

INSTRUCTIONS FOR THE PROCESSING OF CASTABLES

ŽÁROBET






Instruction refers to hydraulically bonded regular dense castables. (dle ČSN EN 1402-1).

The ŽÁROBET dry refractory castables have been designed for the production of monolithic lining and refractory prefabricated parts. The quality of refractory product made of these mixtures and thus its durability in operation is highly effected by the quality of the mixtures processing, their location, treatment and setting into operation. Therefore refractory castable mixtures shall be processed very carefully.

Preparation of refractory castable mixture

Delivered castable ŽÁROBET contains all compounds with the exception of water. Mixture is poured from bag into the prepared mixer and after one minute of mixing in dry condition specified quantity of water is added and the mixture is stirred for further 2-3 minutes until homogenous structure is reached.

Please read and apply the following instruction carefully:

-  Put always the contents of the whole bag into the mixer. Long preparation and handling can cause the separation of some components in the bag.
-  Charge water shall have quality of potable water. Industrial water is not allowed as wrong setting could occur.
-  The mixer and used tools shall be clean, rests of Portland cement and lime shall be removed.
-  Mixers with forced run of paddles are used above all. Common free-fall concrete mixers are less suitable, the mixture requires more charge water and the castable produced is of lower quality.
-  Exceptionally, if a smaller amount is required the mixture can be mixed manually - on a base, which does not suck water. The content of a bag or bags is dry mixed at first, then sprinkled with water and mixed perfectly.

Charge water

The contents of charge water influences the properties decisively, esp. strength as well as density and porosity. Top quality compact castable is obtained with min contents of water. Rising water contents increases porosity, decreases strength and prolongs the period of setting. The prepared mixture shall not be liquid; it can get liquefied during vibrations. Only a thin layer of cement wash can be on the surface after vibrating.

Mixture processing

Mixture processing means the location of the mixture on a certain spot (boarding, forms, moulds) and its consolidation. The form shall be firm (especially during vibrations) and easy-to-disassemble. The boarding should not suck water off from the wet mixture surface.

Consolidation is carried out by means of internal vibrator; also surface vibrator can be used. The elements are consolidated in moulds mostly on vibrating tables; an internal vibrator can vibrate bigger prefabricated elements.

Castable curing

The fresh placed consolidated castable shall be protected against excessive heat, frost, shocks and vibrations. Shocks and vibrations are not allowed during the period of setting. After setting and hardening the castable shall be protected against the evaporation of water from the surface and shall be kept moist. The castable shall be observed during setting and at the moment it is heated due to hydration to 45-50°C the surface or elements shall be permanently kept in wet conditions for min 3 days.

The most suitable procedure means that the castable elements are sprinkled after heating or are covered with a polyethylene sheet or wet bags after sprinkling. The castable shall be observed for min 24 hrs if its surface is not dried up.

The more compact castable is, the higher is the probability of higher achieved temperature and the more frequent sprinkling during the first 24 hrs is required.

Vice versa minor elements, the hydration heat of which is not high enough to warm up the produced element, should be laid together with the mould to a warm place, so that the hydration (i.e. setting) could proceed within the required time.

Removal of moulds

Boarding can be removed immediately after castable setting, obviously after 24 hours. Complicated structures (roofs, ceilings) after 35 - 40 hours. The moulds can be removed from an element usually after 4 - 6 hours in compliance with the conditions. This period depends above all on the temperature of used materials and ambient temperature of the environment where the castable sets.

Drying and putting into operation

Hard-set castable contains a part of charge water, i.e. about 6% of chemically combined water and a certain quantity of uncombined (free) water. The content of uncombined water varies according to the quantity of water evaporated during storage. Both combined and free water shall be removed during the first heating and putting the lining into operation. Drying and the first heating shall be carried out slowly, to allow water to disappear. Fast heating could cause the damage (cracking) of castable and decrease of its strength.

The speed of heating, drying and tempering of refractory monolithic lining is a difficult task depending on many factors as the mass of the lining, evaporated surface, speed of vapour exhaustion, compactness of used castable, etc. The designer usually specifies drying curves of the lining in new aggregates, during repeated procedures (repairs) it is usually carried out according to experience.

In the case of lack of experience with drying please contact our specialists or specialized companies.