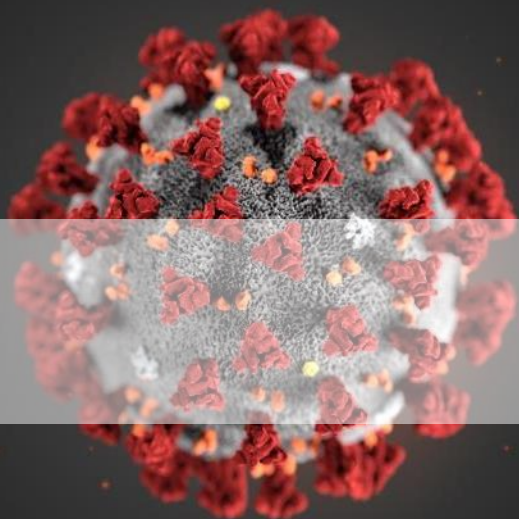


# Medical Waste Treatment

## Under Novel Coronavirus (COVID-19)

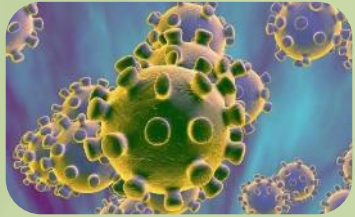


March 2020

Gient Heating Industry Co., Ltd



# Medical Waste Problems Brought by Novel Coronavirus



The sudden outbreak of epidemic is a **great challenge** for public health defense system in a region.

During the epidemic, **medical waste in Epicenter Wuhan increased 2-3 times**, from **50 to 110-150 ton** per day.

**However**, the medical waste treatment capability of Wuhan is **only 50 ton** per day

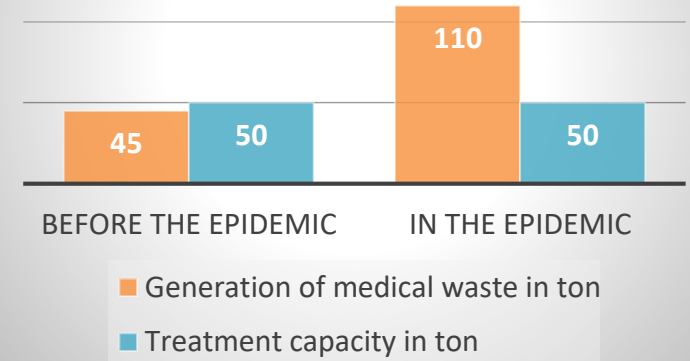
- Lack of the transportation vehicle
- Insufficient treatment capability



**Mountains of medical waste are not be picked up, posing great risks to the public.**



Medical Waste in Epicenter - Wuhan



# Where Does the Surge of Medical Waste Come from?

## Infectious waste defined by WHO:

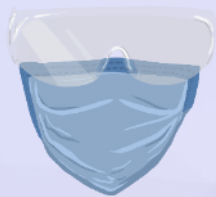
1. Waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples)
2. Cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories)



**This leads to a sharp increase in medical waste**

## 3. Waste from patients with infections

Masks and goggles



Protective suits and gloves



General waste from quarantine hospital



- Contagious material, such as used protective suits, masks, gloves, goggles, etc.
- All general wastes from quarantine wards shall managed as medical wastes



# Measures Taken by China Ministry of Ecology and Environment (MEE) Against Novel Coronavirus



## Building Emergency Plant in 15 days

China MEE and Wuhan government decided immediately to build an emergency 30 ton/days medical waste plant within **15 days**. This project is lead by **China Energy Conservation and Environmental Protection (CECEP)** and **Gient** provided the technical solution and a full set of equipment.

14 days ago



14 days after



## Mobilizing All The Mobile Stations in China

China MEE has mobilized all the mobile medical waste treatment stations to support Wuhan.



China MEE is intending to:

1. **DOUBLE** the capacity of centralized plants.
2. Build the proper centralized plant in **EVERY** city **BEFORE 2021**.
3. Equip each province with a certain number of mobile stations

# Who are We?



is a global supplier of medical waste treatment system

- Established in 1995.
- The largest and most professional supplier of medical waste treatment system in China.
- High standard, **ASME** and **CE** certification, and exported to Europe and US.
- Own dozens of core patents and proprietary technologies.
- Over 200 units are running in over 20 countries on five continents.
- Over 150 centralized plants in operation.
- Pass the Efficacy Test by European and USA third party testing, approved by Europe and USA authorities.
- Provide turkey projects, support & service.



