueous solution, corrosive	8	C7	II	Mixture of hydrocarbons **and** wetting solution
1783	**Hexamethylenediamine**	aqueous **solution**, slightly corrosive	8	C7	III	Mixture of hydrocarbons **and** wetting solution
1787	**Hydriodic acid**	aqueous solution, corrosive	8	C1	II	Water
1787	**Hydriodic acid**	aqueous solution, slightly corrosive	8	C1	III	Water
1788	**Hydrobromic acid**	40% aqueous solution	8	C1	II	Water
1788	**Hydrobromic acid**	48% aqueous solution	8	C1	II	Water
1788	**Hydrobromic acid**	62% aqueous solution	8	C1	II	Water
1788	**Hydrobromic acid**	aqueous solution, corrosive	8	C1	II	Water
1788	**Hydrobromic acid**	aqueous solution, slightly corrosive	8	C1	III	Water
1789	**Hydrochloric acid**	not more than 38% aqueous solution, corrosive	8	C1	II	Water
1789	**Hydrochloric acid**	aqueous solution, slightly corrosive	8	C1	III	Water
1790	**Hydrofluoric acid**	with not more than 60% hydrofluoric acid	8	CT1	II	Water the permissible period of use: not more than 2 years
1791	Potassium hypochlorite	aqueous solution, corrosive	8	C9	II	Nitric acid (55%) *
1791	Sodium hypochlorite	aqueous solution, corrosive	8	C9	II	Nitric acid (55%) *
1791	**Hypochlorite**	aqueous **solution**s, corrosive, containing wetting agents as customary in trade	8	C9	II	Nitric acid (55%) **and** wetting solution *
1791	**Hypochlorite**	aqueous **solution**, corrosive	8	C9	II	Nitric acid (55%) *
1791	Potassium hypochlorite	aqueous solution, slightly corrosive	8	C9	III	Nitric acid (55%) *
1791	Sodium hypochlorite	aqueous solution, slightly corrosive	8	C9	III	Nitric acid (55%) *
1791	**Hypochlorite**	aqueous **solution**s, slightly corrosive, containing wetting agents as customary in trade	8	C9	III	Nitric acid (55%) **and** wetting solution *
1791	**Hypochlorite**	aqueous **solution**,	8	C9	III	Nitric acid (55%) *

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		slightly corrosive				
*) For UN 1791: Test to be carried out only with vent. If the test is carried out with nitric acid as the standard liquid, an acid-resistant vent and gasket shall be used. For hypochlorite solutions, vents and gaskets of the same design type, resistant to hypochlorite (e.g. of silicone rubber) but not resistant to nitric acid, are also permitted.						
1793	**Isopropyl acid phosphate**		8	C3	III	Wetting solution
1802	**Perchloric acid**	aqueous solution with not more than 50% acid, by mass	8	CO1	II	Water
1803	para-Phenolsulphonic acid	65% aqueous solution	8	C3	II	Water
1803	**Phenolsulphonic acid**	isomeric mixture, **liquid**	8	C3	II	Water
1805	**Phosphoric acid**	**liquid**	8	C1	III	Water
1814	**Potassium hydroxide**	aqueous **solution**, corrosive	8	C5	II	Water
1814	**Potassium hydroxide**	aqueous **solution**, slightly corrosive	8	C5	III	Water
1824	**Sodium hydroxide**	aqueous **solution**, corrosive	8	C5	II	Water
1824	**Sodium hydroxide**	aqueous **solution**, slightly corrosive	8	C5	III	Water
1830	**Sulphuric acid**	with more than 51% pure acid	8	C1	II	Water
1832	**Sulphuric acid, spent**	chemical stable	8	C1	II	Water
1833	**Sulphurous acid**		8	C1	II	Water
1835	**Tetramethylammonium hydroxide**	aqueous solution, flashpoint more than 61°C	8	C7	II	Water
1840	**Zinc chloride**	aqueous **solution**	8	C1	III	Water
1848	**Propionic acid**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1862	**Ethyl crotonate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1863	**Fuel, aviation, turbine engine**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Mixture of hydrocarbons
1863	**Fuel, aviation, turbine engine**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Mixture of hydrocarbons
1863	**Fuel, aviation, turbine engine**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Mixture of hydrocarbons
1863	**Fuel, aviation, turbine engine**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Mixture of hydrocarbons
1863	**Fuel, aviation, turbine engine**	flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
1866	**Resin solution, flammable**	vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1866	**Resin solution, flammable**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1866	**Resin solution, flammable**	vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1866	**Resin solution, flammable**	vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1866	**Resin solution, flammable**	flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1866	**Resin solution, flammable**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1866	**Resin solution, flammable**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4,	3	F1	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		vapour pressure at 50°C more than 110 kPa but not more than 175 kPa				
1866	**Resin solution, flammable**	having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
1902	**Diisooctyl acid phosphate**		8	C3	III	Wetting solution
1906	**Sludge acid**		8	C1	II	Nitric acid (55%)
1908	Sodium chlorite	aqueous solution, corrosive	8	C9	II	Acetic acid
1908	**Chlorite**	aqueous **solution**s, corrosive	8	C9	II	Acetic acid
1908	Sodium chlorite	aqueous solution, slightly corrosive	8	C9	III	Acetic acid
1908	**Chlorite**	aqueous **solution**s, slightly corrosive	8	C9	III	Acetic acid
1914	**Butyl propionates**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1915	**Cyclohexanone**		3	F1	III	Mixture of hydrocarbons
1917	**Ethyl acrylate**	**stabilized**	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1919	**Methyl acrylate**	**stabilized**	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1920	n-Nonane		3	F1	III	Mixture of hydrocarbons
1920	2,3-Dimethylheptane		3	F1	III	Mixture of hydrocarbons
1920	2,5-Dimethylheptane		3	F1	III	Mixture of hydrocarbons
1920	3,4-Dimethylheptane		3	F1	III	Mixture of hydrocarbons
1920	3,5-Dimethylheptane		3	F1	III	Mixture of hydrocarbons
1920	4-Ethylheptane		3	F1	III	Mixture of hydrocarbons
1920	3-Ethyl-2-methylhexane		3	F1	III	Mixture of hydrocarbons
1920	3-Ethyl-3-methylhexane		3	F1	III	Mixture of hydrocarbons
1920	3-Ethyl-4-methylhexane		3	F1	III	Mixture of hydrocarbons
1920	2-Methyloctane		3	F1	III	Mixture of hydrocarbons
1920	3-Methyloctane		3	F1	III	Mixture of hydrocarbons
1920	4-Methyloctane		3	F1	III	Mixture of hydrocarbons
1920	2,3,3-Trimethylhexane		3	F1	III	Mixture of hydrocarbons
1920	2,3,4-Trimethylhexane		3	F1	III	Mixture of hydrocarbons
1920	3,3,4-Trimethylhexane		3	F1	III	Mixture of hydrocarbons
1920	**Nonanes**	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
1935	**Cyanide solution**	**n.o.s.**, inorganic, highly toxic	6.1	T4	I	Water
1935	**Cyanide solution**	**n.o.s.**, inorganic, toxic	6.1	T4	II	Water
