NATIONAL ASSOCIATION OF CHIMNEY ENGINEERS

NACE CAST IN-SITU CONCRETE LINING SYSTEM

Customer Information

A domestic chimney lined in accordance with the National Association of Chimney Engineers (NACE) Cast in-situ Concrete Lining System (CCLS) - Code of Practice (N0160) is categorised as T450 N2 D 3 G under BS EN 1443 and so is suitable for all types of natural draught non-condensing gas, oil and solid fuel appliances.

Domestic masonry chimneys, either straight or with bends, can be lined using the NACE CCLS.

When used within a defective chimney the NACE CCLS will:

i. Reduce the leakage of air into the chimney.

ii. Eliminate the leakage of flue gases from the chimney.

iii. Insulate the flue to reduce the formation of combustion condensates.

The applicability of the NACS CCLS will be subject to the existing flue dimensions being sufficient to permit the proper installation of the correct flue size required by the appliance.

Description

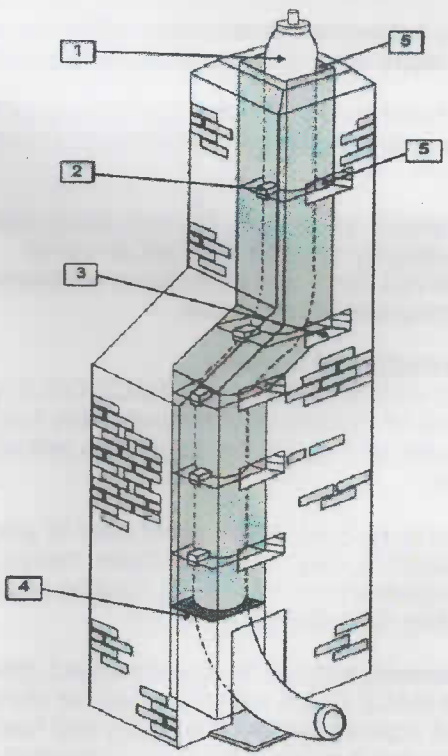
The NACE CCLS is one of a number of methods of lining a domestic chimney. It is generally used to line chimney systems of masonry construction and N0160 only covers this application.

The chimney must be inspected to establish its suitability for the NACE CCLS and if so thoroughly cleaned to remove all soot and tar deposits.

A specifically sized inflatable rubber former is inserted in the flue of the chimney and pressurised until it reaches the diameter required. The former is then centralised within the existing flue. This allows an even thickness of concrete around the former throughout the full length of the chimney.

Once centralised, the void around the former is filled with the approved and tested lightweight insulating concrete mixture.

The diagram shows that openings must be made to enable spacers (made of the same material as the finished lining) to be inserted. These openings are also used to pump in the concrete mixture and check progress of the installation.



1. Former inflated to the correct diameter.
2. Spacers inserted where required and at intervals to centralise the former and maintain a minimum thickness of concrete mixture
3. Temporary opening made at suitable intervals.
4. Shuttering at base of the flue.
5. Delivery hose from concrete pump is inserted at every opening.

Curing Period
Once the concrete is hard, the former is deflated and removed. There is a minimum curing period of 72 hours before any heat should be put into the flue.

During the curing period the base of the flue must be plugged to prevent any up draught that can lead to excessively rapid drying out.

The appliance should be used on low heat output for a heating up period of at least 7 days and then the intensity can be gradually increased over the next 7 days.

Durability
When installed in accordance with N0160, using the specified mix of concrete, the NACE CCLS is able to withstand the conditions found within a domestic chimney.

This is provided that the chimney is used and maintained according to the requirements specified within N0160 and was structurally sound before lining or was repaired as part of the lining process.

Any subsequent deterioration of the chimney structure may affect the integrity of the lining.

Experience shows that if the above conditions are satisfied, the lining will have an extended life.

However, as with any chimney lining system, its integrity must be checked at regular intervals and if any malfunction is observed, appropriate repairs made.

Strength and Stability
Any chimney in which the NACE CCLS is used must be capable of withstanding the loads placed on it during the installation and when in use.

The lining must not be relied upon to provide support to a structurally unstable chimney and if necessary remedial work must be undertaken before the installation.

However, within a structurally sound chimney, the NACE CCLS will strengthen the chimney and improve the integrity of any mid feathers provided they are adequately supported during the installation and curing process.

Thermal Insulation
The thermal insulation of a chimney lined with the NACE CCLS is greater than that of an unlined masonry chimney.

This will reduce the occurrence of flue gas condensate and deposit formation and is of particular importance when installing high efficiency appliances.

Maintenance
The chimney must be swept in accordance with a code of practice laid down by professional chimney sweeping organisations or in accordance with the information provided in relevant British Standards.

Failure to adhere to maintenance requirements could result in a chimney fire, which may cause damage to the liner.

The NACE CCLS must only be swept using a medium to soft polypropylene brush. The brush must be as near to the flue size as possible and never more than 10 mm greater than the nominal flue size.

METAL BRUSHES MUST NOT BE USED.

In the event that the flue becomes heavily tarred, a chemical cleaner (to molecularly change the nature and make up of the tar) may be used and then the flue can be swept as stated above to remove the debris formed.

The main factors that affect the frequency of chimney sweeping are:

Fuel Type
When burning bituminous coal it may be necessary to sweep the chimney 3 or 4 times a year. When burning smokeless fuel or oil, the chimney will still require sweeping a minimum of once a year.

Use
Where an appliance is in continuous use, particularly if operated at a low combustion rate for long periods, the flue may require more frequent sweeping.

Size of Flue
Where a flue serving an open fire has been lined to a diameter of 185 mm, the flue may require more frequent sweeping.

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