

Storage of Organic Peroxides

in The Netherlands

Addendum to PSG 8 version 2011 in line with the

PGS 8 version 2020

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**EOPSG**

European Organic Peroxide Safety Group

A sector group of Cefic Shape

Description automatically generated

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# Introduction

A new version of the Dutch Guideline for storage of organic peroxides (the PGS 8) was published in 2020 (PGS 8:2020 version 0.2, April 2020). The most important substantive differences between the new and the previous version of the PGS 8 (PGS 8:2011 version 1.0, December 2011) are summarized in appendix U of the new publication.

The 2020 version is not translated into English. To make the new version also accessible outside the Netherlands, appendix U was translated into English. Together with the existing English translation of the 2011 version, this gives an up-to-date representation of the contents of the new PGS 8.

Section 3 of this Technical Bulletin contains the English translation of appendix U. The integral text of PGS 8:2011 is included in section 4 as an embedded file. And section 5 contains as embedded file the table of organic peroxides and storage classifications as included in the PGS 8:2020 version 0.2 (April 2020). It should be noted that this table may be updated in the future. The current table can be found on the next website: [www.publicatiereeksgevaarlijkestoffen.nl](http://www.publicatiereeksgevaarlijkestoffen.nl)

# Some remarks

* Additional information about appendix U is mentioned as notes at the bottom of the pages of section 3.
* In the new version of the PGS 8 each measure has a M-number. These numbers are mentioned in appendix U for reference to these measures.
* A number of measures contain substantive changes. The implementation periods for these changes are mentioned in appendix V of the new version of the PGS 8. Appendix U refers to this appendix V.
* If applicable, reference is made to the relevant section of the 2011 version for the changes listed in appendix U.

# Appendix U: Differences between the 2020 version and the 2011 version

**U.1 Introduction**

This PGS largely corresponds in terms of content to the previous version of this publication: PGS 8: 2011.

A number of measures are no longer included. This is because they do not arise from the risk assessment or have already been included in other legislation. A number of measures contain substantive changes. This was done on the basis of the risk analysis or new insights.

U.2 describes in general the main differences. Implementation periods apply to existing situations that do not yet comply with these measures. These deadlines are set out in Annex V.  
Measures that have not changed in terms of content have often been changed editorially. This happened because of PGS “New Style” format.

U.3 lists the measures that were deleted.

**U.2 Most important substantive changes**

*U.2.1 Reduction of safety distance for free-standing storage facilities possible due to fire resistance, fire protection installation or a combination of both (PGS 8:2011 reference: § 7.4).*

Safety distances must be maintained when storing organic peroxides. This is to protect objects from the consequences of incidents in the storage of organic peroxides. It concerns distances between storage facilities and other objects within the premises and between storage facilities and the boundary of the premises. The basic principle is that there are no effects outside the company's own premises.

It is not always possible to realize these safety distances. That is why it can be deviated from under certain conditions. These conditions have been adjusted with effect from this PGS. The adjustment means that a fire protection installation, such as a sprinkler or deluge installation, is not always necessary to reduce the safety distances. The safety distances can also be reduced with only sufficient fire resistance.

PGS 8: 2011 stipulates that reducing the safety distances is only allowed if the storage facility:

* has a fire protection system;
* has extra fire resistance if this is necessary for further reduction of the safety distances;
* withstand static internal overpressure in excess of the emergency pressure relief opening pressure.

When PGS 8: 2020 was drafted, it was determined on the basis of the risk assessment that this reduction can also be obtained by only adding extra fire resistance (i.e. without a sprinkler system). The basic principle is that a storage facility should be constructed in such a way that a fire in the storage facility is always limited to the relevant storage facility. Due to the rapid progress of a fire with organic peroxides, this can be achieved by sufficient fire resistance. The requirements for emergency pressure relief are included in the measures of 7.3.8 1).

In Germany, the rules for storing organic peroxides follow the same system. These are described in BG-Regulation B4 (1 January 2011) 2).