1935	**Cyanide solution**	**n.o.s.**, inorganic, slightly toxic	6.1	T4	III	Water
1940	**Thioglycolic acid**		8	C3	II	Acetic acid
1986	**Alcohols, flammable, toxic**	**n.o.s.**	3	FT1	I	Rule for collective entries
1986	**Alcohols, flammable, toxic**	**n.o.s.**	3	FT1	II	Rule for collective entries
1986	**Alcohols, flammable, toxic**	**n.o.s.**, flashpoint between 23°C and 61°C, slightly toxic	3	FT1	III	Rule for collective entries
1987	**Alcohols**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1987	**Alcohols**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1987	Cyclohexanol	technical pure	3	F1	III	Acetic acid
1987	Alcohols	**n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1988	**Aldehydes, flammable, toxic**	**n.o.s.**	3	FT1	I	Rule for collective entries
1988	**Aldehydes, flammable, toxic**	**n.o.s.**	3	FT1	II	Rule for collective entries
1988	**Aldehydes, flammable, toxic**	**n.o.s.**, flashpoint between 23°C	3	FT1	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		and 61°C, slightly toxic				
1989	**Aldehydes**	**n.o.s.**, vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1989	**Aldehydes**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1989	**Aldehydes**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1989	**Aldehydes**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1989	**Aldehydes**	**n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1992	**Flammable liquid, toxic**	**n.o.s.**	3	FT1	I	Rule for collective entries
1992	**Flammable liquid, toxic**	**n.o.s.**	3	FT1	II	Rule for collective entries
1992	2,6-cis-Dimethyl-morpholine		3	FT1	III	Mixture of hydrocarbons
1992	**Flammable liquid, toxic**	**n.o.s.**, flashpoint between 23°C and 61°C, slightly toxic	3	FT1	III	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
1993	Propionic acid vinyl ester		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1993	**Flammable liquid**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
1993	(1-Methoxy-2-propyl) acetate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1993	**Flammable liquid**	**n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 175 kPa	3	F1	III	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	III	Rule for collective entries
1993	**Flammable liquid**	**n.o.s.**, having a flashpoint below 23°C and viscous according to 2.2.3.1.4, vapour pressure at 50°C not more than 110 kPa	3	F1	III	Rule for collective entries
2014	**Hydrogen peroxide**	**aqueous solution**, with not less than 20% but not more than 60% hydrogen peroxide, stabilized as necessary	5.1	OC1	II	Nitric acid (55%)
2022	**Cresylic acid**	liquid mixture containing cresols, xylenols and methyl phenols	6.1	TC1	II	Acetic acid
2030	**Hydrazine**	**aqueous solution** with	8	CT1	II	Water

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		not less than 37% but not more than 64% hydrazine, by mass				
2030	**Hydrazine hydrate**	aqueous solution with 64% hydrazine	8	CT1	II	Water
2031	**Nitric acid**	other than red fuming, with not more than 55% pure acid	8	CO1	II	Nitric acid (55%)
2045	**Isobutyraldehyde**		3	F1	II	Mixture of hydrocarbons
2050	**Diisobutylene**	**isomeric compounds**	3	F1	II	Mixture of hydrocarbons
2053	**Methyl isobutyl carbinol**		3	F1	III	Acetic acid
2054	**Morpholine**		3	CF1	I	Mixture of hydrocarbons
2057	**Tripropylene**	flashpoint below 23°C	3	F1	II	Mixture of hydrocarbons
2057	**Tripropylene**	flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
2058	2,2-Dimethylpropanal		3	F1	II	Mixture of hydrocarbons
2058	Isovaleraldehyde		3	F1	II	Mixture of hydrocarbons
2058	2-Methylbutanal		3	F1	II	Mixture of hydrocarbons
2058	n-Valeraldehyde		3	F1	II	Mixture of hydrocarbons
2058	**Valeraldehydes**	isomeric mixture	3	F1	II	Mixture of hydrocarbons
2059	**Nitrocellulose solution, flammable**	with not more than 12.6% nitrogen, by dry mass, and not more than 55 % nitrocellulose, vapour pressure at 50°C more than 175 kPa	3	D	I	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2059	**Nitrocellulose solution, flammable**	with not more than 12.6% nitrogen, by dry mass, and not more than 55 % nitrocellulose, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	D	I	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2059	**Nitrocellulose solution, flammable**	with not more than 12.6% nitrogen, by dry mass, and not more than 55 % nitrocellulose, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	D	II	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2059	**Nitrocellulose solution, flammable**	with not more than 12.6% nitrogen, by dry mass, and not more than 55 % nitrocellulose, vapour pressure at 50°C not more than 110 kPa	3	D	II	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2059	**Nitrocellulose solution, flammable**	with not more than 12.6% nitrogen, by dry mass, and not more than 55 % nitrocellulose, flashpoint between 23°C and 61°C	3	D	III	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2075	**Chloral**	**anhydrous, stabilized**	6.1	T1	II	Wetting solution
2076	meta-Cresol	liquid	6.1	TC1	II	Acetic acid
2076	ortho-Cresol	liquid	6.1	TC1	II	Acetic acid
2076	para-Cresol	liquid	6.1	TC1	II	Acetic acid
2076	**Cresols**	isomeric mixture, **liquid**	6.1	TC1	II	Acetic acid
2078	**Toluene diisocyanate**	liquid	6.1	T1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2079	**Diethylenetriamine**		8	C7	II	Mixture of hydrocarbons
2209	**Formaldehyde**	aqueous **solution** with 37% Formaldehyde, methanol content: 8-10%	8	C9	III	Acetic acid
2209	**Formaldehyde**	aqueous **solution**, with not less than 25% formaldehyde	8	C9	III	Water
2218	**Acrylic acid**	**stabilized**	8	CF1	II	n-Butyl acetate/ n-butyl acetate-saturated

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						wetting solution
2227	**n-Butyl methacrylate**	**stabilized**	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2235	**para-Chlorobenzyl chloride**	liquid	6.1	T2	III	Mixture of hydrocarbons
2241	**Cycloheptane**		3	F1	II	Mixture of hydrocarbons
2242	**Cycloheptene**		3	F1	II	Mixture of hydrocarbons
2243	**Cyclohexyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2244	**Cyclopentanol**		3	F1	III	Acetic acid
2245	**Cyclopentanone**		3	F1	III	Mixture of hydrocarbons
2247	**n-Decane**		3	F1	III	Mixture of hydrocarbons
2248	**Di-n-butylamine**		8	CF1	II	Mixture of hydrocarbons
2258	**1,2-Propylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2259	**Triethylenetetramine**		8	C7	II	Water
2260	**Tripropylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2263	1,1-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	cis-1,2-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	trans-1,2-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	1,2-Dimethyl-cyclohexane	cis/trans-mixture	3	F1	II	Mixture of hydrocarbons
