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Federation

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水泥窑协同应急处置新冠肺炎医疗废物
技术规程

Code of practice for emergency co-processing of COVID-19 medical waste in
cement kiln

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Content

Preface	I
Introduction.....	II
1 Scope.....	1
2 Cited Standards.....	1
3 Terminologies and Definitions.....	1
4 Basic Requirement.....	2
4.1 COVID-19 Medical Waste Selection and Packaging.....	2
4.2 Treatment Qualification and Personnel Equipment.....	2
4.3 Organization Management and Communications.....	3
4.4 Training.....	3
4.5 Risk Assessment.....	4
5 Staff Protection and Health Condition Requirement.....	4
5.1 Selection of personal protective equipment.....	4
5.2 Wearing of personal protective equipment.....	4
5.3 Use of personal protective equipment.....	5
5.4 Personnel health management requirements.....	5
6 Operation Requirement.....	6
6.1 General Requirement.....	6
6.2 COVID-19 Medical Waste Treatment Flow Chart.....	6
6.3 Receiving and inspection.....	7
6.4 In-plant transportation.....	7
6.5 Storage.....	7
6.6 Unloading and conveying.....	7
6.7 Feeding into Kiln.....	8
7 Emergency response and Preparation.....	8
8 Pollution Control.....	9
8.1 Cement Product Safety Control.....	9
8.2 Flue Gas Control.....	9
8.3 Waste Water Control.....	10
8.4 Other Pollutants Control.....	10

9 Treatment Recording..... **10**
Appendix A COVID-19 Medical Waste Treatment Record.....**11**
Bibliography..... **12**

Preface

本标准按照 GB/T 1.1-2009 给出的规则起草。本标准由中国建筑材料联合会提出并归口。本标准起草单位：华新水泥股份有限公司、北京国建联信认证中心有限公司、北京建筑

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This standard follows GB/T 1.1-2009 (GB stands for China's National Standard). This standard is managed by China Building Materials Federation. This standard is drafted by China Huaxin Cement, ...

Introduction

2020 年初我国新冠肺炎疫情爆发，大量医疗废物需应急处置。多家水泥企业积极贯彻落实党中央、国务院统筹推进新冠肺炎疫情防控工作的决策部署，快速响应，发挥水泥窑协同处置温度高、病毒灭活彻底、无二次污染、处置安全、效率高和资源化利用等技术优势，配合政府及地方应急处置百余吨新冠肺炎医疗废物。

为总结水泥窑协同应急处置新冠肺炎医疗废物的经验，规范水泥窑协同应急处置新冠肺炎医疗废物流程，并为水泥窑协同应急处置类似医疗废物提供参考，特制定本规程。本规程属于指导性技术文件，旨在为水泥企业安全高效应急处置新冠医疗废物，杜绝病毒二次传播、传染，保障人体健康和环境安全提供技术指南。

Several cement producers are helping treat million tons of COVID-19 medical waste. The advantage of this co-processing treatment includes high temperature, complete virus inactivation, no secondary pollution, safe disposal, high efficiency, and resource utilization.

In order to summarize the experience of co-emergency treatment of COVID-19 medical waste in a cement kiln, standardize the process, and provide a reference for co-emergency treatment of similar medical waste in a cement kiln, this standard is formulated. This standard aims to provide technical guidance for cement enterprises to safely and efficiently treat COVID-19 medical waste, prevent further transmission of viruses, and protect human health and environment.

Code of practice for emergency co-processing of COVID-19 medical waste in cement kiln

1. Scope

本标准规定了利用水泥窑协同应急处置新型冠状病毒肺炎（以下简称新冠肺炎）疫情期间医疗废物的术语和定义、基本要求、人员防护及健康要求、运行要求、应急准备与响应、污染物排放控制要求、处置经营记录。

本标准适用于水泥窑协同处置新冠肺炎医疗废物（以下简称新冠医废）。其它类型的疫情、突发公共卫生事件产生的医疗废物处置可参照执行。

This standard specifies the terms and definitions, basic requirements, personnel protection and health requirements, operation requirements, emergency preparedness and response, and pollutant emission control of medical waste during the outbreak of COVID-19 during the emergency treatment of cement kiln Request and dispose of business records. The standard applies to COVID-19 medical waste. Medical waste of other virus or events can refer to this standard.

2 Cited Standards

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB 2626 呼吸防护 自吸过滤式防颗粒物呼吸器

GB 4915 水泥工业大气污染物排放标准

GB/T 11651 个体防护装备选用规范

GB 14554 恶臭污染物排放标准

GB/T 18664 呼吸防护用品的选择、使用与维护

GB 19082 医用一次性防护服技术要求

GB 19083 医用防护口罩技术要求

GB 19193 疫源地消毒总则

GB 19217 医疗废物转运车技术要求（试行）

GB 30485 水泥窑协同处置固体废物污染控制标准

GB 30760 水泥窑协同处置固体废物技术规范

GB 32166.1 个体防护装备 眼面部防护 职业眼面部防护具 第1部分:要求

HJ 421 医疗废物专用包装袋、容器和警示标志标准

HJ 662-2013 水泥窑协同处置固体废物环境保护技术规范

Here all the cited China national or sectorial standards are listed out.

