



**SLOVENSKI STANDARD**  
**SIST EN 13285:2010**

**01-december-2010**

**Nadomešča:**  
**SIST EN 13285:2004**

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**Nevezane zmesi - Zahteve**

Unbound mixtures - Specifications

Ungebundene Gemische - Anforderungen

Graves non traitées - Spécifications

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**Ta slovenski standard je istoveten z: ~~SIST EN 13285:2010~~ EN 13285:2010**

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**ICS:**

93.080.20      Materiali za gradnjo cest      Road construction materials

**SIST EN 13285:2010**

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EUROPEAN STANDARD

EN 13285

NORME EUROPÉENNE

EUROPÄISCHE NORM

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ICS 93.080.20

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English Version

## Unbound mixtures - Specifications

Graves non traitées - Spécifications

Ungebundene Gemische - Anforderungen

This European Standard was approved by CEN on 29 July 2010.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 13285:2010 (E)****Foreword**

This document (EN 13285:2010) has been prepared by Technical Committee CEN/TC 227 "Road materials", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

This document supersedes EN 13285:2003.

The main change compared to the previous edition is that the former informative annex classifying mixtures containing recycled aggregates has been replaced by the general reference to EN 13242.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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

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## 1 Scope

This European Standard specifies requirements for unbound mixtures used for construction and maintenance of roads, airfields and other trafficked areas. The requirements are defined with appropriate cross-reference to EN 13242.

This European Standard applies to unbound mixtures of natural, artificial and recycled aggregates with a upper sieve size ( $D$ ) from 8 mm to 90 mm and lower sieve size ( $d$ ) = 0 at the point of delivery.

NOTE 1 Mixtures with an upper sieve size ( $D$ ) greater than 90 mm are not covered by this European Standard but may be specified in the place of use.

NOTE 2 Water content of the mixture and the density of the installed layer are not specified mixture requirements. Both parameters are related to the control of the construction of the layer and are outside the scope of this European Standard.

## 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 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

EN 1744-1, *Tests for chemical properties of aggregates — Part 1: Chemical analysis*

EN 13242, *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction*

EN 13286-1, *Unbound and hydraulically bound mixtures — Part 1: Test methods for laboratory reference density and water content — Introduction, general requirements and sampling*

EN 13286-2, *Unbound and hydraulically bound mixtures — Part 2: Test methods for the determination of the laboratory reference density and water content — Proctor compaction*

EN 13286-3, *Unbound and hydraulically bound mixtures — Part 3: Test methods for laboratory reference density and water content — Vibrocompression with controlled parameters*

EN 13286-4, *Unbound and hydraulically bound mixtures — Part 4: Test methods for laboratory reference density and water content — Vibrating hammer*

EN 13286-5, *Unbound and hydraulically bound mixtures — Part 5: Test methods for laboratory reference density and water content — Vibrating table*

## 3 Terms and definitions

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

NOTE Other useful terms and definitions are given in EN 13242.

### 3.1

#### **unbound mixture**

granular material, normally of a controlled grading with  $d = 0$ , which is generally used in pavement bases and sub-bases

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NOTE An unbound mixture does not contain an added binder.

**3.2****category**

level of a property expressed as a range of values or a limiting value

NOTE There is no relationship between the categories of different properties.

**3.3****grading**

particle size distribution expressed as the percentage by mass passing a specified number of sieves

**3.4****batch**

production quantity, delivery quantity, partial delivery quantity (railway wagon-load, lorry-load, ship's cargo) or stockpile produced at one specific time under conditions that are presumed to be uniform

NOTE With a continuous process the quantity produced during an agreed period is treated as a batch.

**4 Requirements****4.1 General requirements**

The need for testing for all properties in this clause shall be limited according to the particular application or end use or origin of the mixture. When required, the tests specified in 4.2 to 4.5 shall be carried out to determine appropriate properties.

NOTE When a test is not required, it should be specified as a "No requirement".

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**4.2 Aggregate requirements**

When required, the following properties of the aggregates used in the mixture shall be in accordance with EN 13242:

- shape of coarse aggregate;
- percentage of crushed or broken particles and of totally rounded particles in coarse aggregates;
- fines quality;
- resistance to fragmentation of coarse aggregate;
- particle density;
- water absorption;
- resistance to wear of coarse aggregate;
- chemical requirements;
- durability requirements.



### 4.3 Mixture requirements

#### 4.3.1 Mixture designation

Mixtures shall be selected from Table 1.