2263	cis-1,3-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	trans-1,3-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	1,3-Dimethyl-cyclohexane	cis/trans-mixture	3	F1	II	Mixture of hydrocarbons
2263	cis-1,4-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	trans-1,4-Dimethyl-cyclohexane		3	F1	II	Mixture of hydrocarbons
2263	1,4-Dimethyl-cyclohexane	cis/trans - mixture	3	F1	II	Mixture of hydrocarbons
2263	**Dimethylcyclohexanes**	isomeric mixture	3	F1	II	Mixture of hydrocarbons
2264	**N,N-Dimethyl-cyclohexylamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2265	**N,N-Dimethyl-formamide**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2266	**Dimethyl-N-propylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2269	**3,3'-Imino-dipropylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2270	**Ethylamine**	**aqueous solution**, with not less than 50% but not more than 70% ethylamine, flashpoint between 23 °C and 61 °C, corrosive or slightly corrosive	3	FC	II	Mixture of hydrocarbons **and** wetting solution
2275	**2-Ethylbutanol**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2276	**2-Ethylhexylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2277	**Ethyl methacrylate**	stabilized	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2278	**n-Heptene**		3	F1	II	Mixture of hydrocarbons
2282	n-Hexanol	technical	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	2-Hexanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3-Hexanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
2282	2,3-Dimethyl-2-butanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3,3-Dimethyl-1-butanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3,3-Dimethyl-2-butanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	2-Methyl-1-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	2-Methyl-3-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3-Methyl-1-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3-Methyl-2-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	3-Methyl-3-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	4-Methyl-1-pentanol		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2282	**Hexanols**	isomeric mixtures	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2283	**Isobutyl methacrylate**	**stabilized**	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2286	**Pentamethylheptane**		3	F1	III	Mixture of hydrocarbons
2287	**Isoheptene**		3	F1	II	Mixture of hydrocarbons
2288	**Isohexene**		3	F1	II	Mixture of hydrocarbons
2289	**Isophoronediamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2293	**4-Methoxy-4-methyl-pentan-2-one**		3	F1	III	Mixture of hydrocarbons
2296	**Methylcyclohexane**		3	F1	II	Mixture of hydrocarbons
2297	2-Methylcyclohexanone		3	F1	III	Mixture of hydrocarbons
2297	3-Methylcyclohexanone		3	F1	III	Mixture of hydrocarbons
2297	4-Methylcyclohexanone		3	F1	III	Mixture of hydrocarbons
2297	**Methylcyclohexanones**	isomeric mixture	3	F1	III	Mixture of hydrocarbons
2298	**Methylcyclopentane**		3	F1	II	Mixture of hydrocarbons
2302	**5-Methylhexan-2-one**		3	F1	III	Mixture of hydrocarbons
2308	**Nitrosylsulphuric acid**	**liquid**	8	C1	II	Water
2309	**Octadiene**		3	F1	II	Mixture of hydrocarbons
2313	alpha-Picoline		3	F1	III	Mixture of hydrocarbons
2313	beta-Picoline		3	F1	III	Mixture of hydrocarbons
2313	gamma-Picoline		3	F1	III	Mixture of hydrocarbons
2313	**Picolines**	isomeric mixture	3	F1	III	Mixture of hydrocarbons
2317	**Sodium cuprocyanide**	aqueous **solution**	6.1	T4	I	Water
2320	**Tetraethylenepentamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2324	**Triisobutylene**	mixture of C12-monoolefines, flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
2326	**Trimethylcyclohexylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2327	2,2,4-Trimethyl-hexamethylenediamine		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2327	**Trimethylhexa-methylenediamines**	isomeric mixture	8	C7	III	Mixture of hydrocarbons **and** wetting solution
2330	**Undecane**		3	F1	III	Mixture of hydrocarbons
2336	**Allyl formate**		3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						wetting solution
2348	**Butyl acrylates**	**stabilized**	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2357	**Cyclohexylamine**	flashpoint not less than 23°C	8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2361	**Diisobutylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2366	**Diethyl carbonate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2367	**alpha-Methylvaleraldehyde**		3	F1	II	Mixture of hydrocarbons
2370	**1-Hexene**		3	F1	II	Mixture of hydrocarbons
2372	**1,2-Di-(dimethylamino)-ethane**		3	F1	II	Mixture of hydrocarbons **and** wetting solution
2379	**1,3-Dimethylbutylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2383	**Dipropylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2385	**Ethyl isobutyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2393	**Isobutyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2394	**Isobutyl propionate**	flashpoint between 23°C and 61°C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2396	**Methacrylaldehyde**	**stabilized**	3	FT1	II	Mixture of hydrocarbons
2400	**Methyl isovalerate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2401	**Piperidine**		8	CF1	I	Mixture of hydrocarbons **and** wetting solution
2403	**Isopropenyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2405	**Isopropyl butyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2406	**Isopropyl isobutyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2409	**Isopropyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2410	**1,2,3,6-Tetrahydropyridine**		3	F1	II	Mixture of hydrocarbons
2427	**Potassium chlorate**	**aqueous solution**, oxidizing	5.1	O1	II	Water
2427	**Potassium chlorate**	**aqueous solution**, slightly oxidizing	5.1	O1	III	Water
2428	**Sodium chlorate**	**aqueous solution**, oxidizing	5.1	O1	II	Water
2428	**Sodium chlorate**	**aqueous solution**, slightly oxidizing	5.1	O1	III	Water
2429	**Calcium chlorate**	**aqueous solution**, oxidizing	5.1	O1	II	Water
2429	**Calcium chlorate**	**aqueous solution**, slightly oxidizing	5.1	O1	III	Water
2436	**Thioacetic acid**		3	F1	II	Acetic acid
2457	**2,3-Dimethylbutane**		3	F1	II	Mixture of hydrocarbons
2491	**Ethanolamine**		8	C7	III	Wetting solution
2491	**Ethanolamine**	**aqueous solution**	8	C7	III	Wetting solution
2496	**Propionic anhydride**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2524	**Ethyl orthoformate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						wetting solution