3 Terminologies and Definitions

HJ 421 和 HJ 662-2013 界定的以及下列术语和定义适用于本文件。

3.1

水泥窑协同应急处置 emergency co-processing in cement kiln

将满足或经过预处理后满足处置要求的因突发事件而产生的固体废物投入水泥窑，在进行水泥熟料生产的同时实现对废物的无害化处置的过程。

注：改写 HJ 662-2013，定义 3.1。

3.2

新冠肺炎医疗废物 COVID-19 medical waste

感染新型冠状病毒的病人、疑似病人在医疗、隔离观察、诊断及其他相关活动中产生的具有直接或者间接感染性、毒性以及其他危害性的废物。

注：改写 HJ 421-2008，定义 3.4。

3.3

周转箱（桶）transfer container/barrel

医疗废物运送过程中，用于盛装经密封包装的医疗废物的专用封闭硬质容器。

注：改写 HJ 421-2008，定义 3.3。

4 Basic Requirement

4.1 COVID-19 Medical Waste Selection and Packaging

4.1.1 不应入窑协同处置《医疗废物分类目录》列出的如下废物：

The following wastes listed in the Medical Waste Classification Catalogue should not be co-processed in a kiln

- a) 病理性废物；Pathological waste
- b) 损伤性废物；Damaging waste
- c) 含汞和爆炸性成分、废弃氧化剂、有机过氧化物的化学性废物。Chemical waste containing mercury and explosive ingredients, waste oxidants, organic peroxides

4.1.2 周转箱（桶）应完整、无破损，并满足 HJ 421 的要求。

Transfer container/barrel should be complete and undamaged and followed HJ421 standard.

4.1.3 周转箱（桶）尺寸宜小于 600 mm×400 mm×300mm。

Size of Transfer container/barrel, 600 mm×400 mm×300mm

4.1.4 盛装新冠医废的包装袋和周转箱（桶）上应有标签，其内容应包括新冠医废的产生单位、产生部门、产生日期和类别等，并标注“新型冠状病毒肺炎”或“新冠肺炎”。

The packaging bags and transfer container/barrel containing COVID-19 medical waste should be labeled, and their contents should include the unit, department, date and category of the new crown medical waste, and be marked with " COVID-19 "

4.2 Treatment Qualification and Personnel Equipment

4.2.1 水泥企业基本条件 Qualification of cement enterprises

Cement enterprises should meet following requirements :

a) 经当地人民政府或环境保护主管部门批准，允许从事医疗废物处置；

With the approval of the local people's government or the environmental protection authority, medical waste disposal is permitted

b) 优先选择从事协同处置危险废物/生活垃圾/污泥/污染土壤业务一年以上的水泥窑；

Cement kilns that have been engaged in co-processing hazardous waste / domestic waste / sludge / contaminated soil for more than one year are preferred

c) 满足 HJ 662-2013 中 4.1.1、4.1.2 以及 4.1.3 d) 的要求。

Following the standard of HJ 662-2013

4.2.2 人员配备要求 Staffing requirements

运输车辆驾驶人员、押运人员、装卸作业人员，应取得相应的有效资质证件。从事新冠医废处置的作业人员应身体健康。处置企业的负责人应经主管部门安全培训合格，处置企业安全管理负责人应取得注册助理安全工程师及以上执业资格或安全工程专业中级及以上职称。

Drivers of transport vehicles, escorts, and loading and unloading operators shall obtain corresponding valid qualification certificates. Workers engaged in the disposal of COVID-19 medical waste should be in good health. The person in charge of the disposal enterprise shall pass the safety training of the competent department, and the person in charge of the security management of the disposal enterprise shall obtain the qualification of registered assistant safety engineer or above or the intermediate or above professional title in safety engineering.

4.2.3 防疫物资配备要求 Requirement of protection equipment

The COVID-19 waste treatment companies should be equipped with :

- a) 防护用品：呼吸防护、躯干防护、手部防护、眼面部防护、脚部防护等个人防护用品；

Protective equipment: respiratory protection, torso protection, hand protection, eye and face protection, foot protection, etc.

- b) 消毒用品：肥皂、消毒液、酒精等；

Disinfection supplies: soap, disinfectant, alcohol, etc.

- c) 其他设施：沐浴、隔离间等。

Other facilities: bathing, isolation, etc.

4.3 Organization Management and Communications

协同处置企业应成立以企业主要负责人为总指挥的新冠医废应急处置指挥部，指挥部应承担对外协调、运行处置、健康安全、后勤保障、事故应急等主要职责，应包括以下主要工作内容：

The waste treatment enterprise should set up a task force for COVID-19 waste emergency treatment led by the executive level person. The task force should assume the main duties of external coordination, operation and disposal, health and safety, logistical support, and emergency response. It should include the following main tasks:

- a) 与政府相关部门、医疗机构等联系新冠医废的收集、转运、接收、调度计划以及相关行政许可的办理；

Liaising with relevant government departments, medical institutions, etc. for the collection, transfer, reception, scheduling of COVID-19 medical waste, and related administrative licenses

- b) 新冠医废在处置企业厂区内应按照应急处置流程和注意事项进行管理和处置；

Medical Waste should be managed and processed in accordance with the emergency treatment procedures

- c) 个人防护用品、生产生活物资、医疗物资等应急物资的采购、发放和管理；

Procurement, distribution and management of emergency supplies such as personal protective equipment, production and living supplies, medical supplies, etc.

