

消防處  
牌照及審批總區  
香港九龍尖沙咀東部康莊道一號  
消防總部大廈五樓



**FIRE SERVICES DEPARTMENT**  
**LICENSING & CERTIFICATION COMMAND**  
5/F, Fire Services Headquarters Building,  
No. 1 Hong Chong Road, Tsim Sha Tsui East,  
Kowloon, Hong Kong

本處檔號 OUR REF.: (19) in FP(LC) 314/07 Pt. 10  
來函檔號 YOUR REF.:  
圖文傳真 FAX NO.: 852 2723 2197  
電子郵件 E-mail: [lcpolice2@hkfsd.gov.hk](mailto:lcpolice2@hkfsd.gov.hk)  
電話 TEL. NO.: 852 2733 7619

7 June 2023

To: Recipients of FSD Circular Letters

Dear Sir/Madam,

**FSD Circular Letter No. 3/2023**  
**Specification of Gas Extraction System for**  
**Battery Room and Electrical Charging Facilities**

This Circular Letter serves to announce the revised specification of gas extraction system in battery rooms and electrical charging facilities, supplementary to the Code of Practice for Minimum Fire Service Installations and Equipment (September 2022) (the “CoP”).

Currently, the specification of the gas extraction system for battery rooms shall comply with relevant requirements set out in paragraph 8 - *Battery Rooms Mechanical Ventilating Systems*, of Part XI of FSD Circular Letter No. 4/96. With a view to enhancing fire safety standards in battery room and electrical charging facilities, a Sub-working Group joined by Ventilation Installation Liaison Group and Fire Safety Standard Advisory Group has conducted a holistic review on the requirements. The specification of gas extraction system has been revised with details provided in the Appendix of this Circular Letter.

The gas extraction system as required by the CoP would serve for reducing concentration of flammable vapour/gas, such as hydrogen, which may be released during charging of the battery, to below its lower explosion limit. The gas extraction system shall be inspected and tested to demonstrate the satisfactory performance including gas extraction flow rate, means of actuation, audio and visual indication for status monitoring and other requirements as specified and may be prescribed by this Department on the account of specific features of the system.

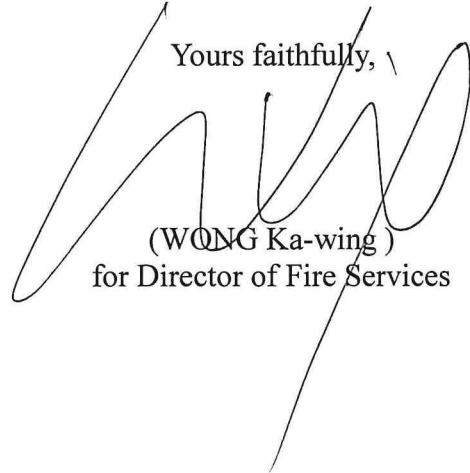
The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.

.../2

The paragraph 8 of Part XI of FSD Circular Letter No. 4/96 is hereby superseded and the revised specification shall be applicable to all developments with initial building plan submission received by this Department on or after 1 September 2023. Building plans submitted before 1 September 2023 are welcome to voluntarily adopt these revised requirements.

For enquiries, please contact our Fire Service Installations Division at 3961 5217 during office hours.

Yours faithfully, \

A large, stylized handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the bottom.

(WONG Ka-wing)  
for Director of Fire Services

Encl.

## Gas Extraction System for Battery Room and Electrical Charging Facilities

Appendix

### 1. Purpose

- 1.1 The Gas Extraction System referred herein is regarded as fire service installation as defined under Code of Practice for Minimum Fire Service Installations and Equipment.
- 1.2 The purpose of providing gas extraction system to battery room and electrical charging facilities is to reduce the concentration of flammable vapour/gas, such as hydrogen, which may be released during the charging of the battery, to below its lower explosion limit.
- 1.3 Gas extraction system shall be provided to dedicated battery room accommodating the following types of battery having total outputs of not less than 400 Ampere-hour:-
  - (i) Lead-acid;
  - (ii) Nickel-cadmium; or
  - (iii) Other types of battery evolving flammable vapour/gas during recharging of the battery.