2526	**Furfurylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2527	**Isobutyl acrylate**	**stabilized**	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2528	**Isobutyl isobutyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2529	**Isobutyric acid**		3	FC	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2531	**Methacrylic acid**	**stabilized**	8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2542	**Tributylamine**		6.1	T1	II	Mixture of hydrocarbons
2560	**2-Methylpentan-2-ol**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2564	**Trichloroacetic acid**	aqueous **solution**, corrosive	8	C3	II	Acetic acid
2564	**Trichloroacetic acid**	aqueous **solution**, slightly corrosive	8	C3	III	Acetic acid
2565	**Dicyclohexylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2571	**Ethylsulphuric acid**		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2571	**Alkylsulphuric acids**		8	C3	II	Rule for collective entries
2580	**Aluminium bromide**	aqueous **solutions**	8	C1	III	Water
2581	**Aluminium chloride**	aqueous **solutions**	8	C1	III	Water
2582	**Ferric chloride**	aqueous **solution**	8	C1	III	Water
2584	Methane sulphonic acid	with more than 5% free sulphuric acid, liquid	8	C1	II	Water
2584	**Alkylsulphonic acids**	**liquid**, with more than 5% free sulphuric acid	8	C1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2584	Benzene sulphonic acid	with more than 5% free sulphuric acid, liquid	8	C1	II	Water
2584	Dodecylbenzene sulphonic acid	with more than 5% free sulphuric acid, liquid	8	C1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2584	para-Toluene sulphonic acid	liquid, with more than 5% free sulphuric acid	8	C1	II	Water
2584	Toluene sulphonic acids	liquid, with more than 5% free sulphuric acid	8	C1	II	Water
2584	**Arylsulphonic acids**	liquid, with more than 5% free sulphuric acid	8	C1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2586	Methane sulfonic acid	with not more than 5% free sulphuric acid, liquid	8	C1	III	Water
2586	**Alkylsulphonic acids**	**liquid**, with not more than 5% free sulphuric acid	8	C1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2586	Benzene sulphonic acid	with not more than 5% free sulphuric acid, liquid*	8	C1	III	Water
2586	Dodecylbenzene sulphonic acid	with not more than 5% sulphuric acid	8	C1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2586	para-Toluene sulphonic acid	with not more than 5% free sulphuric acid, liquid*	8	C1	III	Water
2586	Toluene sulphonic acids	liquid, with not more than 5% free sulphuric acid	8	C1	III	Water
2586	**Arylsulphonic acids**	**liquid**, with not more than 5% free sulphuric acid	8	C1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2610	**Triallylamine**		3	FC	III	Mixture of hydrocarbons **and**

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						wetting solution
2614	**Methallyl alcohol**		3	F1	III	Acetic acid
2617	2-Methylcyclohexanol	cis/trans-mixture, flashpoint between 23°C and 61°C	3	F1	III	Acetic acid
2617	cis-2-Methyl-cyclohexanol		3	F1	III	Acetic acid
2617	trans-2-Methyl-cyclohexanol		3	F1	III	Acetic acid
2617	**Methylcyclohexanols**	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	Acetic acid
2619	**Benzyldimethylamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2620	n-Amyl butyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2620	iso-Amyl butyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2620	tert-Amyl butyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2620	Isoamyl butyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2620	**Amyl butyrates**	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2622	**Glycidaldehyde**	flashpoint below 23° C	3	FT1	II	Mixture of hydrocarbons
2626	**Chloric acid**	**aqueous solution** with not more than 10% chloric acid	5.1	O1	II	Nitric acid (55%)
2656	**Quinoline**	flashpoint more than 61°C	6.1	T1	III	Water
2672	**Ammonia solution**	relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia	8	C5	III	Water
2683	**Ammonium sulphide**	aqueous **solution**, flashpoint between 23°C and 61°C	8	CFT	II	Acetic acid
2684	**Diethylaminopropylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2685	**N,N-Diethylethylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2693	Ammonium bisulphite	aqueous solution with not more than 42% ammonium bisulphite	8	C1	III	Water
2693	Calcium bisulphite	aqueous solution	8	C1	III	Water
2693	Magnesium bisulphite	aqueous solution	8	C1	III	Water
2693	Potassium bisulphite	aqueous solution	8	C1	III	Water
2693	Sodium bisulphite	aqueous solution with not more than 22% sodium bisulphite	8	C1	III	Water
2693	Zinc bisulphite	aqueous solution	8	C1	III	Water
2693	**Bisulphites**	**aqueous solution, n.o.s.**, inorganic	8	C1	III	Water
2707	2,5-Dimethyl-1,4-dioxane		3	F1	II	Mixture of hydrocarbons
2707	**Dimethyldioxanes**	flashpoint below 23°C	3	F1	II	Mixture of hydrocarbons
2707	4,4-Dimethyl-1,3-dioxane		3	F1	II	Mixture of hydrocarbons
2707	Dimethyldioxanes	flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
2733	Dimethylamine	aqueous solution, flashpoint below 23°C, boiling point not more than 35 °C, vapour pressure at 50 °C not more than 3 bar	3	FC	I	Mixture of hydrocarbons **and** wetting solution
2733	Methylamine	aqueous solution, flashpoint below 23°C,	3	FC	I	Mixture of hydrocarbons **and**

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		boiling point not more than 35 °C, vapour pressure at 50 °C not more than 3 bar				wetting solution
2733	Trimethylamine	aqueous solution, containing more than 50% trimethylamine by mass, vapour pressure at 50 °C not more than 3 bar	3	FC	I	Mixture of hydrocarbons **and** wetting solution
2733	**Amines, flammable, corrosive or Polyamines, flammable, corrosive**	**n.o.s.,** flashpoint below 23°C	3	FC	I	Rule for collective entries
2733	Cyclohexylamine	flashpoint below 23°C	3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	N,N-Dimethylethylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	N,N-Dimethyl-isopropylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	N-Ethylbutylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	n-Hexylamine	flashpoint below 23°C	3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	3-Methyl-2-butylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	**Amines, flammable, corrosive or Polyamines, flammable, corrosive**	**n.o.s.**, flashpoint below 23°C	3	FC	II	Mixture of hydrocarbons **and** wetting solution
2733	3-Dimethylamino-propylamine	flashpoint between 23°C and 61°C	3	FC	III	Mixture of hydrocarbons **and** wetting solution