- d) 针对应急事故进行预防、准备并响应。

Prevent, prepare and respond to emergency incidents.

4.4 Training

协同处置新冠医废前应对相关作业人员进行专业技术、安全防护、医疗废物分类包装、紧急处理以及新型冠状病毒的传染性和防治措施等培训，培训合格后方可上岗操作。具体培训内容包括但不限于：

Before treating the COVID-19 medical waste, relevant operators are required to be trained in professional technology, safety protection, medical waste segregating and packaging, emergency treatment, and infectivity and prevention measures for COVID-19. Specific training content includes but is not limited to

- a) 有关医疗废物管理的法律和规章制度；Laws and regulations on medical waste management
- b) 医疗废物危险性方面的知识；Knowledge of the medical hazardous waste
- c) 医疗废物安全卫生处理和环境保护的重要意义；Significance of safe and hygienic treatment of medical waste and environmental protection
- d) 医疗废物的分类和包装标识；Classification and packaging of medical waste
- e) 新冠肺炎的传染、传播途径及预防措施；Transmission, Transmission and Prevention of COVID-19
- f) 劳动安全防护设施、设备的使用知识和个人卫生措施；Knowledge of labor safety protection facilities, equipment and personal hygiene measures
- g) 处理泄漏和其他事故的应急操作程序；Emergency procedures for handling leaks and other accidents
- h) 协同处置期间的临时管控制度及要求；Management control and requirements during co-processing operation
- i) 协同处置期间应急防控措施。Emergency prevention and control measures

4.5 Risk Assessment

所有参与当班/次新冠医废现场处置的作业人员，在当班作业前应书面进行处置作业任务风险分析。对工作任务风险分析中识别出的作业健康安全风险及预防控制措施应交流至每个作业参与人员，并确保其正确理解并承诺遵守执行。

All operators involved in the on-site medical waste co-processing operations shall conduct a risk analysis of the co-processing in writing before the on-duty operation. The work health and safety risks and preventive control measures identified in operation should be communicated to each operators and ensure that they understand correctly and commit to compliance.

5 Staff Protection and Health Condition Requirement

5.1 Selection of personal protective equipment

5.1.1 参与协同处置的作业人员应选用合适的个人防护用品，并满足以下要求：Operators involved in co-processing should select appropriate personal protective equipment and meet the following

requirements:

- a) 呼吸防护用品：应符合 GB/T 18664 或 GB 19083 或 GB/T 11651 或 GB 2626 的规定；

Respiratory protection: following certain national standards

- b) 躯干防护用品：应满足 GB 19082 中规定的除灭菌以外的其他所有要求；

Torso protection: following certain national standards

- d) 手部防护用品：手部应双重防护，里面戴医用手套，外面可选择工业用 38cm 以上加厚防化手套或防穿刺型手套；

Hand protection products: hands should be double-protected, and medical gloves should be worn inside. On top, thickened chemical-resistant gloves with 38cm+ or puncture-resistant gloves for industrial use can be used outside

- d) 眼面部防护用品：应选用符合 GB 32166.1 要求的职业眼面部防护具或符合 GB 2890 要求的面罩；

Eyes and face protection: following certain national standards

- e) 脚部防护用品：应选用符合相关标准的防化靴。

Leg and feet protection: following certain national standards

5.1.2 企业在正式处置新冠医废之前，应根据每日处置量，备用防护用品应不低于一周的储存量。The treatment company should estimate beforehand the amount of protection equipment and stock at least amount for one week consumption.

5.2 Wearing of personal protective equipment

5.2.1 作业人员的防护应达到卫生部门规定的一级防护要求，不应将鼻、嘴、眼及开放性创口皮肤暴露于作业环境。

Operators should be equipped with level 1 protection standard, and not expose nose, mouth, eyes and pen wound t o the working environment

5.2.2 作业人员在进入工作区之前，应在指定换衣场所完成防护用品穿戴。应遵循先身体后局部、先下后上、先内后外的原则，即穿戴顺序为防护服、防化靴（鞋套）、医用手套、呼吸器或抛弃式口罩、化学护目镜或全面罩、防化手套或防穿刺型手套。

Before entering the work area, operators should wear protective equipment at the designated changing place. Should follow the body first, then the body parts, first down, then up, first inside and then outside, i.e. the order of wearing is protective clothing, chemical protection boots (shoe

cover), and medical gloves, respirator or disposable mask, chemical goggles or full mask, chemical-resistant gloves, or puncture-resistant gloves.

