POLLUTION PREVENTION AND CONTROL ACT 1999
POLLUTION PREVENTION AND CONTROL (ENGLAND AND WALES) REGULATIONS 2000

PERMIT OF PROCESS

THIS IS TO CERTIFY THAT THE NON-FERROUS METAL FOUNDRY PROCESS

at: **Taylors Eayre & Smith Bell Foundry, Freehold Street, Loughborough LE11 1AR**

National Grid Ref:: SK 5415 1980 (Plan No.1/020)
has been duly permitted in accordance with Regulation 10 of the Pollution Prevention and Control (England and Wales) Regulations 2000 subject to the conditions outlined in this document.

Name of Operator: Taylors, Eayre & Smith Ltd
Registered Office: Freehold Street, Loughborough, LE11 1AR
This Permit shall apply only to the premises occupied by the applicant, as specified and described in the Application for Permit submitted to the Borough of Charnwood. This Permit, consisting of thirteen pages, shall be subject to replacement, variation or amendment, as may be considered appropriate by the Borough of Charnwood at any time, according to provisions of Regulations 12, 15, and 17 of the Pollution Prevention and Control (England and Wales) Regulations 2000

The conditions contained herein shall apply from the date of the Permit unless otherwise stated.

Refer to Variation Notice Ref. No. 03/01 dated	21 March 2001
Refer to Variation Notice Ref. No. 01/06 dated	5 January 2006

Signed on behalf of Charnwood Borough Council Dated 5 January 2006

…… Counter-signed ……
(Delegated officer for the purpose)

Environmental Health, Southfields,, Southfield Road, Loughborough

Taylors Eayre & Smith Bell Foundry, Freehold Street, Loughborough

1.0 Process Description

1.1 Purpose of the Permitted Process

The process involves the melting and casting of bell metal in order to manufacture bronze church bells and hand bells and it falls within the definition of Schedule 1, Section 2.2, Part B (a) of the Pollution Prevention and Control (England and Wales) Regulations 2000 ("the Regulations"). National guidance on Best Available Techniques for the process are contained in the Secretary of State's Guidance Note PO2/8(04) 'Copper and Copper Alloy Processes' or any more recent revisions.

Some melting of ferrous metals also takes place to enable casting of headstocks. Based on the guidance in AQ5(92), the impact of this activity is considered trivial and as such no separate Permit is required for ferrous melting as defined in Schedule 1, Section 2.1 of the Regulations. The triviality status of the ferrous melting must be kept under review, given changes in operational activity or national guidance. Any activities involving ferrous melting and casting on the site are subject to the condition of this Permit.

1.2 Metal Melting and Casting

1.2.1 Plant Detail

The premises are located on the corner of Freehold Street and Cobden Street, Loughborough (See figure 1/20). Metal melting and bell casting is undertaken within the main foundry building (figure 2.20). Small clock and handbells are cast in the small casing workshop (figure 2/20).

The main plant and their respective emissions points are as follows:-

PLANT	EMISSION POINT
Morganite 500 tilting furnace	Fume and combustion products are discharged into the workspace and then to atmosphere via a louvred gable at the roof ridge
2.1/2 ton morganite tilting furnace	Fume and combustion products are discharged into the workspace and then

	to atmosphere via a louvred gable at the roof ridge
¾ ton morganite tilting funace	Fume and combustion products are discharged into the workspace and then to atmosphere via a louvred gable at the roof ridge
100 lb morganite lift-out furnace in small casting workshop	Emissions discharge at roof ridge level via a local hood canopy and stack.
Core and cast bake oven	Fuel combustion products are discharged to atmosphere via a brick stack serving the oven.

All emissions are discharged to atmosphere by passive ventilation.

All furnaces and the oven are fuelled by gas oil.

The operation of the reverberatory furnace does not fall within the remit of this Permit.

If the furnace is to be brought back into use then prior consent must be sought from both Charnwood Borough Council and the Environment Agency.

1.2.2 Operational Detail

Raw materials are ingots of bell metal (typically 77% copper, 22% tin, 1% other metal elements), reclaimed clean grey iron, high clay content resin bonded sand, chopped hay, horse manure, water, bricks and coke.