2733	**Amines, flammable, corrosive or Polyamines, flammable, corrosive**	**n.o.s.**, flashpoint between 23 °C and 61 °C, slightly corrosive	3	FC	III	Mixture of hydrocarbons **and** wetting solution
2734	3-Methoxy-1-propanamine		8	CF1	I	Mixture of hydrocarbons **and** wetting solution
2734	**Amines, liquid, corrosive, flammable** **or** **Polyamines, liquid, corrosive, flammable**	**n.o.s.**, highly corrosive, flashpoint not more than 61 °C	8	CF1	I	Mixture of hydrocarbons **and** wetting solution
2734	Di-sec-butylamine		8	CF1	II	Mixture of hydrocarbons
2734	Ethylamine	aqueous solution, not more than 50% ethylamine by mass, flashpoint between 23°C and 61°C	8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2734	N-Ethylcyclohexylamine		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2734	n-Hexylamine	flashpoint between 23°C and 61°C	8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2734	1,3-Propylenediamine		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2734	**Amines, liquid, corrosive, flammable** **or** **Polyamines, liquid, corrosive, flammable**	**n.o.s.**, corrosive, flashpoint between 23 °C and 61 °C	8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2735	N-Cyclohexyl-1,3-propanediamine		8	C7	I	Mixture of hydrocarbons **and** wetting solution

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
2735	4,4'-Methylene bis-(2-methyl-cyclohexylamine)		8	C7	I	Mixture of hydrocarbons **and** wetting solution
2735	**Amines, liquid, corrosive, or Polyamines, liquid, corrosive**	**n.o.s.**, flashpoint more than 61°C, highly corrosive	8	C7	I	Mixture of hydrocarbons **and** wetting solution
2735	N,N'-Bis-(3-aminopropyl)-ethylenediamine		8	C7	II	Mixture of hydrocarbons **and** wetting solution
2735	N,N'-Di-sec-butyl-para-phenylenediamine		8	C7	II	Mixture of hydrocarbons **and** wetting solution
2735	Dimethylstearylamine		8	C7	II	Mixture of hydrocarbons **and** wetting solution
2735	N,N-Dimethylalkylamines	isomeric mixture of C12- and C14-alkyles	8	C7	II	Mixture of hydrocarbons **and** wetting solution
2735	**Amines, liquid, corrosive, or Polyamines, liquid, corrosive**	**n.o.s.**, flashpoint more than 61°C, corrosive	8	C7	II	Mixture of hydrocarbons **and** wetting solution
2735	Benzylamine	flashpoint more than 61°C	8	C7	III	Mixture of hydrocarbons **and** wetting solution
2735	N,N-Diisopropyl-ethanolamine		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2735	Piperazine	aqueous solution	8	C7	III	Mixture of hydrocarbons **and** wetting solution
2735	**Amines, liquid, corrosive, or Polyamines, liquid, corrosive**	**n.o.s.**, flashpoint more than 61°C, slightly corrosive	8	C7	III	Mixture of hydrocarbons **and** wetting solution
2739	**Butyric anhydride**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2789	**Acetic acid**	**glacial** or aqueous **solution**, more than 80% acid, by mass	8	CF1	II	Acetic acid
2790	**Acetic acid**	aqueous **solution**, not less than 50% but not more than 80% acid, by mass	8	C3	II	Acetic acid
2790	**Acetic acid**	aqueous **solution**, more than 10% and less than 50% acid, by mass	8	C3	III	Acetic acid
2796	**Sulphuric acid**	with not more than 51% pure acid	8	C1	II	Water
2797	**Battery fluid**	**alkali**, Potassium/Sodium hydroxide, aqueous solution	8	C5	II	Water
2810	**Toxic liquid, organic**	**n.o.s.**, highly toxic	6.1	T1	I	Rule for collective entries
2810	**Toxic liquid, organic**	**n.o.s.**, toxic	6.1	T1	II	Rule for collective entries
2810	2-Chloro-6-fluorobenzyl chloride	stabilized	6.1	T1	III	Mixture of hydrocarbons
2810	2-Phenylethanol		6.1	T1	III	Acetic acid
2810	Ethylene glycol monohexyl ether		6.1	T1	III	Acetic acid
2810	**Toxic liquid, organic**	**n.o.s.**, slightly toxic	6.1	T1	III	Rule for collective entries
2815	**N-Aminoethylpiperazine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2818	**Ammonium polysulphide**	aqueous **solution**, corrosive	8	CT1	II	Acetic acid
2818	**Ammonium polysulphide**	aqueous **solution**, slightly corrosive	8	CT1	III	Acetic acid
2819	**Amyl acid phosphate**		8	C3	III	Wetting solution
2820	**n-Butyric acid**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
2821	**Phenol**	aqueous **solution**, toxic, non-alkaline	6.1	T1	II	Acetic acid
2821	**Phenol**	aqueous **solution**, slightly toxic, non alkaline	6.1	T1	III	Acetic acid
2829	**n-Caproic acid**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2837	Ammonium bisulphate	aqueous solution, corrosive	8	C1	II	Water
2837	Potassium bisulphate	aqueous solution, corrosive	8	C1	II	Water
2837	Sodium bisulphate	aqueous solution, corrosive	8	C1	II	Water
2837	**Bisulphates**	**aqueous solution**, corrosive	8	C1	II	Water
2837	Ammonium bisulphate	aqueous solution, slightly corrosive	8	C1	III	Water
2837	Potassium bisulphate	aqueous solution, slightly corrosive	8	C1	III	Water
2837	Sodium bisulphate	aqueous solution, slightly corrosive	8	C1	III	Water
2837	**Bisulphates**	**aqueous solution**, slightly corrosive	8	C1	III	Water
2838	**Vinyl butyrate**	**stabilized**	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2841	**Di-n-amylamine**		3	FT1	III	Mixture of hydrocarbons **and** wetting solution
2850	**Propylene tetramer**	mixture of C12-monoolefines, flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
2873	**N,N-Di-n-butylaminoethanol**		6.1	T1	III	Acetic acid
2874	**Furfuryl alcohol**		6.1	T1	III	Acetic acid
2920	**Corrosive liquid, flammable**	**n.o.s.**, flashpoint not more than 61 °C, highly corrosive	8	CF1	I	Rule for collective entries
2920	O,O-Diethyl-dithiophosphoric acid	flashpoint between 23°C and 61°C	8	CF1	II	Wetting solution
2920	O,O-Dimethyl-dithiophosphoric acid	flashpoint between 23°C and 61°C	8	CF1	II	Wetting solution
2920	Hydrogen bromide	33% solution in glacial acetic acid	8	CF1	II	Wetting solution
2920	Tetramethylammonium hydroxide	aqueous solution, flashpoint between 23°C and 61°C	8	CF1	II	Water
2920	**Corrosive liquid, flammable**	**n.o.s.**, flashpoint between 23°C and 61°C, corrosive	8	CF1	II	Rule for collective entries
2922	**Corrosive liquid, toxic**	**n.o.s.**, flashpoint more than 61 °C, highly corrosive	8	CT1	I	Rule for collective entries
2922	Ammonium sulphide	aqueous solution, flashpoint more than 61°C	8	CT1	II	Water
2922	Cresols	aqueous alkaline solution	8	CT1	II	Acetic acid
2922	Phenol	aqueous alkaline solution	8	CT1	II	Acetic acid
2922	**Corrosive liquid, toxic**	**n.o.s.**, flashpoint more than 61°C, corrosive, toxic	8	CT1	II	Rule for collective entries
2922	**Corrosive liquid, toxic**	**n.o.s.**, flashpoint more than 61°C, corrosive, slightly toxic	8	CT1	II	Rule for collective entries
2922	Sodium hydrogen fluoride	aqueous solution	8	CT1	III	Water