# What Has Gient Done against the Epidemic?



1

Built an emergency medical waste treatment plant and put into Service for Epicenter Wuhan within 14 Days (capacity: 30ton/day)



2

Provided a batch of onsite medical waste treatment equipment to Wuhan hospitals



3

Provided Mobile Medical Waste System Stations to epidemic area Hubei Province



Another permanent plant with 60 ton/day shall be completed and put into service from 23. April 2020.

**——We Built the Last Defense in Epidemic.**

# Gient Technology Comparing to Incineration



Pic: Medical waste treatment autoclaving plant in city Changsha (near Wuhan) during epidemic, reported by local media.



Pic: A worker burns infectious medical waste onsite at Leishenshan Hospital of Wuhan. Source: Globaltimes



Pic: A rotary kiln treats medical waste in Wuhan. Source: Globaltimes



## Gient medical waste autoclave

- Clean
- Safe
- Efficient
- Environmentally friendly



## Incineration: incinerator and rotary kiln

- Great pollutions
- High failure rate due to the high calorific value in medical plastic
- Health damage to the workers and public by harmful substances

Incineration of medical waste is the main source of **dioxin**. ---- UNEP & WHO

# Gient Technology Comparing to Microwave

## Prior Shredding Microwave:

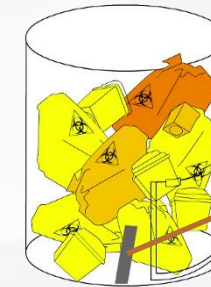
- Shredder is outside the sterilization chamber and is not sterilized. It brings infection risk to repair once the shredder fails to grind the waste.



Prior Shredding

## Mixing Shredding Microwave:

- Mixed shredder is not suitable for large quantity of textiles. When it fails to shred the waste, it causes insufficient sterilization.



Mix Shredder

According to the experience in Wuhan, a large quantity of **protective suits, textiles,** and even **sheets** exist in coronavirus medical waste, which resulting lots of shredding problems in microwaves.



## Gient medical waste autoclave:

- Equipment can work **with or without** a shredding process and complete the sterilization without any failure.





# Advantages of Autoclave in General

Economic  
Investment  
and Operation

Reliable  
Operation

Efficient  
Process

Environment  
Friendly

Autoclave is mature and main stream non-incineration technology adopted by USA and China.



United States

**Since 1990:** 90% of the new facilities permitted commercial medical waste facilities use autoclave;

**Nowadays** in US, 70% of medical waste treatment facilities use autoclave.

**After 2006:** 150 centralized incinerators are still running. But on-site incinerators had been banned;

**Nowadays** 95% of the new facilities are using autoclave.



China

**Before 2006:** 200 centralized incinerators and 700 on-site incinerators operated;

**After 2006:** 150 centralized incinerators are still running. But on-site incinerators had been banned;

**Nowadays** 95% of the new facilities are using autoclave.

A faint, light gray world map is centered in the background of the slide, showing the continents of North America, South America, Europe, and Asia.

# Gient Solutions for Medical Waste Treatment

## Under Novel Coronavirus (COVID-19)



# **Proposal to** Centralized Medical Waste Treatment Plant

— Solving the major problem and taking the main responsibility of  
medical waste treatment

# A Typical Plant of Centralized Medical Waste Treatment



1. Autoclave
2. Boiler
3. Shredder
4. Waste water treatment and recycling system
5. Waste gas collection and deodorization system
6. Cold storage
7. Container
8. Container washer



# Centralized medical waste treatment – Autoclave

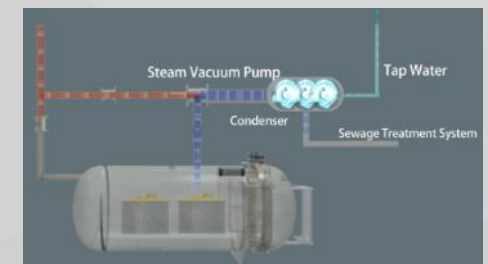
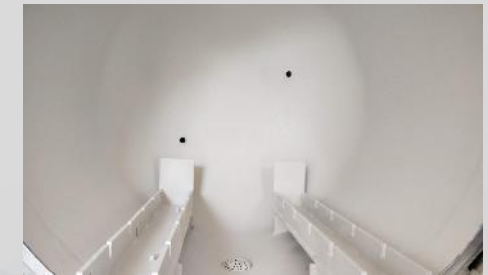