1.3 Church Bell Manufacture

A loam is produced by mixing sand, hay , manure and water. The inner core of the bell is formed from bricks, coke and loam. The outer case of the bell is formed from loam. The core and case is baked in the oven at 100°C to 150°C to dry and form the bell pattern.

The core and case are bolted together and buried in the sand floor of the foundry onto a bed of coke. Bronze ingots are melted in the furnaces, a willow pole is used to remove gaseous contaminants. Dross is skimmed off the surface of the molten metal and stored in bags within the building.

Metal is poured into the pattern through a reservoir at the head of the case. Fume and combustion products from the casting operation is vented out of the sand floor via a vent pipe at the top of which is a burning cotton rag.

After cooling, the case is removed and the core dug out. Materials from the case and core are stored for re-use. Any sand, manure and hay that is not re-used is stored in a skip within the foundry.

1.4 Hand Bell Manufacture

Moulds for hand bells are formed from green sand and are created from 3 sections in moulding boxes. Bronze ingots are melted into the lift-out furnace. Molton metal is poured directly into the moulds from a lift-out crucible. Following the casting the moulds are then taken apart and the sand returned for future use.

Excess metal from casting operations are removed and re-used. Manufactured and repaired bells are subject to some fettling and finishing in the workshops (figure 2/20). None of these operations produce emissions to atmosphere.

1.5 Headstock Manufacture

Typically, approximately 250kg of iron is melted each week for headstock casts, often in one or two batches. Scrap iron is cleaned or degreased before melting .

No lead is melted and no fluxes or degassing agents are added.

2.0 Emission Limits and Controls

2.1 All emissions to air other than steam or water vapour shall be colourless and free from persistent mist. All emissions to air should be free from persistent fume and droplets. In the case of all emissions, this condition relates to the emission points described in Clause 1.2.1

2.2 All emissions shall be free from offensive odour outside the process boundary as perceived by the Local Authority inspector.

2.3 Emissions from all combustion processes (excluding casting fume) shall be free from visible smoke and in any case shall not exceed the equivalent of Ringelman Shade 1, as described in the British Standard BS2742.1969.

2.4 Where emissions monitoring is required, emissions shall not exceed the following limits expressed as the maximum permissible 15-minute averages:

POLUTANT	CONCENTRATION
Total Particular Matter	50mg/m^3
Copper and its compounds (as copper	20mg/m^3
Lead and its components (as lead)	2mg/m^3
Nickel and its compounds (as nickel)	10mg/m^3
Tin and its compounds (as tin)	10mg/m^3
Fluoride and its compounds (as fluoride)	5mg/m^3

Emissions monitoring shall only be required in the event of confirmed breaches of Clauses 2.1 or 2.2 and only after a written instruction to carry out such monitoring has been issued by the local authority inspector.

Compliance with the emission limits for lead, nickel and fluoride are permitted to be demonstrated using other indicative data including metal content analysis.

Emissions monitoring will be required where metal alloys other than tin bronze is melted or otherwise processed in furnaces unless the total mass of such metals are less than 2% of the tin bronze melted on the site per annum. This shall only be required following a written instruction by the local authority inspector.

2.5 Where emissions monitoring is required the local authority shall be informed at least 7 days in advance of the monitoring exercise. This notification shall include information about the pollutants to be monitored and details of the methods and test standards to be followed.

2.6 All emissions monitoring exercise shall be expressed at reference conditions 273K and 101.3Kpa, without correction for a water vapour content.

2.7 The results of all periodic emissions monitoring exercises shall be forwarded to the local authority within 8 weeks of their completion. The results shall be accompanied by sufficient background information to allow the local authority inspector to assess the compliance of the monitoring exercise against the test standard followed.

3.0 Monitoring, Sampling and Measurement of Emissions

3.1 Historically, metal casting has not caused complaints or visible emissions from the foundry. A visual and olfactory assessment of emissions must be made on any occasion which a casting operating is undertaken which the operator considers may lead to unusual emissions. Examples of such occasions would be if there are any changes to raw materials or concern about scrap iron cleanliness. Any adverse results must be recorded in the log book required by clause 3.2 Appropriate remedial action must be taken to prevent any further abnormal emissions.

3.2 The results of all monitoring and inspections shall be recorded in a log book which shall be retained by the operator for a minimum of 4 years and made available for examination by the local authority.