2922	**Corrosive liquid, toxic**	**n.o.s.**, flashpoint more than 61°C, slightly corrosive, slightly toxic	8	CT1	III	Rule for collective entries
2924	**Flammable liquid, corrosive**	**n.o.s.**, flashpoint below 23°C	3	FC	I	Rule for collective entries
2924	**Flammable liquid, corrosive**	**n.o.s.**, flashpoint below 23°C	3	FC	II	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
2924	**Flammable liquid, corrosive**	**n.o.s.**, flashpoint between 23°C and 61°C, slightly corrosive	3	FC	III	Rule for collective entries
2927	**Toxic liquid, corrosive, organic**	**n.o.s.**, flashpoint more than 61°C, highly toxic, corrosive or slightly corrosive	6.1	TC1	I	Rule for collective entries
2927	**Toxic liquid, corrosive, organic**	**n.o.s.**, flashpoint more than 61°C	6.1	TC1	II	Rule for collective entries
2933	**Methyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2934	**Isopropyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2935	**Ethyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2936	**Thiolactic acid**		6.1	T1	II	Acetic acid
2941	2-Fluoroaniline		6.1	T1	III	Acetic acid
2941	3-Fluoroaniline		6.1	T1	III	Acetic acid
2941	4-Fluoroaniline		6.1	T1	III	Acetic acid
2941	**Fluoroanilines**	isomeric mixture	6.1	T1	III	Acetic acid
2943	**Tetrahydrofurfurylamine**		3	F1	III	Mixture of hydrocarbons
2945	N-Methylbutylamine		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2946	**2-Amino-5-diethylaminopentane**		6.1	T1	III	Mixture of hydrocarbons **and** wetting solution
2947	**Isopropyl chloroacetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2984	**Hydrogen peroxide**	**aqueous solution**, with not less than 8% but less than 20% hydrogen peroxide, stabilized as necessary	5.1	O1	III	Nitric acid (55%)
3056	**n-Heptaldehyde**		3	F1	III	Mixture of hydrocarbons
3065	**Alcoholic beverages**	with more than 70% alcohol by volume	3	F1	II	Acetic acid
3065	**Alcoholic beverages**	with more than 24% but not more than 70% alcohol by volume	3	F1	III	Acetic acid
3066	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	corrosive	8	C9	II	Rule for collective entries
3066	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or **Paint related material** (including paint thinning and reducing compound)	slightly corrosive	8	C9	III	Rule for collective entries
3079	**Methacrylonitrile**	**stabilized**	3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3080	Diphenylmethane-4,4'-diisocyanate solution	flashpoint between 23°C and 61°C	6.1	TF1	II	Acetic acid
3082	sec-Alcohol C_6-C_{17} poly (3-6) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Alcohol C_{12}-C_{15} poly (1-3) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and**

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						mixture of hydrocarbons
3082	Alcohol C_{13}-C_{15} poly (1-6) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Aviation turbine fuel JP-5	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Aviation turbine fuel JP-7	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Coal tar	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Coal tar naphtha	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Creosote produced of coal tar	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Creosote produced of wood tar	flashpoint more than 61°C	9	M6	III	Mixture of hydrocarbons
3082	Cresyl diphenyl phosphate		9	M6	III	Wetting solution
3082	Decyl acrylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Diisobutyl phthalate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Di-n-butyl phthalate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Hydrocarbons	liquid, flashpoint more than 61°C, environmentally hazardous	9	M6	III	Rule for collective entries
3082	Isodecyl diphenyl phosphate		9	M6	III	Wetting solution
3082	Methylnaphthalenes	isomeric mixture, liquid	9	M6	III	Mixture of hydrocarbons
3082	Triaryl phosphates	n.o.s.	9	M6	III	Wetting solution
3082	Triaryl phosphates	isopropylated	9	M6	III	Wetting solution
3082	Tricresyl phosphate	with not less than 1% but not more than 3% ortho-isomer	9	M6	III	Wetting solution
3082	Tricresyl phosphate	with less than 1% ortho-isomer	9	M6	III	Wetting solution
3082	Trixylenyl phosphate		9	M6	III	Wetting solution
3082	Zinc alkyl dithiophosphate	C3-C14	9	M6	III	Wetting solution
3082	Zinc aryl dithiophosphate	C7-C16	9	M6	III	Wetting solution
3082	**Environmentally hazardous substance**	**liquid, n.o.s.**	9	M6	III	Rule for collective entries
3099	**Oxidizing liquid, toxic**	**n.o.s.**,	5.1	OT1	I	Rule for collective entries
3099	Barium chlorate	aqueous solution	5.1	OT1	II	Water
3099	Barium perchlorate	aqueous solution	5.1	OT1	II	Water
3099	Lead perchlorate	aqueous solution	5.1	OT1	II	Water
3099	**Oxidizing liquid, toxic**	**n.o.s.**,	5.1	OT1	II	Rule for collective entries
3099	**Oxidizing liquid, toxic**	**n.o.s.** slightly toxic	5.1	OT1	III	Rule for collective entries
3101	**Organic Peroxide Type B**	**liquid**	5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3103	**Organic Peroxide Type C**	**liquid**	5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3105	**Organic Peroxide Type D**	**liquid**	5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
						wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3107	**Organic Peroxide Type E**	**liquid**	5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3109	**Organic Peroxide Type F**	**liquid**	5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3111	**Organic Peroxide Type B**	**liquid, temperature controlled**	5.2	P2		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3113	**Organic Peroxide Type C**	**liquid, temperature controlled**	5.2	P2		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3115	**Organic Peroxide Type D**	**liquid, temperature controlled**	5.2	P2		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3117	**Organic Peroxide Type E**	**liquid, temperature controlled**	5.2	P2		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
3119	**Organic Peroxide Type F**	**liquid, temperature controlled**	5.2	P2		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid (55%)**
**) For UN Nos. 3101, 3103, 3105, 3107, 3109, 3111, 3113, 3115, 3117, 3119 (tert-butyl hydroperoxide with more than 40 % peroxide content and peroxyacetic acids are excluded): All organic peroxides in a technically pure form or in solution in solvents which, as far as their compatibility is concerned, are covered by the standard liquid "mixture of hydrocarbons" in this list.Compatibility of vents and gaskets with organic peroxides may be verified, also independently of the design type test, by laboratory tests with nitric acid.						
