Morcem 900

Morcem 900 is a high quality carbonaceous refractory cement which is supplied dry and merely requires mixing with water to be ready for use. It is extensively used in foundries and steelworks for many applications associated with jointing carbon or graphite-based materials, and can also be used for providing a protective coating for refractories in contact with molten metal.

Working Instructions

Mixing

The material readily lends itself to mixing manually in any convenient container. Water should always be added to the powder, the amount being dependent upon the intended application. As a general guide, when the material is to be used as cement, water should be added in the ratio of 1:4 by volume. In applications where it is essential to obtain a strong air set joint prior to firing, the material must be mixed with boiling water. If green strength is not important, cold water may be used.

Jointing

The surfaces to be joined should be brushed or blown free of dust and then 'wetted' but not soaked. This is particularly important where porous and unglazed surfaces are to be cemented. A thin layer of cement is then applied to both surfaces and the pieces squeezed together. Excess material which has exuded from the joint should be removed and the cement allowed to set. Care should be exercised in preventing the jointed parts from moving during the air setting period. This will vary from 1/2 hour for material mixed with hot water, to several hours for material mixed with cold water.

Drying

It is dangerous to permit molten metal to come into contact with any refractory material which has not been thoroughly dried, therefore cemented articles must be subject to a drying procedure. Ideally, where time and facilities are available, the cemented assemblies should be left to air dry overnight and then heated moderately in an oven or with a gas torch until they dry. Less effective alternatives are to dry the joint with a gas torch immediately or stand the pieces in a warm place for a prolonged period. Whichever method is adopted, the first heating of the joint to'redheat'should be done as slowly as possible.

Firing

The joint only attains its maximum strength after firing to temperature of about 1200°C. Therefore, care should be taken not to stress the joint until this temperature has been reached.

Cold Crushing Strength Measured on 25mm Cube				
Dried to	212°F	1112°F	1832°F	2192°F
kg/cm^2	123	125	179	506
P.S.I	1750	1820	2540	7251

Nominal Chemical Analysis			
	%		%
SiO_2	15	Fe_2O_3	6
SiC	30	B_2O_3	1.5
C	29	Na_2O	0.4
Si	13	K_2O	0.3
Al_2O_3	4	MgO	0.2
		CaO	0.6

Properties

Morcem 900 is a plumbago based material with added silicon carbide, providing a high strength refractory cement with excellent resistance to oxidation, metal penetration and slag attack. To achieve optimum results the material must be mixed and applied according to the 'Working Instructions'.

The following figures are based on average data obtained from current production quality control tests on the material.

Storage

It is recommended that the material is stored in a cool, dry place and that partially used sacks are resealed to prevent moisture pick up. Morcem 900 is a stock item and is supplied in 25kg paper sacks (Morcem 900D) and 7kg plastic buckets (Morcem 900E).

Morcem 2C/3C

MORCEM 2 is a two part, thermally conductive, high performance cement, specially developed by Morgan Molten Metal Systems for applications involving contact with liquid metals and slags. When mixed, a chemical hardening takes place, which does not need any additional drying or heating. There is a slight expansion and the hardened cement reaches a very high mechanical strength. It is suitable for applications where the temperature does not exceed 1650°C . MORCEM 2 cement is supplied in two parts, MCM2 a dry powder and MCM3 a liquid component.

Advantages

- Quick preparation of only a few minutes.
- Cold setting without drying and heating.
- Slight expansion of 1%.
- Very strong crushing strength, high refractory & high thermal conductivity
- Very high resistance to erosion by molten metals & liquid slags.
- Very high resistance to corrosive atmospheres.

Preparation

1. Ensure that the surfaces where MORCEM 2 cement will be applied are dry and free from any dust or solid particles.
2. Place the MORCEM MCM3 in a suitable plastic container.
3. Brush a coating of MCM3 onto the surfaces to be joined. This will accelerate the chemical setting of MORCEM 2 cement.
4 Mix the MCM2 powder with the liquid MCM3 left. The use of an electric mixer fitted with a centrifugal turbine wheel is recommended. (Rotation speed of 1000 rev/minute, to obtain a good mixture of MCM2 and MCM3).
5. The MORCEM 2 cement is now ready to use. Use the cement immediately.
6. Cold setting of the MORCEM 2 cement begins as soon as the mixture is ready. Use within 10 minutes of mixing for best results.
7. Keep the cement dry and vibration free for 24 hours to ensure maximum strength and properties.
8. MORCEM 2 cement can be used without drying or preheating.

Applications

MORCEM 2 cement can be used in many applications, especially in the iron and steel, non-ferrous and ceramic industries. These include:

- Jointing refractories with each other
- Coating for old refractories to protect them against attack by molten metals & fluxes. It also protects graphite pieces in the refractory against oxidation.
- Sticking of refractories to metals, sealing of thermocouple sheaths to steel tubes & also sticking refractories to refractories, refractories to ceramics & fibres to metals
- Coating by brushing or spraying on refractories, iron and steel. MCM3 can be used by itself for this application but gas firing is necessary to obtain a superficial hardening

Composition of MORCEM 2 cement before cold setting

Composition Before Cold Setting		
	Dry Powder	Wet Mix
SiC	43-45%	30%
Si	19-20%	13%
Al_2O_3	14-15%	10-15%
SiO_2	11-12%	8%
Alkali	2%	1.5%
P_2O_5	-	20-30%
	+ferrous and titanium oxides	+ferrous and titanium oxides

Typical conductivity values: 0.020 – 0.023 cal/cm/co/sec

Packing

MORCEM MCM2 cement is supplied in watertight plastic bags and the MORCEM MCM3 liquid hardener in plastic drums.

Packing		
	Packing No 1	Packing No 2
Morcem MCM2 Cement	15 KGs	5 KGs
Morcem MCM3 Liquid	4.5 Litre	1.5 Litre