An important additional argument for opting for fire resistance instead of or in combination with a fire protection installation is the fact that a fire with organic peroxides is difficult to extinguish. The maximum effect of a fire protection installation is that the substances are cooled, and that the decomposition is delayed as a result. The possibility that a fire protection

*1) These measures have not changed in the new version of the PGS 8.*2) *Current version DGUV Vorschrift 13.*

installation extinguishes the fire completely and stops decomposition is considered small. In addition, a consequence of the use of a fire protection installation is that extensive extinguishing water collection is required. The same applies to a firefighting action by the fire brigade. In certain cases, a burnout scenario will be preferred.

*U.2.2 Storage facility - Requirements for strictest storage group (PGS 8:2011 reference: § 7.4)*

M3 (Storage facility – Requirements strictest storage group) indicates that the measures with regard to safety distances and the automatic extinguishing system for the strictest storage group apply to the entire storage. In PGS 8:2011 this only applies to the measures regarding safety distances (see PGS 8: 2011, §7.4).

For existing storage facilities with organic peroxides with different storage groups, this can be a tightening of the requirements for the automatic extinguishing system. An implementation period has therefore been included in Appendix V for this measure 3).

*U.2.3 Some storage situations may no longer only be adjacent to the outside wall (PGS 8:2011 reference: reg 5.5.1 and reg 5.6.1)*

M5 (Storage facility - Construction) indicates which type of storage facility is suitable for storing organic peroxides. There is a distinction according to storage group and quantity. For storages containing more than 30 kg and less than 150 kg of organic peroxides of storage group 1 and for storages containing more than 150 kg and less than 1 000 kg of storage group 2, 3 and 4, organic peroxides may only be stored as follows:

* in a free-standing storage facility;
* in a storage facility in a building if the storage is adjacent to a roof;
* against a building.

According to PGS 8:2011, a storage facility for these situations may also be located in a building and only adjacent to an outer wall.

For existing storage facilities, this may mean that relocation of the storage facility is necessary, or that the stored quantities should be reduced. An implementation period has therefore been included in Appendix V for this measure 3).

*U.2.4 Fire resistance from outside to inside for storage group 1, 2 and 3 (PGS 8:2011 reference: reg 5.5.4 and reg 5.6.7)*

M9 (Fire resistance of storage facility from outside to inside) indicates that integral storage facilities for more than 30 kg of organic peroxides must have a fire resistance from outside to inside of 60 minutes or more. This obligation arises from the risk analysis. In PGS 8:2011, a fire resistance of 60 minutes only applies to integral storage facilities for more than 150 kg of organic peroxides

This is a tightening for storage facilities with more than 30 kg, but less than 150 kg of organic peroxides. For existing storage facilities this may mean that structural modifications are required. An implementation period has therefore been included in Appendix V for this measure 3).

*3) Implementation period: 18 months from April 1, 2020.*

*U.2.5 Temperature monitoring (PGS 8:2011 reference: reg 5.5.10)*

M23 (Temperature monitoring) indicates that actively cooled or heated storage devices must have a temperature sensor for temperature monitoring. In PGS 8:2011 this measure only applies to storage facilities for 30 kg or more. In practice, all actively cooled or heated storage facilities will have such a temperature monitoring. Therefore, no implementation period has been included.

*U.2.6 Distance between packages and wall (PGS 8:2011 reference: reg 5.2.5)*

M27 (Storage facilities - Distance packages) indicates that the distance between packages and a wall must be at least 15 cm. This measure applies to all storage facilities for more than 150 kg of organic peroxides. In PGS 8:2011 this measure only applies to storage facilities for more than 1 000 kg of organic peroxides.

For existing storage facilities this may mean that they need to be reclassified or that they need to be enlarged to accommodate the necessary stock. An implementation period has therefore been included in Appendix V for this measure 4).

*U.2.7 Distance between pallets (PGS 8:2011 reference: reg 5.2.6)*

M28 (Storage facility - Distance pallets) indicates that the distance between pallets must be at least 10 cm. This allows good air circulation around packaging. This measure applies to all storage facilities for more than 150 kg of organic peroxides. In PGS 8:2011 this measure only applies to storage facilities for more than 1 000 kg of organic peroxides.

