Cement Hranice

Technical list of Portland cement CEM I 52,5 R

February 2024

Cement Hranice

CEM I 52,5 R
Portland cement CEM I 52,5 R

Description:
CEM I 52,5 R Portland cement is manufactured in accordance with ČSN EN 197-1 ed. 2. It is a hydraulic binder in powder form manufactured by grinding together Portland clinker, calcium sulphate, additional constituents and ingredients. These constituents are specified technical standards EN 197-1, article 5. CEM I 52,5 R packaged Portland cement is supplied under the trademark TOPCEMENT®.

Composition of the Portland cement

Type of cement	Main constituent	Additional constituent
	Portland clinker	
CEM I	95-100%	0-5%

To said ratio of the components is not included calcium sulfate, which is added as a setting regulator, and additives facilitating cement production.

Characteristic features:
- very rapid increase in strength
- the highest initial strength of cement produced by Cement Hranice, a.s.
- the highest standardized strength of cement produced by Cement Hranice, a.s.
- high development of hydration heat in the process of setting and hardening

Quality, environment, safety and energy management:
- Quality Management Certificate according to ČSN EN ISO 9001
- Environmental Management Certificate according to ČSN EN ISO 14001
- Occupational Safety Management Certificate according to ČSN ISO 45001
- Energy Management Certificate according to ČSN EN ISO 50001

Use:
Used for demanding concrete, reinforced concrete building structures, small concrete blocks and large-sized parts which are subjected to very high mechanical loads. CEM I 52,5 R is suitable for concrete of higher strength classes (high strenght classes concrete) prestressed concrete, concrete requiring a very high initial strength with a view to rapid removal from the mould. Not suitable for massive concrete structures.

Method of delivery:
- bulk loaded in tank trucks or Uacs rail wagons
- packaged in paper bags of 25 kg on 1,4 ton EUR palletes covered with a shrinking foil

Additional information:
- this packed cement is subject to the notice of the Department of Environmental Hazards and Environmental Damages of the Ministry of Environment regarding the definition of terms included in point 47, paragraph 3 of Annex XVII to Regulation (EC) No. 1907/2006.
- the content of water-soluble hexavalent chromium (Cr VI+) shall not exceed 0,0002 % for a shelf life of 4 months provided that protection against exposure to water and high relative humidity (max. 75 %) is provided during storage – see national annexes NA.1
- ČSN EN 197-1 ed. 2. shelf life is 4 months from the date of dispatch, which is stated on the delivery, or. consignment note. At the same time, the condition must be observed that protection against the effects of water and high relative humidity (max. 75%) is ensured during storage - see national annexes NA.1 ČSN EN 197-1 ed.2.

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Technical parameters:

CEM I 52,5 R			
Parameter	Unit	EN 197-1 requirement	Average achieved values
Initial strength (1 day) (compressive strenght)	MPa	-	26,9
Initial strength (2 days) (compressive strength)	MPa	≥ 30	42,0
Standardized strength (28 days) (compressive strength)	MPa	≥ 52,5	69,1
Setting initiation	minutes	≥ 45	136
Volume stability (expansion)	mm	≤ 10	1,3
Loss on ignition	%	≤ 5,0	2,9
Insoluble residue	%	≤ 5,0	0,3
Sulphate content (as SO_3)	%	≤ 4,0	3,5
Chloride content	%	≤ 0,1	0,08

The given values are for information only and may differ from the values of the specific samples.

Usability of cements for the degree of environmental influence according to ČSN EN 206 +A2 and ČSN P 73 2404

Cement	Environmental influence degree																	
	corrosion risk free	corrosion caused by carbonation				corrosion caused by chlorides (other than seawater)			alternating freeze-thaw action				chemically aggressive environment			loss by abrasion		
	X0	XC1	XC2	XC3	XC4	XD1	XD2	XD3	XF1	XF2	XF3	XF4	XA1	XA2	XA3	XM1	XM2	XM3
CEM I	x	x	x	x	x	x	x	x	x	x	x	x	x	x[a)]	x[a)]	x	x	x

x ... usable for the given degree of environmental influence
a) under chemical sulfate aggression with the degree of environmental influence exceeding XA1 (concentration of sulfate ions SO_4^{2-} greater than 600 mg/l in the groundwater or 3000 mg/kg, optionally 2000 mg/kg in the natural ground) it is necessary to use the sulfate-resistant cement SR. With the content of SO_4^{2-} up to 1500 mg/l it is possible to use CEM I with adequate dose of puzzolant admixture (e.g. with at least 20% fly ash content). For other cases of influence of environment XA2 and XA3, such cement type is suistable.

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