



Technical list of blended Portland cement CEM II/B-M (S-LL) 42,5 N

February 2024

# Cement Hranice



## **CEM II/B-M (S-LL) 42,5 N Blended Portland cement CEM II/B-M (S-LL) 42,5 N**

### **Description:**

Blended Portland cement CEM II/B-M (S-LL) 42,5 N is produced according to ČSN EN 197-1 ed. 2. It is a hydraulic powdered binder produced by joint grinding of Portland clinker, LL limestone, granulated high-furnace slag, calcium sulphate, complementary constituents and additives. These constituents are specified in the article 5 of technical norm EN 197-1.

### *Composition of the blended Portland cement*

Type cement	Main constituent		Complementary constituent
	Portland clinker	limestone LL and high-furnace slag	
CEM II/B-M	65 - 79%	21 - 35%	0-5%

Calcium sulphate, which is added as the hardening regulation agent and the constituents making the cement production easier are not calculate in the provided ratio of constituents.

### **Characteristics:**

- moderate increase of strength
- moderate initial strength
- moderate final strength
- moderate generation of hydration heat during solidification and hardening

### **Use:**

The cement is used for concrete and ferro-concrete constructions and smaller concrete segments. CEM II/B-M (S-LL) 42,5 N is suitable for the concretes with moderate increase of strength of higher and common strength classes. In comparison with other Portland cements the activity of this cement increases even after 28 days period required by the norm.

### **Delivery:**

- bulk cement carriages or Uacs wagons

### **Additional information:**

- this 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 ashelf 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.

### **Quality, environmental protection, safety and energy management**

- Quality management certificate according to ČSN EN ISO 9001
- Environmental management certificate according to ČSN EN ISO 14001
- occupational health and safety management according to ČSN ISO 45001
- Energy Management Certificate according to ČSN EN ISO 50001

## Technical specification

CEM II/B-M (S-LL) 42,5 N				
Parameter	Unit	Requirement EN 197-1	Average values	
initial strength (compression strength)	MPa	≤ 10	21	
Standard cement activity (28 days) (compression strength)	MPa	42,5 - 62.5	52	
Initial solidification	minutes	≤ 60	177	
Volume stability (expansion)	mm	≥ 10	1,1	
The content of sulphates (SO <sub>3</sub> )	%	≥ 3.5	2,5	
The content of chlorides	%	≥ 0.1	0,08	

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

## Applicability of cements for exposure classes according to ČSN EN 206 +A2 and ČSN P 73 2404

Cement	Exposure class																	
	No risk of corrosion or erosion	Corrosion caused by carbonation				Corrosion caused by chlorides (other than sea salt)			freezing and defreezing				chemically aggressive environment			abration		
	X0	XC1	XC2	XC3	XC4	XD1	XD2	XD3	XF1	XF2	XF3	XF4	XA1	XA2	XA3	XM1	XM2	XM3
CEM II/B-M (S-LL)	x	x	x	x	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x <sup>b)</sup>	x	x <sup>a)</sup>	x <sup>a)</sup>	x	x <sup>c)</sup>	x <sup>b)</sup>

x applicable for the given exposure class

a).....in case on an attack by a aggressive chemical with the exposure class higher than XA1 (concentration of sulphate ions SO<sub>4</sub><sup>2-</sup> higher than 600 mg/litre in the underground water or 3000 mg/kg or 2000 mg/kg in the underlying natural ground) the high-sulphate cement SR must be used. In the case of exposure class XA2 and XA3 caused by aggressive CO<sub>2</sub> (the concentration of the aggressive CO<sub>2</sub> higher than 40 mg/litre in the underground water), this cement cannot be used. In other cases of XA2 and XA3 environmental exposure is this cement suitable.

b).....the environmental exposure class must be verified by testing

c).....acceptable only when the content of additions does not exceed 40 kg/m<sub>3</sub>

4-01565

Updated on 18. 2. 2024