5.2.3 防护服袖口应扎在医用手套内，防护服裤腿应放在防护靴之外以确保密合性。

Protective clothing cuffs should be tied in medical gloves, protective clothing pants legs should be placed outside protective boots to ensure tightness

5.2.4 防护用品穿戴好后，应进行作业人员互检及现场管理人员检查确认。

After the protective equipment is worn, the workers should perform mutual inspection and checked by on-site management personnel

5.2.5 工作区内未消毒前，作业人员不应移除任何个人防护用品。

Workers should not remove any personal protective equipment until the work area is disinfected

5.3 Use of personal protective equipment.

5.3.1 若作业人员佩戴自吸过滤式面罩，佩戴之前应完成面罩适合性测试并选择合适的型号，每次佩戴之后应做气密性检查。

If the operator wears a self-priming filter mask, the suitability test of the mask should be completed and selected the appropriate model before wearing, and the air tightness check should be performed after each wearing

5.3.2 作业人员佩戴呼吸器的过滤元件连续使用时间不应超过 8h，抛弃式口罩连续使用时间不应超过 4h，管理人员呼吸器的过滤元件使用时间不应超过 16h，抛弃式口罩使用时间不应超过 8h，如口罩内部湿润、脏污，或戴脱时接触到内侧面、没有正确储存等可能导致防护用品被污染的情况，应按要求更换。

The continuous use of the filter element of the operators' respirator should not exceed 8 hours, the continuous use of the disposable mask should not exceed 4 hours, the use of the filter element of the manager's respirator should not exceed 16 hours, and the use time of the disposable mask should not exceed 8 hours. If the inside of the mask is wet or dirty, or if it comes into contact with the inner side when worn, or is not stored properly, the protective equipment may be contaminated, which should be replaced as required.

工作区 Working area

5.3.3 防护用品应在指定区域移除，移除顺序宜为防化手套或防穿刺型手套、防护服、防化靴（鞋套）、化学护目镜或全面罩、医用手套、呼吸防护用品。移除时避免接触到外侧面，所有防护用品全部移除之后洗手或手部消毒，每次手部消毒不低于 5 次，洗手时间不低于 20s。

Protective equipment should be removed in the designated area. The removal order should be

chemical-resistant gloves or puncture-resistant gloves, protective clothing, chemical-resistant boots (shoe covers), chemical goggles or full-face masks, medical gloves, and respiratory protective equipment. Avoid contact with the outside of equipment when removing. Wash hands or disinfect hands after removing all protective equipment, disinfect hands no less than 5 times each time removing equipment, and wash hands no less than 20s.

5.3.4 废弃的不可重复的个人防护用品应立即装入医疗废物收集袋中密封保存，并尽快入窑焚烧销毁；可重复使用的化学护目镜或全面罩、防化靴、防化手套或防穿刺型手套等用品，可放入含有效氯（或溴）量 3000mg/L 消毒液内浸泡（15~30）min 或用 75%酒精全面擦拭至少 2 次。

Discarded non-repeatable personal protective equipment should be immediately sealed in a medical waste collection bag and fed into in a kiln for incineration and destruction as soon as possible; reusable chemical goggles or full-face masks, chemical protection boots, chemical protection gloves or puncture-resistant gloves and other supplies should be soaked in a disinfectant containing 3000mg / L of effective chlorine (or bromine) for 15 to 30 minutes or wipe thoroughly with 75% alcohol for at least twice.

5.4 Personnel health management requirements

5.4.1 人员健康管理要求 Personnel health management

作业人员的健康监护和管理应满足以下要求：Operators' health management should meet following requirement

- a) 建立作业人员个人健康监护档案；Setting up personal health monitoring files for operators
- b) 企业应为作业人员提供集中隔离居所，作业人员参与处置和隔离期间避免与非作业人员有密切接触；Enterprises should provide centralized isolation residences for operators, and avoid close contact with non-operators during their participation in disposal and isolation
- d) 企业应综合考虑现场作业劳动强度、作业环境、防护用品使用情况、生理需求等合理排班，当班作业时间不应超过 6h；

The enterprise should comprehensively consider the reasonable labor scheduling, such as labor intensity, operating environment, use of protective equipment, and physiological needs, and the working time of the shift should not exceed 6 hours.

- e) 企业应提供优质营养的膳食，保证如禽、蛋、奶、蔬菜的合理搭配；Enterprises should provide high-quality and nutritious meals to ensure a reasonable mix of poultry, eggs, milk, and vegetables
- f) 作业人员及管理人员返岗或返家前，均需隔离观察 15d 确定无新冠肺炎症状或疑似症状。Before resuming work or returning home, workers and managers should do quarantine for

15 days to confirm that there are no new symptoms or suspected symptoms of COVID-19.

5.4.2 人员心理健康管理要求 Personnel mental health management requirements

企业应关注作业人员的心理状态，如有严重失眠、多疑、易怒等异常，应提供心理咨询。

Enterprises should pay attention to the psychological state of operators, and provide psychological counselling if there is serious abnormalities such as insomnia, doubt, irritability, etc.

6 Operation Requirement

6.1 General Requirement.

6.1.1 新冠医废处置作业区(以下简称作业区)包括卸料和输送区、投加区，应设置隔离和警示标语等设施，非作业人员不准进入作业区。

At the COVID-19 waste treatment operation area (hereinafter referred to as the operation area) includes the unloading and conveying area and the adding area, facilities such as isolation and warning signs should be set up. Non-operators are not allowed to enter.

6.1.2 作业人员在作业期间不应离开作业区，如确实有需要，应移除所有个人防护用品并进行全面消毒后再离开。

Workers should not leave the operation area during the operation. If it is really necessary, all personal protective equipment should be removed and thoroughly disinfected before leaving.