3145	Butylphenols	liquid, n.o.s., highly corrosive	8	C3	I	Acetic acid
3145	**Alkylphenols**	**liquid, n.o.s.**, including C2 to C12 homologues, highly corrosive	8	C3	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3145	Butylphenols	liquid, n.o.s., corrosive	8	C3	II	Acetic acid
3145	Dodecylphenol		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3145	Nonylphenol	technical, isomeric mixture of 2-/4-Nonylphenol 10/90%	8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3145	**Alkylphenols**	**liquid, n.o.s.**, including C2 to C12 homologues, corrosive	8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
3145	meta-Butylphenol		8	C3	III	Acetic acid
3145	meta-sec-Butylphenol		8	C3	III	Acetic acid
3145	meta-tert-Butylphenol	liquid	8	C3	III	Acetic acid
3145	ortho-Butylphenol		8	C3	III	Acetic acid
3145	ortho-sec-Butylphenol		8	C3	III	Acetic acid
3145	ortho-tert-Butylphenol		8	C3	III	Acetic acid
3145	para-Butylphenol		8	C3	III	Acetic acid
3145	meta-Isobutylphenol		8	C3	III	Acetic acid
3145	ortho-Isobutylphenol		8	C3	III	Acetic acid
3145	Butylphenol	isomeric mixture, liquid	8	C3	III	Acetic acid
3145	Butylphenols	liquid, n.o.s., slightly corrosive	8	C3	III	Acetic acid
3145	**Alkylphenols**	**liquid, n.o.s**., including C2 to C12 homologues, slightly corrosive	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3149	**Hydrogen peroxide and peroxyacetic acid mixture**	with UN 2790 acetic acid, UN 2796 sulphuric acid and/or UN 1805 phosphoric acid, water and not more than 5% peroxyacetic acid, **stabilized**	5.1	OC1	II	Wetting solution **and** nitric acid (55%)
3210	Chlorate and calcium chloride	mixture, aqueous solution, oxidizing	5.1	O1	II	Water
3210	Chlorate and magnesium chloride	mixture, aqueous solution, oxidizing	5.1	O1	II	Water
3210	Chlorate and sodium chloride	mixture, aqueous solution, oxidizing	5.1	O1	II	Water
3210	Strontium chlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3210	**Chlorates**	**inorganic, aqueous solution, n.o.s.**, oxidizing	5.1	O1	II	Water
3210	Chlorate and calcium chloride	mixture, aqueous solution, slightly oxidizing	5.1	O1	III	Water
3210	Chlorate and magnesium chloride	mixture, aqueous solution, slightly oxidizing	5.1	O1	III	Water
3210	Chlorate and sodium chloride	mixture, aqueous solution, slightly oxidizing	5.1	O1	III	Water
3210	Strontium chlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3210	**Chlorates**	**inorganic, aqueous solution, n.o.s.**, slightly oxidizing	5.1	O1	III	Water
3211	Calcium perchlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3211	Magnesium perchlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3211	Potassium perchlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3211	Sodium perchlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3211	Strontium perchlorate	aqueous solution, oxidizing	5.1	O1	II	Water
3211	**Perchlorates**	**inorganic, aqueous solution, n.o.s.**, oxidizing	5.1	O1	II	Water
3211	Calcium perchlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3211	Magnesium perchlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3211	Potassium perchlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3211	Sodium perchlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3211	Strontium perchlorate	aqueous solution, slightly oxidizing	5.1	O1	III	Water
3211	**Perchlorates**	**inorganic, aqueous solution, n.o.s.**, slightly oxidizing	5.1	O1	III	Water

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
3213	**Bromates**	**inorganic, aqueous solution, n.o.s.**, oxidizing	5.1	O1	II	Water
3213	**Bromates**	**inorganic, aqueous solution, n.o.s.**, slightly oxidizing	5.1	O1	III	Water
3214	**Permanganates**	**inorganic, aqueous solution, n.o.s.**	5.1	O1	II	Water
3216	**Persulphates**	**inorganic, aqueous solution, n.o.s.**	5.1	O1	III	Wetting solution
3218	**Nitrates**	**inorganic, aqueous solution, n.o.s.**, oxidizing	5.1	O1	II	Water
3218	Calcium nitrate	aqueous solution	5.1	O1	III	Water
3218	Magnesium nitrate	aqueous solution	5.1	O1	III	Water
3218	**Nitrates**	**inorganic, aqueous solution, n.o.s.**, slightly oxidizing	5.1	O1	III	Water
3219	**Nitrites**	**inorganic, aqueous solution, n.o.s.**, oxidizing	5.1	O1	II	Water
3219	**Nitrites**	**inorganic, aqueous solution, n.o.s.**, slightly oxidizing	5.1	O1	III	Water
3264	**Corrosive liquid, acidic, inorganic**	**n.o.s.**, flashpoint more than 61 °C, highly corrosive	8	C1	I	Rule for collective entries not applicable to mixtures having components of UN Nos.: 1830, 1832, 1906 and 2308 !
3264	**Corrosive liquid, acidic, inorganic**	**n.o.s.**, flashpoint more than 61 °C, corrosive	8	C1	II	Rule for collective entries not applicable to mixtures having components of UN Nos.: 1830, 1832, 1906 and 2308 !
3264	Cupric chloride	aqueous solution, slightly corrosive	8	C1	III	Water
3264	Hydroxylamine sulphate	25% aqueous solution	8	C1	III	Water
3264	Phosphorous acid	aqueous solution	8	C1	III	Water
3264	**Corrosive liquid, acidic, inorganic**	**n.o.s.**, flashpoint more than 61 °C, slightly corrosive	8	C1	III	Rule for collective entries not applicable to mixtures having components of UN Nos.: 1830, 1832, 1906 and 2308 !
