



SLOVENSKI STANDARD
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**Konstruktivna lepila - Ugotavljanje roka uporabnosti večkomponentnih lepil
(ISO/DIS 10364:2026)**

Structural adhesives - Determination of the pot life and working life of multi-component adhesives (ISO/DIS 10364:2026)

Strukturklebstoffe - Bestimmung der Topfzeit (Verarbeitungszeit) von Mehrkomponentenklebstoffen (ISO/DIS 10364:2026)

Adhésifs structuraux - Détermination de la vie en pot et de la durée d'utilisation des adhésifs multicomposants (ISO/DIS 10364:2026)

Ta slovenski standard je istoveten z: **prEN ISO 10364**

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83.180 Lepila Adhesives

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Structural adhesives — Determination of the pot life and working life of multi-component adhesives

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Foreword

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

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

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 193, *Adhesives*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fifth edition cancels and replaces the fourth edition (ISO 10364:2024), which has been technically revised.

The main changes are as follows:

- The structure of the standard has been changed making it more user friendly. Each of the methods is now described in a separate clause containing the list of materials and equipment, a description of the procedure and the specific requirements for the content of the test report;
- The somewhat misleading information on the relevance of the respective methods of some methods has been adjusted;
- The option of mixing the adhesive components using a dual asymmetric centrifuge has been added;
- [Clause 3.1](#) pot life: definition adjusted;
- [Clause 3.2](#) working life: definition adjusted;
- [Clause 11](#): Method 6: Pot life - Determination from the change in wetting properties has been added;
- [Clause 12](#): Method 7: Pot life - Determination – from the change in tensile lap shear strength has been added;
- [Clause 13](#): Method 8: Working life - Determination – from the change in tensile lap shear strength has been added.

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

Structural adhesives — Determination of the pot life and working life of multi-component adhesives

SAFETY STATEMENT — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine any regulatory requirements prior to use.

1 Scope

This document specifies methods for determining the pot life of multi-part adhesives, in order to be able to determine whether the pot life conforms to the minimum specified working life required for a specific bonding process or to determine the reactivity of a multi-component adhesive as part of an incoming or outgoing goods inspection.

The different methods described in this document to measure the property do not necessarily provide identical results.

The test methods described are suitable for assessing all multi-part adhesives, and especially epoxy based and polyurethane based adhesives, but they may not be suitable for some acrylic-based adhesives.

NOTE 1 Some of the methods described in this document can also be suitable for determination of working life of one-part adhesives that react to humidity (e.g. PUR prepolymers).

NOTE 2 This document can also be used for assessing non-structural adhesives.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 472, *Plastics — Vocabulary*

ISO 2555, *Plastics — Resins in the liquid state or as emulsions or dispersions — Determination of apparent viscosity using a single cylinder type rotational viscometer method*

ISO 3219-2, *Rheology — Part 2: General principles of rotational and oscillatory rheometry*

ISO 15605, *Adhesives — Sampling*

ISO 4587, *Adhesives — Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies*

ISO 10365, *Adhesives — Designation of main failure patterns*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

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3.1

pot life

maximum time period, starting with the first contact of the components of a multi-component adhesive, within which the rheological properties of the adhesive allow it to be dispensed to the adherend and sufficiently wet both this and the adherends applied during joining; the steps to be carried out within the pot life are: dosing and mixing of the components, dispensing of the mixed adhesive to the adherend, joining and clamping the adherends

Note 1 to entry: The pot life varies with volume (more precisely with the surface to volume ratio of the tested adhesive sample), the temperature of the mixed adhesive and the ambient temperature.

3.2

working life

pot life plus the time interval within which the adherends can still be repositioned slightly by moving them parallel to each other after joining without adversely affecting the bond

Note 1 to entry: The pot life varies with volume (more precisely with the surface to volume ratio of the tested adhesive sample), the temperature of the mixed adhesive and the ambient temperature.

3.3

open time

maximum permissible time interval between the start of the application of the adhesive to the adherends and the completion of the joining process

[SOURCE: EN 923: proposed revised wording]

4 Significance and use

The pot life as well as the working life of a multi-component adhesive are important adhesive properties with regard to its processing. Even if the information about the pot life in the technical data sheets was originally intended to give the adhesive user an indication of how long an adhesive can be processed after mixing the individual components, methods have now also been established that allow to check the adhesive's reactivity as part of quality assurance, whether in outgoing or incoming goods inspection, but do not necessarily allow conclusions to be drawn about suitability for a specific bonding process.

The methods for measuring pot life described in this document do not give identical results. While some of these methods are primarily intended as a method for quality assurance in the context of incoming and outgoing goods inspection, others allow statements to be made as to whether the pot life of an adhesive is meeting the requirements of a specific bonding process. It should be expressly noted at this point that due to the numerous test conditions that influence the result of the pot life measurement, a comparison of the values is only possible if all the parameters listed in the sections on the test reports are taken into account.

Even if the test methods described are in principle applicable to all multi-part adhesive chemistries, especially epoxy based and polyurethane based adhesives the suitability of individual methods may be limited e.g. by the length of the pot life or the rheological behaviour of the respective adhesive.

- Method 1: Pot life - Determination from the change in apparent viscosity, (see [6](#));
- Method 2: Pot life - Determination from the change in extrusion rate, (see [7](#));
- Method 3: Pot life - Determination from the reaction temperature, (see [8](#));
- Method 4: Pot life - Determination by means of a drying recorder, (see [9](#));
- Method 5: Pot life - Determination by measuring the "snap time" , (see [10](#));
- Method 6: Pot life - Determination from the change in wetting properties, (see [11](#));
- Method 7: Pot life - Determination from the change in tensile lap shear strength, (see [12](#));
- Method 8: Working life - Determination from the change in tensile lap shear strength, (see [13](#)).