For existing storage facilities this may mean that they need to be reclassified or that they need to be enlarged to accommodate the necessary stock. An implementation period has therefore been included in Appendix V for this measure 4).

*U.2.8 Emergency pressure relief - Free space inside (PGS 8:2011 reference: reg 5.7.16)*

M33 (Emergency Relief – Free space inside) indicates that there must be a 50 cm free space on the inside of an emergency pressure relief. This measure applies to storage facilities for more than 150 kg. In PGS 8:2011 this measure only applies to storage facilities for more than 1 000 kg of organic peroxides.

For existing storage facilities this may mean that they need to be reclassified or that they need to be enlarged to accommodate the necessary stock. An implementation period has therefore been included in Appendix V for this measure 5).

*U.2.9 Emergency plan – Presence (PGS 8:2011 reference: reg 9.1.1)*

M70 (Emergency plan - Presence and content) indicates that companies with more than 2 500 kg of organic peroxides must have an emergency plan. It makes no difference whether cooling is required to store the organic peroxides. PGS 8:2011 requires an emergency plan for the following storage facilities:

* all refrigerated storage facilities;
* non-refrigerated storage facilities for more than 10 000 kg of organic peroxides.

For refrigerated storage this means more flexibility and for non-refrigerated storage it means more stringent requirements. An implementation period has therefore been included in Appendix V for the latter group 6).

*4) Implementation period: 6 months from April 1, 2020.*

*5) Implementation period: 18 months from April 1, 2020.*

*6) Implementation period: 12 months from April 1, 2020.*

*U.2.10 Dosing vessels - Temperature monitoring (PGS 8:2011 reference: reg 6.3.9)*

M81 (Dosing vessels - Temperature monitoring) specifies that dosing vessels for organic peroxides with a Tc lower than 30°C must have at least two temperature sensors with alarm function, one of which is independent of the refrigeration unit controller. This obligation arises from the risk analysis. In PGS 8:2011, the second temperature sensor is only required for dosing vessels for organic peroxides with a Tc of 20°C or lower.

For companies with dosing vessels, this may mean an adjustment of the temperature monitoring system. An implementation period has therefore been included in Appendix V for this measure 7).

*U.2.11 Dosing vessels - Automatic reporting high temperature alarm (PGS 8:2011 reference: § 6.3)*

M82 (Dosing vessels - Temperature alarm) indicates that the high temperature alarm for dosing vessels should report automatically according to measure M25 (Temperature alarm - Automatic reporting). This obligation arises from the risk analysis. In PGS 8:2011 this measure is not included for dosing vessels.

For companies with dosing vessels, this may mean an adjustment of the alarm system. An implementation period has therefore been included in Appendix V for this measure 7).

*U.2.12 Operational stock facility - Maximum quantity (PGS 8:2011 reference: § 5.8)*

M103 (Operational stock facility - Maximum quantity) indicates that an operational stock facility must not contain more than 1 000 kg of organic peroxides. Only type F organic peroxides are packaged in IBCs. That is why an exception has been made for one extra IBC in addition to the 1 000 kg permitted quantity. There is no maximum in PGS 8:2011. This is a tightening.

In practice, the amount in work stock rooms is unlikely to exceed 1 000 kg. Therefore, no implementation period has been included for this measure.

*U.2.13 Storage facility - Environment*

M57 (Storage facility - Surroundings) indicates that pallets and other combustible materials must not be within 2 m of a storage facility. This is not stated in PGS 8:2011. It's a tightening.

In practice, in the context of good housekeeping, a company will keep the environment of a storage facility free. Therefore, no implementation period has been included for this measure.

*U.2.14 Mixtures of organic peroxides - Determine SADT*

M45 (Organic peroxide mixtures - Determine SADT) indicates that prepared mixtures should be used as soon as possible. If this is not possible, the SADT must be determined so that it is clear at what temperature the mixture should be stored. This is a new measure resulting from the risk analysis.