6.1.3 作业区不应使用对讲机、手机，作业人员交流宜使用手语等信号语。

Walkie-talkies and mobile phones should not be used in the operation area. Operators should use sign language for communication.

6.1.4 新冠医废处置单位应配备消毒设施，对新冠医废运输车辆、卸料和输送设施、工具、周转箱(桶)、卸料和输送区内作业后的地面进行消毒。作业区污水收集入水泥窑高温区处置。

COVID-19 medical waste treatment units shall be equipped with disinfection facilities to disinfect medical waste transportation vehicles, discharge and transportation facilities, tools, transfer container/barrels, discharge and transportation areas and floors. Wastewater from operation area is collected and fed into cement kiln for high temperature treatment.

6.1.5 新冠医废作业区应就近提供方便作业人员使用的洗涤设施，有热水和肥皂等洗涤用品，每车处置操作完毕后立即进行手清洗和消毒，手消毒用 0.3% ~ 0.5% 碘伏消毒液或快速手消毒剂揉搓 (1 ~ 3) min。当日处置

操作完毕后洗澡。

The operation area should provide washing facilities convenient for operators to use, with hot water and soap and other washing supplies. Hand washing and disinfection should be performed immediately after the disposal of each vehicle. Use 0.3% to 0.5% iodophors for hand disinfection or rub with a quick hand sanitizer for (1-3) minutes. Take a bath on the day of operation.

6.1.6 消毒液浓度、消毒时间和方法应满足 GB19193 的要求。

Disinfectant concentration, disinfection time and method should meet the requirements of GB19193 (a national standard)

6.2 COVID-19 Medical Waste Treatment Flow Chart

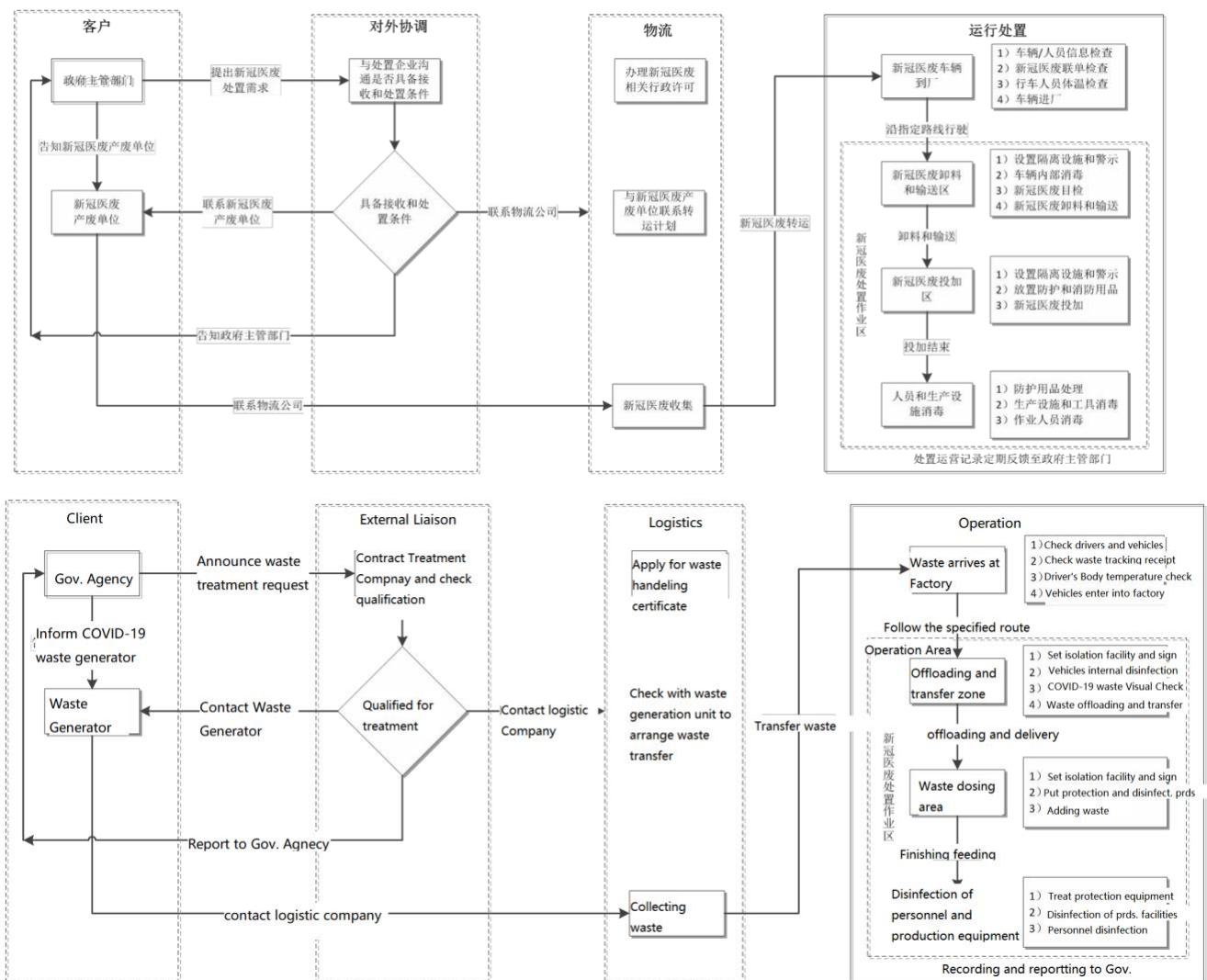


图 1 新冠医废处置作业流程图 Flow Chart of COVID-19 Waste Treatment

6.3 Receiving and inspection

6.3.1 运输车辆进厂后，运输司机与现场管理人员交接《新冠医废转移联单》，新冠医废包装物种类及数量确认无误后，核对记录车辆车牌号、司机以及押运等随行人员信息以及进厂时间。

