

Health and Safety Executive OC 690/12 (REV)

Field Operations Division

To

Factory Inspectors

FCG Specialist Inspectors (Elec, Process Safety)

SAFE OPERATION OF KILNS IN CERAMICS CRAFT STUDIOS

This revised 2-part OC draws attention to the attached information document (ID) which should be made available to ceramic craft studios and may be copied to other interested parties outside HSE such as educational establishments.

The ID outlines the safe operation of kilns in ceramic craft studios and discusses siting, insulation and operation of electric, gas and ad-hoc kilns.

1 This OC has been revised to include new information in the ID on the operation of gas kilns (see para 11, Gas kilns, sub para 8).

2 Ceramics Industry Advisory Committee (CIAC) guidance, *Safe operation of ceramic kilns*, (file 690), contains information of a fairly detailed technical nature on kiln safety and is aimed at commercial potteries.

3 To complement the information already available in the Institute of Materials guidance booklet, *Health and safety in ceramics: A guide for educational workshops and studios*, (file 690), the briefer and more condensed information in the ID may be of interest to people working in craft studios and educational establishments.

4 It is anticipated that further, more detailed guidance will be produced on Raku kilns which can present special hazards, and which are often also used in schools and colleges, and on the process of "reduction firing" referred to in the ID under the heading "gas kilns".

5 The Ceramics and Heavy Clay NIG would welcome any feedback from inspectors as to whether this ID is of use.

Cancellation of instructions

6 OC 690/12 - cancel and destroy.

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ASI headings

Craft: electric(ity): gas: kilns: pottery: ventilation.

Health and Safety Executive Information Document

HSE690/12 (REV)

SAFE OPERATION OF KILNS IN CERAMICS CRAFT STUDIOS

INTRODUCTION

1 This document contains internal guidance which has been made available to the public. The information may not be applicable in all circumstances and any queries should be directed to the appropriate enforcing authority.

2 Ceramic kilns are essentially simple and safe to use, provided that the proper controls and safety devices are fitted and that the safe method of working is fully understood.

3 Workers have been killed and property badly damaged in explosions through the ignition of unburnt fuel in gas-fired kilns. Gassing by carbon monoxide produced by incompletely burnt fuel also presents a serious risk, as do spillages of liquefied petroleum gas used as a fuel. With electric kilns, there is danger of electrocution, electric shock and burn injuries from heating elements and other conductors.

4 All these hazards are capable of control by correct design, siting and operation. Other than "ad-hoc" kilns, the correct design should have been ensured by the manufacturer.

SITING

5 Kilns should be sited with due regard to ventilation and heating, mechanical hazards, means of access, lighting and noise.

6 Adequate ventilation should be provided with free air movement (see para 11 for specific advice for gas kilns). A canopy to take heat and fumes from a kiln to the outside is desirable. Combustible equipment and materials should not be stored close to any kiln.

7 Most fires involving ceramic kilns occur at night, due to overheating of wood forming part of the construction of roofs/ceilings/floors above kilns. Adequate clearance should be maintained between hot surfaces and flue pipes and any part of the building structure. If this is not possible, other fire prevention precautions may be necessary.

8 In studios to which the public are admitted, a protective barrier, eg a metal cage is recommended for any kiln not sited in a separate room.

KILN INSULATION

9 Most modern kilns have refractory ceramic fibre as part of their construction. This should be treated with care. Inhalation of the fibre dust and contact with the skin should be avoided. The use of personal protective equipment, eg dust respirators may be necessary.

10 Older kilns may be insulated with asbestos materials. Specialist advice should be obtained if any work on a kiln which would expose or disturb asbestos is planned, or occurs accidentally. HSE can advise on the names of licenses asbestos contractors.

OPERATION

11 Operating instructions should be readily available with emergency instructions clearly displayed on or near to each kiln. Anyone who operates a kiln should have knowledge of the position, function and setting of all controls and safety devices, and be able to recognise faults and cope with abnormal or emergency situations. The points listed below are important considerations for electric, gas or ad-hoc kilns.

Electric kilns

- Convenient means of isolation from the electrical supply are required.
- Protection against overload and short circuits is required by suitably rated circuit breakers or fuses.
- Wiring to kiln and control panel should be suitably insulated (with heat-resisting insulation) and protected against damage.
- External metalwork should be effectively earthed.
- No access to live heating elements should be possible: this will require the kiln door to be interlocked with the power supply (usually by means of a trapped key or key exchange system).
- Any work on the electrical system should be undertaken only by a competent electrician.
- The kiln's electrical installation should be regularly inspected, particularly where plugs, sockets and flexible cables are used. It should be periodically tested to ensure that the earthing, insulation and connections are maintained in a safe and efficient condition.

Gas kilns

- A master isolation valve should be installed in the gas pipe supplying the kiln in a position where it can be safely operated.
- Each kiln should also have a lever-operated isolation valve on the gas control train inlet.
- Kilns should be purged with at least 5 times their volume of air before ignition is attempted. (For natural draught kilns, this can be achieved by leaving the door(s) standing open before light-up).
- Kiln doors should to be left open whenever practicable, until all burners are seen to be lit.
- Burners should be fitted with flame safeguard devices to cut off the gas supply if the flame goes out.

- Adequate combustion air should be available; grilles or cages over inlets should not be restricted or blocked and the room where the kiln is sited should be adequately vented.
- All gas kilns should be fitted with flues and correct draught conditions maintained at all times; natural draught flues should include a draught diverter to help avoid down draughts from the flue entering the kiln; extraction fans in forced draught flues should be interlocked to the gas supply.
- Any flue dampers should be locked in the fully opened position or interlocked with the gas supply, or otherwise cut away so that the flue is never more than two-thirds closed. Specialist advice should be sought from the kiln manufacturer/supplier before a kiln is used for "reduction firing" when the amount of combustion air is deliberately decreased to create a reducing atmosphere in the kiln containing toxic carbon monoxide.
- A kiln should not be used if there are signs of combustion products leaking from the flue, eg staining of nearby surfaces.
- Care should be taken with extractor fans used in kiln areas to ensure that combustion products are not drawn into the room.
- If liquefied petroleum gas (propane/butane) is used as a fuel, special care needs to be taken with storage of the gas [HSE guidance is available, ie (HS(G)34) *Storage of LPG at fixed installations*].
- Gas systems should be regularly maintained, preferably by a gas fitter employed by a CORGI-registered company or a specialist kiln engineer.

Ad-hoc kilns

- All ad-hoc kilns should be designed, constructed and installed with due regard to safety.
- Raku kilns, or kilns for salt glazing should never be operated indoors.
- Specialist kilns should only be operated by someone aware of the dangers involved.

12 Whatever type of kiln is being used, specialist advice, to ensure safe operation, may be sought from the kiln manufacturer, electricity or gas supplier, or the local office of the Health and Safety Executive. Further guidance is contained in the following publications:

Health and Safety in Ceramics: A Guide for Educational Workshops and Studios: Third Edition. Published by the Institute of Materials, Shelton House, Stoke Road, Shelton, Stoke on Trent, ST4 2DR. Price £6.00.

Safe Operation of Ceramic Kilns: Guidance Booklet published by the Health and Safety Executive and available from Dillons Bookstores and by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS. Price £6.50

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