### 2. Requirements for Dedicated Battery Room

- 2.1 All open type batteries regardless of size shall be accommodated in dedicated battery room.

### 3. Design Calculation

- 3.1 Gas extraction system shall be provided to battery room to keep the concentration of flammable vapour/gas below the safety limit.
- 3.2 The extraction rate shall be provided in accordance with one of the following:
  - (i) The safety limit of hydrogen gas concentration inside the battery room is 1% by volume maximum during the worst-case event of simultaneous “boost” charging of all the batteries.; or
  - (ii) The extraction shall be provided at a rate not less than 5.1 Litre/sec/m<sup>2</sup>) of the floor area of the room.
- 3.3 The design of the gas extraction system for this purpose shall follow the guidelines in BS EN IEC 62485-1, BS EN IEC 62485-2, NFPA1, NFPA111 or other acceptable international standards as agreed by the Director of Fire Services. In accepting gas extraction systems for battery system, the Director of Fire Services may require a set of design calculations to be submitted to substantiate that the gas extraction system has been properly designed to meet the above requirement.

#### 4. Technical Requirements

- 4.1 The ventilating fan shall be constructed of non-combustible material and the fan motor shall be of totally enclosed fan cooled (TEFC) type.
- 4.2 The gas extraction system for the battery room shall be independent to all other systems in the building. The extracted air shall be exhausted directly to open air.
- 4.3 Extraction points shall be located at the highest level of the room while air inlets shall be at low level. Extraction points and air inlets shall be so arranged that a “cross-flow” effect can be achieved in all areas within the room.
- 4.4 The gas extraction system shall be operated by means of continuous ventilation or electrically interlocked with the battery charger.
- 4.5 If the ventilation is not continuously provided, the ventilating fan motor shall be electrically interlocked with the battery charger so that the charger cannot be put in operation when the ventilating fan is not running. Electricity supply for the ventilating fan(s) shall be from an independent circuit other than that of the battery charger, and the interlock control relay shall be protected by an independent protective device.
- 4.6 If due to the functional requirement of the batteries, the condition in paragraph 4.4 cannot be met, alternative safety measures may be accepted but these must be agreed by the Director of Fire Services before installation.
- 4.7 All components of the gas extraction system shall be made of corrosion resistant materials.
- 4.8 The operation of gas extraction system shall not affect the operation of other fire service installations in case of fire.
- 4.9 The status of each fan comprising “Power Supply On”, “Fan Running” and “Fan Failed” are monitored and displayed at the local control panel. Audio and visual indication shall be provided at fire control panel to monitor the status of the gas extraction system.
- 4.10 If the gas extraction system ductwork passes through compartments, any part of the ductwork outside the serviced compartment shall be totally enclosed by fire resisting construction to BS 476: Part 20, to the same fire resisting period as the serviced compartment or the containing compartment whichever is the higher.

- 4.11 All ductwork designed to operate at static pressure in excess of 750 Pa, including builders work ducts or shafts and other construction shall, be pressure tested to Building and Engineering Services Association specification DW 143 or subsequent amendments. No pressure sensitive tapes shall be used for sealing.
- 4.12 Generally, there shall be no damper nor other restrictions in the ductwork or shafts. The exceptions shall be where enclosure integrity is required for effective operation of other fire service installations or at main exhaust louvre.
- 4.13 Cables used for gas extraction system shall comply with the same requirements of items 2 to 15 stipulated in Appendix 8 of the Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment (September 2022).

5. Inspection, Testing and Maintenance

- 5.1 The gas extraction system shall be inspected and tested to demonstrate the satisfactory performance including gas extraction flow rate, means of actuation, audio and visual indication for status monitoring and other requirements as specified and may be prescribed by Fire Services Department on the account of specific features of the system.
- 5.2 The system shall be maintained in efficient working order at all times and shall be inspected by a registered fire service installation contractor at least once in every 12 months.