4.0 Materials Handling

4.1 Stocks of dusty or potentially dusty materials shall be stored in manner that prevents wind whipping. Coke, sand and hay shall either be stored internally or in sealed bags externally.

4.2 Any processes likely to emit into the air any particulate matter shall be undertaken within either the foundry or the workshops. Such processes include casting and knocking out, oxy fuel cutting and fettling.

4.3 All residues produced from the process shall be stored in such a manner to prevent wind whipping. Waste loam, sand, dross, coke and any other friable material shall either be stored internally or externally in sealed bags or a covered skip.

4.4 Records of the scrap iron used for ferrous melting shall be retained by the operator. For each batch of ferrous metal melted a record shall be kept of:-

i) The quantity of iron used.
ii) A brief description of the type of scrap iron used.
iii) A brief description of any potential contamination in the scrap such as paint residue, oil or grease, and the measures taken to remove the contaminants

5.0 Process Controls

5.1 Baking of moulds and cores shall only be carried out in the bake oven in the foundry. Only low sulphur contents fuels (below 1% content by mass) shall be used to fire the oven. Routine inspections of emissions from the process shall include assessment of emissions from the bake oven.

5.2 The temperature of molten alloy in the furnace shall be monitored prior to each casting to ensure that it is within a range appropriate to minimise emissions of substances into the air. The temperature shall not exceed 1100^0C.

5.3 Combustion plant associated with the process shall be maintained and operated in a way which minimises any smoke emissions at the start-up or operation of relevant plant.

6.0 Dispersion of Emissions

6.1 The appropriate heights of the respective discharge points are as follows:-

i.) Roof ridge louvers approximately 11m.
ii.) 300mm diameter stack serving 100lb furnace approximately 8.5m
iii.) Baking oven stack approximately 12m

The heights of these stacks shall not be varied without prior consent of Charnwood Borough Council.

6.2 The chimneys serving the 100lb furnace and the baking oven shall not be fitted with any restriction at the final opening, such as a plate, cap or cowl.

6.3 The ductwork serving all of the discharge points shall be adequately maintained in order to ensure that emissions are discharged to atmosphere in a manner that maximises dispersion. Ductwork must be intact in order to prevent leakage and kept clear of blockages or accumulations that will interfere with gas flow.

6.4 Chimney heights and discharge arrangements are based on historical provision. These arrangements shall be reviewed in the event of relevant complaints to take into account guidance contained in HMIP technical guidance note D1 or any other appropriate guidance.

7.0. General Operations

7.1. Any malfunction or breakdown leading to abnormal emissions shall be dealt with promptly and process operations adjusted until normal operations can be restored. All such malfunctions shall be recorded in the log book (required under condition 3.2)). If there is likely to be an effect on the local community, the local authority shall be informed without delay.

7.2. External surfaces of the process building, ancillary plant and open yards and storage areas must be regularly cleaned whenever a build-up of matter is noted to prevent the accumulation of dusty material in circumstances where the dust may be come wind-entrained. Particular attention should be paid to roofs, gutterings, roadways, external storage areas and yards. Cleaning operations must be carried out by methods which minimise emissions of particulate matter to air, for example, by vacuum cleaning, wet cleaning or other appropriate techniques.

7.3. All other areas where there is regular movement of vehicles shall be kept clean, in order to prevent or minimise dust generation.

.

EXPLANATORY NOTES

These notes do not comprise part of Permit Serial No.020 but contain guidance relevant to the Permit.

1. You should note that Regulation 12(10) of the Regulations provides that in relation to any aspect of the process not regulated by conditions 1.1 to 7.3 the best available techniques ('BAT') shall be used for the purpose of preventing or, where that is not practicable, reducing emissions into the air.

   Section 3(7) of the Regulations describes 'BAT' as meaning the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole.

2. This Permit is issued under the Pollution Prevention and Control (England and Wales) Regulations 2000. The responsibility you have under legislation for Health, Safety and Welfare in the workplace remains in force. In addition, the Permit does not relieve you of your obligations to obtain planning permission, hazardous substances consent, discharge consent from the Environment Agency, Building Regulations approval, or a Waste Disposal Licence.

3. Any proposed 'change in operation' in the process (within the meaning of Regulation 2(1)) shall be notified to Charnwood Borough Council as required by Section 16(1) of the Regulations.