MWC Series

**Application** Off-site treatment in centralized plants  
**Disposal Capacity** of a single autoclave is up to 20 ton per day (16 working hours)

## Features

- **Lower average operation cost per kilogram** – Large capacity and high productivity
- **Anti-corrosion Perfection of in-wall** - Special anti-corrosion coating to avoid corrosion of medical waste to the inner wall
- **Better working ambient** - Efficient and Effective steam control during whole process



# Centralized medical waste treatment – Whole Packaged Solution



**Shredder System**

Dedicated developed for various material of medical waste



**Boiler or Steam Generator**

Interval steam supply to coordinate with autoclave



**Waste Water Treatment and Recycling System**

Dedicated developed for medical waste plants;  
>90% waste water recycling



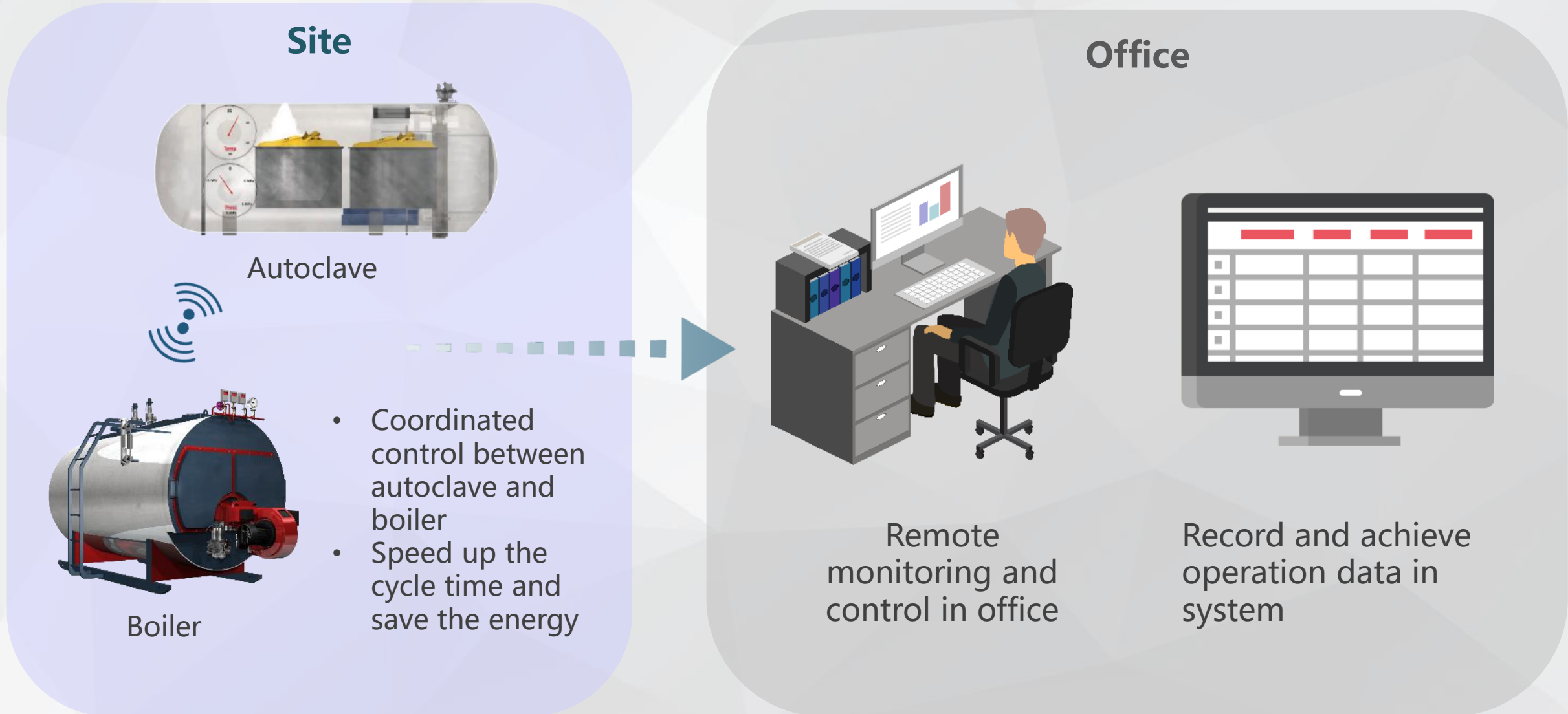
**Automated Container Tunnel Washer**

Compliance with US Standard;  
Use 50°C disinfectant and 82°C hot water clean medical waste container effectively and efficiently