After the transportation vehicle enters the factory, the transportation driver and the on-site management staff hand over the "COVID-19 Medical Waste Transfer Form". After confirming that the type and quantity of the packaging of COVID-19 Medical Waste is correct, check the vehicle license plate number, driver and escort information, and time entering the factory.

6.3.2 应遵守处置企业厂区的门卫管理制度，司机以及押运等随行人员应在指定区域活动，特殊情况除外。Should follow the doorman management system of the cement companies, drivers and escorts should move in designated areas, except in special circumstances.

6.4 In-plant transportation

6.4.1 运输车辆应符合 GB19217 的要求。

Transportation vehicles should follow GB19217

6.4.2 运输车辆进厂后应沿规定路线和指示牌行驶到达卸料和输送区，或在厂区管理人员引导下行车。

After entering the factory, the transportation vehicle should drive along the specified route and signs to the unloading and conveying area, or be guided down by the management of the factory area.

6.4.3 厂内运输过程中，厂区人员应远离或避开运输车辆。

During the transportation inside the factory, the personnel in the factory area should stay away from or avoid the transportation vehicles.

6.5 Storage

6.5.1 新冠医废原则上不应储存，运输车辆进厂后直接开往工厂指定区域后立即开始处置，不设储存设施。

COVID-19 medical waste should not be stored in principle. After entering the factory, the transportation vehicle will be directly directed to the designated area of the factory. Disposal and treatment should begin immediately without storage facilities.

6.5.2 如特殊原因不能及时处置，可在水泥厂内卸料和输送区以车代库暂时储存，时间不应超过 12h。

COVID-19 medical waste can be temporarily kept on the transportation vehicles in the discharge and transportation area of the cement plant, and the time should not exceed 12 hours, if it cannot be disposed of in a timely manner due to special reasons

6.6 Unloading and conveying

6.6.1 车辆货箱开门卸料前应对车体外部进行全面消毒，打开货箱门后应立即对车厢内进行初次目检。卸

料时应进行二次目检，确认包装完好，无遗撒、破损等情况。如出现轻微的包装破损和新冠医废遗撒情况，处置企业可在风险可控的情况下自行处理，如情况较为严重，则应拒收并退回。

The vehicle's cargo box should be fully disinfected before the car door is opened and unloaded. After the cargo box door is opened, the first visual inspection of the car compartment should be performed immediately. When unloading, a second visual inspection should be carried out to confirm that the packaging is intact, and there is no spillage or damage. If there is slight damage to the packaging, the treatment company can handle it on its own, or reject and return the waste, if the situation is more serious.

6.6.2 新冠医废卸料宜采取叉车、机械臂托盘小车等机械作业，输送宜采取提升设备，如采用电梯作为提升设备，运行期间非作业人员不得进入。

COVID-19 medical waste discharge should adopt mechanical operations such as forklifts, robotic arm pallet trolleys, etc. Non-operating personnel must not enter during operation, if lifting equipment, such as elevators are used.

6.6.3 新冠医废全部搬运出来后，应对货箱内部进行全面消毒，关上货箱门后应再次对车体外部进行全面消毒后车辆方可离开。

After offloading all the COVID-19 medical waste, the inside of the cargo box should be fully disinfected. After closing the cargo door, the exterior of the car body should be fully disinfected again before the vehicle leaves.

6.6.4 新冠医废卸料和输送区应靠近入窑投加设施。

COVID-19 medical waste discharge and conveying area should be close to the kiln feeding facility

6.7 Feeding into Kiln

6.7.1 投加设施应满足 HJ 662-2013 中 9.1 的要求，位置应选择窑尾高温段，包含分解炉、窑尾烟室至分解炉之间的上升烟道以及窑尾烟室；投加口应与新冠医废的包装尺寸或周转箱（桶）的口径尺寸相匹配。投加口应配置气密性装置，可采用双层锁风阀板控制，且任何时候应至少有一层阀板处于关闭状态。

Dosing facilities should meet the requirements of 9.1 in HJ 662-2013, and the location should choose the high temperature section of the kiln tail, including the decomposition furnace, the rising flue between the kiln tail smoke chamber and the decomposition furnace and the kiln tail smoke chamber. The packaging size of waste or the caliber size of the transfer container/barrel matches should fit with the inlet size. The inlet should be equipped with an air-tight device, which can be controlled by a double-layer air lock valve plate, and at least one layer of valve plate should be

closed at any time.