**Table 1 — Mixture designation**

0/8	0/10	0/11,2	0/12,5	0/14
0/16	0/20	0/22,4	0/31,5	0/40
0/45	0/56	0/63	0/80	0/90

#### 4.3.2 Fines content

When required, the percentage of particles which pass the 0,063 mm sieve (fines) determined in accordance with EN 933-1 shall not exceed the values in Table 2, according to the category chosen.

**Table 2 — Maximum fines content**

Percentage passing 0,063 mm sieve by mass	Category
$\leq 3$	$UF_3$
$\leq 5$	$UF_5$
$\leq 7$	$UF_7$
$\leq 9$	$UF_9$
$\leq 12$	$UF_{12}$
$\leq 15$	$UF_{15}$
No requirement	$UF_N$

When required, the percentage of particles passing the 0,063 mm sieve shall also be greater than the values given in Table 3, according to the category chosen.

**Table 3 — Minimum fines content**

Percentage passing 0,063 mm sieve by mass	Category
$\geq 2$	$LF_2$
$\geq 4$	$LF_4$
$\geq 8$	$LF_8$
No requirement	$LF_N$

The categories in Table 2 and Table 3 shall be chosen so that the difference between the maximum fines content and the minimum fines content is not less than 3 %.

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## 4.3.3 Oversize

When determined in accordance with EN 933-1, the percentage of particles passing the upper ( $D$ ) sieve shall lie within the ranges given in Table 4 according to the category chosen.

Table 4 — Oversize

Percentage passing by mass			Category
$2 D^{a,b}$	$1,4 D^b$	$D^c$	
—	100	90 to 99	$OC_{90}$
—	100	85 to 99	$OC_{85}$
100	— <sup>d</sup>	80 to 99	$OC_{80}$
100	— <sup>e</sup>	75 to 99	$OC_{75}$

<sup>a</sup> For aggregate sizes where  $D$  is greater than 63 mm, only the oversize requirements related to the  $1,4 D$  sieve apply because there is no ISO 565/R20 series sieve size larger than 125 mm.

<sup>b</sup> Where the sieves calculated as  $1,4 D$  and  $2 D$  are not exact sieve numbers in the ISO 565/R20 series then the next nearest sieve size shall be adopted. When  $D = 90$  mm the 125 mm sieve shall be used as oversize.

<sup>c</sup> The percentage passing sieve size  $D$  may be greater than 99 % but in such cases the supplier shall declare the typical grading.

<sup>d</sup> For aggregate sizes where  $D$  is smaller than 63 mm, add a range of 90 to 100 to the  $1,4 D$  sieve.

<sup>e</sup> For aggregate sizes where  $D$  is smaller than 63 mm, add a range of 85 to 100 to the  $1,4 D$  sieve.

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## 4.4 Grading requirements

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## 4.4.1 General grading curve

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When required, the percentage by mass passing sieve  $A$ , sieve  $B$ , sieve  $C$ , sieve  $E$  and where specified in Table 6 sieve  $F$  and sieve  $G$  determined in accordance with EN 933-1 using the sieves defined in Table 5 shall be within the overall grading range appropriate to the category selected from Table 6.

Table 5 — Sieves for grading

Mixture designation	Sieve A	Sieve B	Sieve C	Sieve E	Sieve F	Sieve G
0/8	4	2	—	1	0,5	—
0/10	4	2	—	1	0,5	—
0/11,2	5,6	4	2	1	0,5	—
0/12,5	6,3	4	2	1	0,5	—
0/14	8	4	2	1	0,5	—
0/16	8	4	2	1	0,5	—
0/20	10	4	2	1	0,5	—
0/22,4	11,2	5,6	2	1	0,5	—
0/31,5	16	8	4	2	1	0,5
0/40	20	10	4	2	1	0,5
0/45	22,4	11,2	5,6	2	1	0,5
0/56	31,5	16	8	4	2	1
0/63	31,5	16	8	4	2	1
0/80	40	20	10	4	2	1
0/90	45	22,4	11,2	5,6	2	1
NOTE	Table 5 does not define sieve C and sieve G for all mixtures.					

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In addition, for categories G<sub>A</sub>, G<sub>B</sub>, G<sub>C</sub>, G<sub>D</sub> and G<sub>E</sub> the mean value calculated from all gradings shall be within the supplier declared value grading range appropriate to the category selected from Table 6.