# Centralized medical waste treatment



– Gient Centralized Intelligent Control System (A Distributed Control System)



## **Proposal to**

## Medical Waste Treatment in Hospital

— Processing high contagious medical wastes and minimizing risks during transportation



# Onsite medical waste treatment – Integrated Autoclave with Shredder



MWI Series

**Application** Hospital with >300 beds

**Disposal Capacity** from 150L - 2500L per cycle

## Features

- **Only one operator is required** – fully automated process
- **80% waste volume reduction** - Double-shaft built-in shredder
- **Anti-corrosion perfection of in-wall**  
- by clean the in-wall in every cycle
- **Better working ambient** – combined odor control processes



# Onsite medical waste treatment – Vertical Autoclave



MWV Series

**Application** small hospitals or clinics

**Disposal Capacity** 100L per cycle

## Feature

- **Economic** – for low budget of medical waste treatment
- **Easy to install and to connect to infrastructure** – Compact design
- **Anti-corrosion perfection of in-wall** – by clean the in-wall in every cycle
- **Better working ambient** – by combined odor control processes

# Proposal to Emergency Medical Waste Treatment

— Providing timely treatment to areas with insufficient capacity  
in an epidemic outbreak

# Emergency Medical Waste Treatment – Mobile Station



MWM Series

**Application** Serving in emergencies such as natural disasters, epidemic disease ( MERS), field hospitals, etc.

**Disposal Capacity** 150L, 750L and 1500L per cycle

## Features

- **All-weather working (24H/7D)**
- **Easy to operate and adopt to various environment** – including autoclave, shredder, (power generator), lighting system and wing-open container.



# Our Certificates & Approvals



## ISO 9001



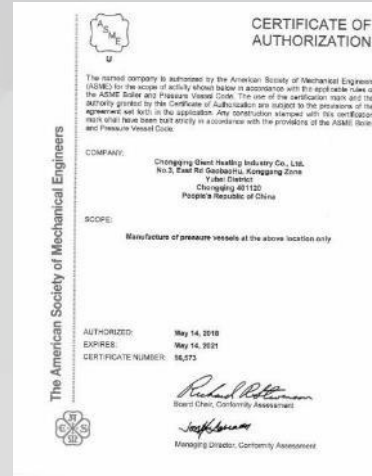
National High-tech Enterprise

## ISO 14001



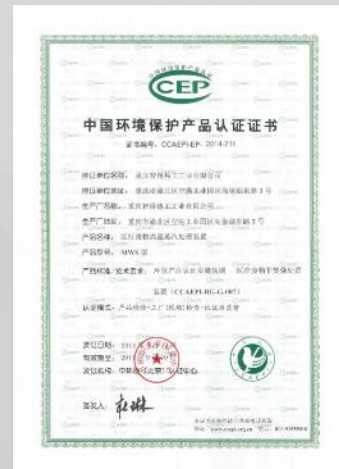
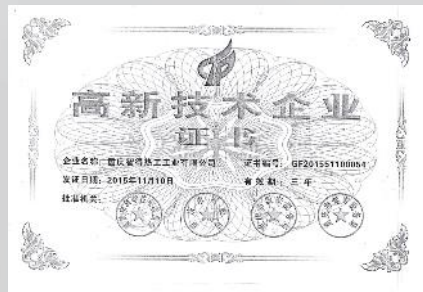
Certification for Environmental Products

## ASME



Manufacturer License of Special Equipment in China Pressure vessel

## CE



# Sterilization Efficacy Report

Tested by qualified international standard laboratories:

**Chongqing Centers for Disease Control and Prevention (CDC)**  
Report of Test Results

VIKX[2015] No.795 Page 1 of 1

Name of sample: Tablets for monitoring 2 units of MW12500 system for disposing medical wastes by high temp. & press. steam

Sample status and package: white paper

Quantity of samples: 20 tabs.

Sampled organization: Chongqing Gient Heating Industry Co., Ltd.

Delivering organization: Chongqing Gient Heating Industry Co., Ltd.