3265	Methoxyacetic acid		8	C3	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	**Corrosive liquid, acidic, organic**	**n.o.s.**, flashpoint more than 61 °C, highly corrosive	8	C3	I	Rule for collective entries
3265	Allyl succinic acid anhydride		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Dithioglycolic acid		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	**Corrosive liquid, acidic, organic**	**n.o.s.**, flashpoint more than 61 °C, corrosive	8	C3	II	Rule for collective entries
3265	Butyl phosphate	mixture of mono- and di-butyl phosphate	8	C3	III	Wetting solution
3265	Caprylic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Isovaleric acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Pelargonic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Pyruvic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
3265	Valeric acid		8	C3	III	Acetic acid
3265	**Corrosive liquid, acidic, organic**	**n.o.s.**, flashpoint more than 61 °C, slightly corrosive	8	C3	III	Rule for collective entries
3266	**Corrosive liquid, basic, inorganic**	**n.o.s.**, flashpoint more than 61°C, highly corrosive	8	C5	I	Rule for collective entries
3266	Sodium hydrosulphide	aqueous solution	8	C5	II	Acetic acid
3266	**Corrosive liquid, basic, inorganic**	**n.o.s.**, flashpoint more than 61°C, corrosive	8	C5	II	Rule for collective entries
3266	Sodium sulphide	aqueous solution, corrosive	8	C5	III	Acetic acid
3266	**Corrosive liquid, basic, inorganic**	**n.o.s.**, flashpoint more than 61°C, slightly corrosive	8	C5	III	Rule for collective entries
3267	**Corrosive liquid, basic, organic**	**n.o.s.**, flashpoint more than 61°C, highly corrosive	8	C7	I	Rule for collective entries
3267	2,2'-(Butylimino)-bisethanol		8	C7	II	Mixture of hydrocarbons **and** wetting solution
3267	**Corrosive liquid, basic, organic**	**n.o.s.**, flashpoint more than 61°C, corrosive	8	C7	II	Rule for collective entries
3267	**Corrosive liquid, basic, organic**	**n.o.s.**, flashpoint more than 61°C, slightly corrosive	8	C7	III	Rule for collective entries
3271	**Ethers**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
3271	Ethylene glycol monobutyl ether	flashpoint 61°C	3	F1	III	Acetic acid
3271	**Ethers**	**n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
3272	Acrylic acid tert-butyl ester		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Isobutyl propionate	flashpoint below 23°C	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Methyl valerate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Trimethyl ortho-formate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	**Esters**	**n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
3272	Ethyl valerate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Isobutyl isovalerate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	n-Amyl propionate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	n-Butylbutyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Methyl lactate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	**Esters**	**n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries
3287	**Toxic liquid, inorganic**	**n.o.s.**, flashpoint more than 61°C, highly toxic,	6.1	T4	I	Rule for collective entries
3287	**Toxic liquid, inorganic**	**n.o.s.**, flashpoint more than 61°C, toxic,	6.1	T4	II	Rule for collective entries
3287	Potassium fluoride	aqueous solution	6.1	T4	III	Water
3287	Sodium fluoride	aqueous solution	6.1	T4	III	Water
3287	Sodium nitrite	40% aqueous solution	6.1	T4	III	Water
3287	**Toxic liquid, inorganic**	**n.o.s.**, flashpoint more	6.1	T4	III	Rule for collective entries

UN No. (1)	Name (2)	Description (3)	Class (4)	Classification code (5)	Packing Group (6)	Standard Liquid (7)
		than 61°C, slightly toxic,				
3291	**Clinical waste**	**unspecified, n.o.s.**, liquid	6.2	I3	II	Water
3293	**Hydrazine**	**aqueous solution**, with not more than 37% hydrazine, by mass	6.1	T4	III	Water
3295	**Hydrocarbons**	**liquid, n.o.s.**, vapour pressure at 50°C more than 175 kPa	3	F1	I	Rule for collective entries
3295	**Hydrocarbons**	**liquid, n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	I	Rule for collective entries
3295	**Hydrocarbons**	**liquid, n.o.s.**, vapour pressure at 50°C more than 110 kPa but not more than 175 kPa	3	F1	II	Rule for collective entries
3295	3,3-Diethylpentane		3	F1	II	Mixture of hydrocarbons
3295	2,2-Dimethyl-3-ethyl-pentane		3	F1	II	Mixture of hydrocarbons
3295	2,3-Dimethyl-3-ethylpentane		3	F1	II	Mixture of hydrocarbons
3295	2,4-Dimethyl-3-ethylpentane		3	F1	II	Mixture of hydrocarbons
3295	2,4-Dimethylheptane		3	F1	II	Mixture of hydrocarbons
3295	2,6-Dimethylheptane		3	F1	II	Mixture of hydrocarbons
3295	3,3-Dimethylheptane		3	F1	II	Mixture of hydrocarbons
3295	4,4-Dimethylheptane		3	F1	II	Mixture of hydrocarbons
3295	4-Ethyl-2-methylhexane		3	F1	II	Mixture of hydrocarbons
3295	cis-3-Heptene		3	F1	II	Mixture of hydrocarbons
3295	trans-2-Heptene		3	F1	II	Mixture of hydrocarbons
3295	trans-3-Heptene		3	F1	II	Mixture of hydrocarbons
3295	Nonanes	isomeric mixture, flashpoint below 23 °C	3	F1	II	Mixture of hydrocarbons
3295	2,2,3,3-Tetramethyl-pentane		3	F1	II	Mixture of hydrocarbons
3295	2,2,3,4-Tetramethyl-pentane		3	F1	II	Mixture of hydrocarbons
3295	2,2,4,4-Tetramethyl-pentane		3	F1	II	Mixture of hydrocarbons
3295	2,3,3,4-Tetramethyl-pentane		3	F1	II	Mixture of hydrocarbons
3295	2,2,3-Trimethylhexane		3	F1	II	Mixture of hydrocarbons
3295	2,2,4-Trimethylhexane		3	F1	II	Mixture of hydrocarbons
3295	2,2,5-Trimethylhexane		3	F1	II	Mixture of hydrocarbons
3295	2,3,5-Trimethylhexane		3	F1	II	Mixture of hydrocarbons
3295	2,4,4-Trimethylhexane		3	F1	II	Mixture of hydrocarbons
3295	**Hydrocarbons**	**liquid, n.o.s.**, vapour pressure at 50°C not more than 110 kPa	3	F1	II	Rule for collective entries
3295	iso-Decanes	isomeric mixture, flashpoint between 23°C and 61°C	3	F1	III	Mixture of hydrocarbons
3295	2,3-Dimethyloctane		3	F1	III	Mixture of hydrocarbons
3295	2,5-Dimethyloctane		3	F1	III	Mixture of hydrocarbons
3295	2,7-Dimethyloctane		3	F1	III	Mixture of hydrocarbons
3295	4,5-Dimethyloctane		3	F1	III	Mixture of hydrocarbons
3295	3-Ethyloctane		3	F1	III	Mixture of hydrocarbons
3295	4-Ethyloctane		3	F1	III	Mixture of hydrocarbons
3295	4-Isopropylheptane		3	F1	III	Mixture of hydrocarbons
3295	2-Methylnonane		3	F1	III	Mixture of hydrocarbons
3295	1,2,3-Trimethylbenzene		3	F1	III	Mixture of hydrocarbons
3295	2,5,5-Trimethylheptane		3	F1	III	Mixture of hydrocarbons
3295	**Hydrocarbons**	**liquid, n.o.s.**, flashpoint between 23°C and 61°C	3	F1	III	Rule for collective entries

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The Directives of the European Community require the member states to apply the provisions of RID/ADR to all dangerous goods traffic in their territories.

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