6.7.2 应在投加区2m以外选择合适位置，用于存放消毒用品、备用个人防护用品、备用水等，同时至少放置2瓶便携式手提干粉灭火器、1袋消防砂、1把消防铲及1个消防桶。

A suitable location should be selected 2 meters away from the dosing area for storing disinfection supplies, spare personal protective equipment, spare water, etc. At the same time, at least 2 bottles of portable dry powder fire extinguishers, 1 bag of fire sand, 1 fire shovel and 1 fire bucket should be available.

6.7.3 投加作业过程中不应对新冠医废包装袋进行拆包，宜使用工具直接投入入窑，不宜用手直接抓取医废包装袋。

During the dosing operation, the COVID-19 medical waste packaging bag should not be unpacked. It is advisable to use tools to directly put waste into the kiln, and it is not suitable to directly grab the medical waste packaging bag by hand.

6.7.4 投加速率以不超过1t/h为宜，每次投料间隔应不小于5min，投加的同时监测窑况、窑排放以及熟料质量波动情况。

The feeding rate should not exceed 1t / h, and the feeding interval should not be less than 5 minutes. Monitor the kiln condition, kiln discharge, and clinker quality fluctuations while feeding.

6.7.5 整车新冠医废投加完毕后作业人员应对投加区的地面和墙面以及投加设施进行消毒，然后按照5.3.4和6.1.5的要求进行防护用品移除、手清洗和消毒，并立即洗澡。消毒液的配制按照6.1.6。

After feeding all the waste in the vehicle, the operator should disinfect the ground and walls of the area and the installation facilities, and then follow 5.3.4 and 6.1.5 to remove protective equipment, wash and disinfect hands, and take a shower immediately. Disinfectant preparation according to 6.1.6.

7 Emergency response and Preparation

7.1 作业区如发生以下情况，应立即停止作业，消毒后到缓冲区更换新的防护用品，检查合格后方可返回工作区继续作业：

If the following conditions occur in the operation area, stop working immediately, replace new protective equipment in the buffer area after disinfection, and return to the operation area to continue work after inspection:

- a) 一次性防护用品（如防护服、防护手套等）破损；
Broken disposable protective equipment (such as protective clothing, protective gloves, etc.)
- b) 已正确佩戴呼吸器或抛弃式口罩，气密性检查通过后仍可闻到外界异味；
worn a respirator or disposable mask correctly, and but can still smell the outside odor after passing the air tightness test
- c) 污染液体喷洒到作业人员的过滤元件或抛弃式口罩上；
Contaminated liquid is sprayed onto the operator's filter element or disposable mask
- e) 新冠医废或液体直接倾倒或喷洒在作业人员身体上；
COVID-19 medical waste or liquid is poured or sprayed directly on the operator's body

7.2 如发生水泥窑突然跳停的情况，应立即采取以下应急措施：

In case of sudden outage of cement kiln, the following emergency measures should be taken immediately

- a) 投加区作业人员停止新冠医废投加，卸料和输送区作业人员停止新冠医废卸料和输送；
Operators in the dosing area stopped medical waste dosing, and workers in the unloading and transportation area stopped medical waste unloading and transportation
- b) 工厂负责人应于 1h 内判断重新开窑所需时间，如不超过 12h，新冠医废在卸料和输送区以车代库暂时储存，待重新开窑后继续处置；如超过 12h，对外协调人员应告知政府主管部门，并服从其调度将剩余新冠医废转移。
The person in charge of the factory should determine the time required to reopen the kiln within 1 hour. If reopening does not exceed 12h, COVID-19 medical waste can be temporarily stored in the transportation vehicle in the unloading and conveying area, and will continue to be treated after reopening the kiln. If reopening exceeds 12h, external coordination personnel should inform the government authorities and obey their schedule to transfer the remaining medical waste

7.3 新冠医废在厂内运输、卸料、输送过程中发生翻车或提升设备坠落导致新冠医废大量溢出、散落时，以及作业人员在作业区发生外伤或疑似感染事件时，应立即采取以下应急措施，必要时请求当地公安交警、环保部门、卫生部门或城市应急联动中心的支持：

When a large amount of COVID-19 medical waste is dropped or scattered during transportation, unloading, or transportation in the factory, or when the operator has a trauma or suspected infection in the operating area, the following emergency measures should be taken immediately. If necessary, request the support of the local public security traffic police, environmental protection department, health department or urban emergency linkage center:

- a) 应立即隔离发生外伤或疑似感染的作业人员并报告，同时采取必要的医疗保障措施；

Workers with trauma or suspected infection should be immediately quarantined and reported with necessary medical treatment

- b) 应对新冠医废大量溢出、散落而污染的地面实施隔离，其他车辆和人员不得进入；
The contaminated floor by the COVID-19 medical waste should be isolated. Other vehicles and personnel must not enter.
- c) 应对溢出、散落的新冠医废迅速进行收集、清理和消毒，对于液体溢出物采用吸附材料吸收；
Quickly collect, clean up and disinfect COVID-19 medical waste that spilled and scattered, and absorb the liquid spill with absorbent material
- d) 如果在操作中，作业人员的身体（皮肤）不慎受到伤害，应及时采取措施，并到医院接受救治。
If the operator's body (skin) is accidentally injured during the operation, should take measures in time and go to the hospital for treatment.