Date of reception: Dec. 17, 2015

Date of inspection: Dec. 17, 2015

Test item: Sterilization Efficacy for MW12500 System

Test standard: Ministry of Health Technical Standard for Deinfection (2002 Edition) 3.17.2.1

Test results:  
The tablet with bacteria (B.t. stearothermophilus spores ATCC7953  $5.0 \times 10^6 \sim 5.0 \times 10^7$  cfu/tab, produced by the Beijing Sihan Disinfection Co.Ltd), delivered by the said organization for monitoring 2 units of MW12500 system (unit A & B) for disposing medical waste by high temperature and pressure steam. Each unit with continuing 5 cycles, 2 pieces per cycle, and total sample quantity is 20 pieces. The samples has been inoculated with bromocresol purple glucose peptone water matrix and found free of bacteria growth after being cultured or > 8 log reduction of bacterial spores.

Tested by: [Signature] Reviewed by: [Signature] Issued by: [Signature]

AAI: Changqing Rd No.8, Yusheng Dist., Chongqing, China 400042 Tel: 86 (023) 48812156

**广东省微生物分析检测中心**  
ANALYSIS REPORT

样品名称: MWS 型医疗废物高温蒸汽处理器

样品规格及批号: MWS800

Spec. and Lot No. of Sample: MWS800

委托单位: 中国环境报社产业协会

检测项目: 灭菌效果

报告编号: 2014SP0810D

检测日期: 2014/04/03

检测日期: 2014/04/03 to 2014/04/05

报告日期: 2014/04/10

检测方法: GB 15981-1995

**分析检测结果**  
Results

试验菌株 Type of test germ: 嗜热脂肪芽孢杆菌 (Bacillus stearothermophilus) ATCC7953	试验包 1		试验包 2		试验包 3	
	Test Bag No.1	Test Bag No.2	Test Bag No.1	Test Bag No.2	Test Bag No.1	Test Bag No.2
灭菌周期 Sterilization Cycle No.	灭菌片 1 Spore tablet No.1	灭菌片 2 Spore tablet No.2	灭菌片 1 Spore tablet No.1	灭菌片 2 Spore tablet No.2	灭菌片 1 Spore tablet No.1	灭菌片 2 Spore tablet No.2
灭菌周期 1 Cycle No.1	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple
灭菌周期 2 Cycle No.2	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple	紫色 Purple

结论: 灭菌合格  
Conclusion: Test result show sterilization efficacy is qualified.

(以下空白, Blank below)

备注: 1) 紫色表示阴性,黄色表示阳性, Purple color indicating negative result, yellow color indicating positive result.  
2) 灭菌过程由产气完成, Sterilization process is completed by the inflation.  
3) 生产厂家: 重庆管理技术有限公司 Chongqing Gient Heating Industry Co., Ltd.

制表: [Signature] 审核: [Signature] 批准: [Signature]

Editor: [Signature] Verifier: [Signature] Approver: [Signature]

**Microbiological Efficacy Validation Report of the Gient Autoclave Model MWS 400**

Environmental Solutions of America  
6705 Pickard Drive  
Syracuse, New York  
13211

October 2017

Submitted by:  
WNWN International  
PO Box 1164  
Burlington, Connecticut  
06013

**EUROLAB**  
Εργαστήριο Ελέγχου Τροφίμων

Θεσσαλονίκη, 5-9-2017  
Αριθ. Πρωτ.: 145-9-17

**ΔΙΑΒΑΣΗ ΣΥΜΜΟΡΦΩΣΗΣ**

Με την παρούσα επιστολή βεβαιώνεται ότι κινείται έλεγχος του τριτογενούς μετ' επιβεβαιωμένης της αποτελεσματικότητας, κατά το αρθρο έλεγχου ΕΛΟΤ ΕΝ ISO 11138.01, διαπιστώθηκε ότι το Σύστημα Αποστείρωσης: Επικενδώνων Ιατρικών Αποβλήτων Μολυσματικού Χαρακτήρα MW12500 GIENT του «Κέντρου Περιεργασίας Μολυσματικών Αποβλήτων» στο 11<sup>ο</sup> Οικοδομικό Τετράγωνο της Β.Π.Π. Σέρρων της εταιρείας «ΟΙΚΟΛΟΓΙΚΗ ΑΝΑΚΥΚΛΩΣΗ ΚΑΙ ΔΙΑΧΕΙΡΣΗ ΑΠΟΒΛΗΤΩΝ Δ.Ε.» συμμορφώνεται στο πρότυπο του ΕΛΟΤ αρ. 12740.09, όπως αυτό δηλώνεται από τη: αρθ. 4.3 του Παραρτήματος 1 της ΚΥΑ146163/12 (ΦΕΚ15378/8-5-12).