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In method 1, the pot life is determined from the increase in viscosity of the adhesive as it cures. This method is applicable to adhesives having a pot life of at least 5 min. It is particularly suitable as a quality test in the outgoing goods or incoming goods inspection. The informative value with regard to the suitability of a multi-component adhesive for a specific bonding process is limited to the influence of the curing reaction on the pumpability of the adhesive.

In method 2, the pot life is determined from the decrease in the mass of the mixed adhesive extruded under standard conditions in one unit of time. This method is applicable to adhesives having a pot life of at least 5 min. It is particularly suitable as a quality test in the outgoing goods or incoming goods inspection. The informative value with regard to the suitability of a multi-component adhesive for a specific bonding process is limited to the influence of the curing reaction on the pumpability of the adhesive.

In method 3, the pot life is determined as the time required for the mixed adhesive to reach a certain temperature, the so-called critical temperature, due to the exothermic nature of the curing reaction. This method is in principle applicable to all multi-part systems. It is particularly suitable as a quality test in the outgoing or incoming goods inspection, but it is almost not suitable to check whether or not the pot life of an adhesives is suitable for a certain bonding process.

In method 4, the pot life is determined by the time within the adhesive film still closes after a weighted needle is pulled through known as film formation time. In addition, the film drying time can be determined as the time from which the needle lifts out of the adhesive and continues gliding on the film surface without leaving any marks. This method is limited to low-viscosity, self-leveling multi-part adhesives and allows certain conclusions to be drawn about the suitability of the adhesive for a particular process.

NOTE This method is also applicable to one-component moisture-curing adhesives for determination of the open time.

In method 5, the pot life is determined as the change in string building, called snap time. This method is suitable for multi-part silicone, polyurethane, epoxy and methylmethacrylate adhesives. Other multi-part adhesives showing a similar flow behaviour and can be tested by snap time as well. The method allows certain conclusions to be drawn about the suitability of the adhesive for a particular process.

In method 6, the change in the ability of the adhesive to wet a surface is used to determine the pot life. The advantage of this method is that the pot life can be determined on a bead that is similar to the bead geometry intended for the bonding process in question. This method can be used for all multi-part adhesives that can be applied as a bead. It allows reliable statements to be made as to whether the pot life of a multi-component adhesive is suitable for a particular bonding process.

In method 7, the pot life is determined using tensile lap shear test specimens in accordance with ISO 4587. For this purpose, tensile lap shear test specimens are produced, whereby the joining is performed immediately as well as at different times after mixing the multi-component adhesive. The pot life is the maximum time after which no significant reduction in tensile tap shear strength or a significant increase in the proportion of adhesive failure is observed. This method, which is suitable for almost all multi-part adhesives, allows very reliable statements about whether the pot life of a multi-component adhesive is suitable for a particular bonding process due to the possibility of adapting the test conditions largely to the respective bonding process. The disadvantage of this method is the time required to carry out the determination.

In method 8, the working life is determined using tensile lap shear test specimens in accordance with ISO 4587. For this purpose, tensile shear test specimens are produced, whereby the joining is performed within the pot life of the multi-component adhesive. Immediately after joining and at different times after the joining, the adherends are moved parallel to the bonding surface to simulate an adjustment of the alignment. After complete curing, destructive testing is carried out. The working life is the maximum time after which no significant reduction in tensile tap shear strength or a significant increase in the proportion of adhesive failure is observed. This method, which is suitable for almost all multi-part adhesives, allows very reliable statements about whether the working life of a multi-component adhesive is suitable for a particular bonding process due to the possibility of adapting the test conditions largely to the respective bonding process. The disadvantage of this method is the time required to carry out the determination.

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5 Sampling

Each part of the multi-part adhesive shall be sampled, prepared and examined in accordance with ISO 15605. For each of the eight methods described in chapters 6 to 13, a sample quantity shall be taken that allows at least three tests to be carried out.

6 Method 1 — Pot life - Determination from the change in apparent viscosity

6.1 Materials

6.1.1 Solvent

Suitable for removing residues of the adhesive being tested from the devices used.

NOTE Acetone usually has a good cleaning effect on polyurethane or MMA adhesives, epoxy adhesives can often be removed well with isopropanol.

6.1.2 Cleaning wipes

Resistant to the solvent used, preferably disposable.

6.2 Apparatus

6.2.1 General

This section lists and describes the equipment required to determine the pot life using this method. The necessary dosing and mixing of the adhesive components can be carried out in different ways

- manual dosing and mixing;
- manual dosing and machine mixing;
- dosing from dual cartridge through a static mixer;

so that depending on the selected method, some of the listed items are not required. This is indicated accordingly.

6.2.2 Rotational viscometer

Independent of the dosing and mixing method used a rotational viscosimeter that should comply with the requirements of ISO 2555 or ISO 3219-2 is required.

6.2.3 Temperature control device

Independent of the dosing and mixing method used a temperature control device for conditioning the adhesive components to a specific temperature is required. This can be either a water bath or a temperature control chamber, each of which being capable of maintaining the desired temperature with an accuracy of $\pm 0,1$ °C.

When using a water bath, direct contact between the adhesive components and the water of the water bath shall be avoided.

Due to the risk of contamination of the adhesive components by water, adhesives supplied in dual cartridges shall not be thermally conditioned using a water bath.