This measure does not require any structural modifications or other measures that take a lot of time from an economic or practical point of view. Therefore, no implementation period has been included for this measure.

*7) Implementation period: 18 months from April 1, 2020.*

*U.2.15 Danger zone classification (PGS 8:2011 reference: § 0.2.4.1)*

M69 (Danger zone classification) indicates that a storage facility for organic peroxides must have a danger zone classification for explosion hazard. Because organic peroxides are chemically unstable substances, the directly effective rules for explosive atmospheres do not apply. However, this does not apply to the decomposition products of organic peroxides. These do fall under the directly effective rules for explosive atmospheres. This is described in PGS 8:2011, but no prescription is attached to it. The risk analysis has shown that setting a danger zone is necessary as a measure.

In practice, a company will have taken into account a danger zone when setting up storage facilities. Therefore, no implementation period has been included for this measure.

*U.2.16 Entry control temperature – Non-refrigerated peroxide reception*

M106 (Entry control temperature - Receipt of non-refrigerated peroxide) concerns organic peroxides that do not require refrigeration and that are placed in a refrigerated storage facility. On receipt of these organic peroxides, the temperature should be monitored. This is to prevent the organic peroxides already in the storage facility from heating up. This is a new measure resulting from the risk analysis.

This measure does not require structural modifications or other measures that take a long time from an economic or practical point of view. Therefore, no implementation period has been included for this measure.

*U.2.17 Change in storage classification (PGS 8:2011 reference: § 3.4.1)*

The storage classifications have changed for the following types of peroxides:

* Type D and E with burning rate ≥ 300 kg/min: group 2 becomes group 1;
* Type F with burning rate ≥ 300 kg/min: group 3 becomes group 2;
* Type F with burning rate 60 kg/min - 300 kg/min: group 3 becomes group 2.

*U.2.18 Use of ADR and GHS pictograms (PGS 8:2011 reference: § 5.3)*

M75 (Organic peroxides – Safety signs) concerns the safety signs required for the storage of organic peroxides. The use of ADR pictograms is required, but only in addition to the required GHS pictograms. This is a change from PGS8:2011.

**U.3 Measures that were deleted**

PGS 8:2011 contains a number of measures that are no longer included in PGS 8:2020. The risk analysis and assessment of this PGS have shown that these are not necessary. It is also possible that these measures have now been laid down in legislation or are considered good practice. The most important measures not included are:

* PGS 8:2011 – § 4.6.4: Certification of an UPD 8). In PGS 8:2020, the mandatory certification has expired. However, the UPD must be approved by the competent authority (see M62: Firefighting - UPD).
* PGS 8:2011 – reg 5.5.13: This states that fire extinguishers must be located within 15 m of a storage facility. This distance is no longer mentioned in PGS 8:2020. The distance should be tuned in to the environment of the storage facility. The point is that a starting fire in the area should be extinguished.

*8) UPD (Uitganspuntendocument) = a principles document for fire fighting installations, a so-called*

*Programme of Requirements or Inspection plan.*

* PGS 8:2011 – § 6.3: This states that dosing vessels themselves may not burn. In PGS 8:2020 the use of plastic dosing vessels, such as IBC’s is allowed.
* PGS 8:2011 – reg 8.1.8: This states that a company must apply the first in - first out principle. This is to prevent deterioration in quality. This measure is not reflected in PGS 8:2020. This principle is part of good practice, which is applied in all companies.

1. Integral text of PGS 8 2011 version (embedded)

The integral text of the PGS 8 2011 English version can be found in the below embedded file.



# Table Organic peroxides and storage classifications (embedded)

The table of organic peroxides and storage classifications as included in the PGS 8:2020 version 0.2 (April 2020) can be found in the below embedded file. It should be noted that this table may be updated in the future. The current table can be found on the next website: [www.publicatiereeksgevaarlijkestoffen.nl](http://www.publicatiereeksgevaarlijkestoffen.nl).