7.4 对发生的事故采取 7.3 给出的应急措施的同时，处置单位应向当地环保部门和卫生部门报告事故发生情况。事故处理完毕后，处置单位应向上述两个部门写出书面报告，报告的内容包括：

While taking the emergency measures given in 7.3, the disposal unit shall report the accident to the local environmental protection department and health department. After the accident is dealt with, the disposal unit should write a written report to the above two departments. The content of the report includes

- a) 事故发生的时间、地点、原因及其简要经过；
Time, place, cause and brief description of the accident
- b) 新冠医废泄露、散落、外伤或疑似感染的类型和数量以及新冠医废产生单位名称；
Types and quantities of leaked, scattered, trauma, or suspected infections of medical waste and the name of the unit generating medical waste
- c) 新冠医废泄露、散落、外伤或疑似感染事件已造成的危害和潜在影响；
Hazards and potential impacts of COVID-19 medical waste, due to leakage, scattering, trauma, or suspected infection
- d) 已采取的应急处理措施和处理结果。
Measures taken and results

8 Pollution Control

8.1 Cement Product Safety Control

8.1.1 协同应急处置新冠医废水泥窑生产的熟料产品，其质量应符合国家相关标准，并按照国家相关标准规

定进行检测。

The quality of clinker products of emergency co-processed COVID-19 medical waste in Cement Kiln should comply with relevant national standards and be tested in accordance with relevant national standards

8.1.2 协同应急处置新冠医废水泥窑生产的熟料产品中可浸出重金属含量应满足 GB30760 的限值要求。

The content of leachable heavy metals in clinker products shall meet the limit value requirements of GB30760

8.2 Flue Gas Control

8.2.1 水泥窑协同应急处置新冠医废的烟气排放应满足 GB 30485、GB 4915 及地方环保要求。

The flue gas emission of the co-processing should meet GB 30485, GB4915 and local environmental protection requirements

8.2.2 水泥窑及窑尾余热利用系统排气筒总有机碳 (TOC) 因协同处置固体废物 (包含新冠医废) 增加的浓度应满足 GB 30485 的要求。

The increased concentration of total organic carbon (TOC) in the exhaust pipe of the cement kiln and the waste heat utilization system of the kiln due to the co-processing of solid waste (including medical waste) should meet the requirements of GB 30485.

8.3 Waste Water Control

Follow 6.1.4

8.4 Other Pollutants Control

新冠医废进厂后应在规定时间内尽快处置，避免恶臭产生。协同应急处置的水泥生产企业厂界恶臭污染物限值应符合 GB 14554 的要求。

COVID-19 medical waste should be disposed of as soon as possible after entering the factory to avoid malodor. The fouling pollutants of co-processing shall meet the requirements of GB 14554

9 Treatment Recording

9.1 应对新冠医废的接收、处置、设施和工具消毒、设施维保、人员培训、个人防护用品发放等记录进行填写并备案。

Records of receipt, disposal of COVID-19 waste, facility and tool disinfection, facility maintenance, personnel training, and release of personal protective equipment should be documented.

9.2 相关记录 (参见附录 A) 的保存期应不少于三年 , 至少包括以下内容 :

Relevant records (see Appendix A) should be kept for at least three years, including at least the following

- a) 风险评估情况 ; Risk assessment
- b) 新冠医废接收和检查情况 ; Receipt and inspection of COVID-19 waste
- c) 新冠医废处置情况 ; Treatment status of COVID-19 waste
- d) 设施和工具消毒情况 ; Facilities and tools disinfection
- e) 设施维保情况 ; Equipment maintenance
- f) 事故应急和调查情况 ; Accident emergency and investigation situation
- g) 个人防护用品采购、发放、处置情况 ; Purchase, distribution and disposal of personal protective equipment
- h) 人员培训情况 。 Training

附录 A

(资料性附录) 新冠医

废处置运营记录表

新冠医废处置运营记录表见表 A.1。

表 A.1 新冠医废处置运营记录表

No.	Item	Forms to be filled	Recording frequency
1	Risk assessment (4.5)	Risk assessment	Once every shift
2	Receipt and inspection of COVID-19 waste (6.3)	Transport vehicle info, personnel info, quantity and Type, incoming and outgoing time record	Daily
		Medical waste transfer tracking records	
3	Treatment status of COVID-19 waste (6.7)	Persons, time, amount, no. of Transfer container/barrel	Daily
4	Facilities and tools disinfection (6.1.4、6.1.5)	Facilities and tools	Daily
		Transfer container/barrel	
5	Equipment maintenance	Offloading and transfer equip.	Reporting when happen
		Dosing equipment maintenance	
6	Accident emergency and investigation situation (7)	Accident emergency and investigation	Reporting when happen
7	Purchase, distribution and disposal of personal protective equipment (5.1、5.3)	Procurement and use records	Reporting when happen
		personal protective equipment	
8	Training (4.4)	Time, venue and content	Reporting when

注 1：除要求打印为纸质版现场记录的表格外，其余需要签字的表格可采用电子版填写后打印签字。

注 2：纸质版填写记录表及时整理为电子档后留存，填写电子版的记录表定期打印为纸质版留存。

注 3：以上记录表格仅供参考，企业根据实际需要可增加其他记录表格。

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-