Για τη Eurolab

Ο Διορθωτής  
[Signature]

Η Υπεύθυνη Ποσότητας  
[Signature]

Αρ. Ιωάννης Πατάσης  
Κτηνίατρος

Δρ. Ευαγόρα Περίπου  
Κτηνίατρος-Μικροβιολόγος

Submitted by:  
WNWN International  
PO Box 1164  
Burlington, Connecticut  
06013

✓ Chongqing Centers for Disease Control and Prevention

✓ Guangzhou Detection Center of Microbiology

✓ WNWN International (USA)

✓ EUROLAB (Greece)



# Some Typical Installation Cases

# Changsha Medical Waste Treatment Center Asian – 40 ton/day

The Asia's largest medical waste treatment center until now





## Yangzhou Medical Waste Treatment Center – 15 ton/day

The FIRST demonstration of medical waste autoclaving treatment plant in China



## Foshan Medical Waste Treatment Center – 20 ton/day

China's first medical waste treatment plant invested by a top 500 enterprise **VEOLIA**



Lanzhou Medical Waste Treatment Center –10 ton/day

A fully automated medical waste treatment plant equipped with  
**AUTO-TRANSFER LINE**



# Bazhou Medical Waste Treatment Center – 10 ton/day



All facilities are supplied by GIEN



Medical Waste Treatment Plant in Syracuse NY, USA – 5 ton/day  
GIENT's autoclaves are compliance with worldwide highest Environmental Standards



# Medical Waste Treatment Plant Thessaloniki, Greece – 10 ton/day

Two units of MWI-2500 were set up in Thessaloniki since 2016



# On-site Medical Waste Treatment in Bangkok, Thailand – 500kg/day

A unit of MWI-300 was set up in Bangkok since March of 2017



# On-site Medical Waste Treatment in Philippines

GIENT has various on-site equipment running in Philippines



Smart Station  
MWS-700×1



Integrated Autoclave  
with Shredder  
MWI-150



Vertical Autoclave  
MWV-100T

# On-site Medical Waste Treatment in Peru- 250kg/day

A unit MWI-150 was installed for an Peruvian hospital since 2019

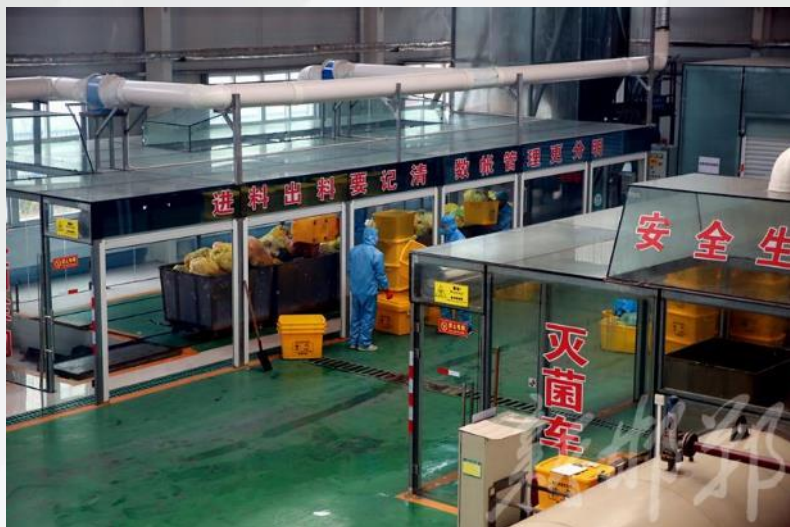




# More Cases



# Cases under Novel Coronavirus in China



A faint, light gray world map is centered in the background of the slide. The map shows the continents of North America, South America, Europe, Africa, Asia, and Australia. The background of the entire slide is a light gray geometric pattern of overlapping triangles.

# Gient

We Build The Last Defense in The Epidemic



YMGI Medical Supply  
601 Arrow Lane, O'Fallon MO 63366, USA  
phone: 636-272-6800  
web: [ymgimedicalsupply.com](http://ymgimedicalsupply.com)  
email: [info@ymgimedicalsupply.com](mailto:info@ymgimedicalsupply.com)