

Integrated Medical Waste Autoclave with Shredder Model MWI-300

Date: 7th. Jul. 2021



(The pictures are for reference, please subject to the final products)

PREPARED FOR

Corneliu Bunic

Ericon SRL

PROVIDED BY

Manyu Li

From Gient Heating Industry Co,. Ltd



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1. Company Brief

Gient was established in 1995, as the national high-tech enterprise, Gient specializes in design, engineering, and manufacturing sterilization medical waste treatment systems.

Gient has owned dozens of global leading patented and proprietary technologies and uses a patented, automated, proven infectious waste treatment process which achieves highest efficacy and respects the strictest environmental standards worldwide. As China's leading supplier of medical waste treatment system, Gient has successfully built up more than hundreds of units of medical waste autoclave systems over 20 countries on five continents. Gient's medical waste treatment products including: centralized medical waste treatment system, integrated autoclave with shredder and mobile unit, which can meet various demands of the medical waste disposal.

Gient has been approved following certification systems including but not limited:

ASME (The American Society of Mechanical Engineers),

CE (European Directives),

ISO9001 /ISO14001/ISO45001,

CNAS (China National Accreditation Service for Conformity Assessment),

SGS (Societe Generale de Surveillance S.A)













2. Technical Specification

2.1 Proposal brief

- 2.1.1 This is an integrated medical waste treatment solution applied in hospital.
- 2.1.2 Integrated Autoclave with Shredder (MWI series) is designed for treatment of infectious waste, sharps and pathological waste or regulated waste as per local authority.
- 2.1.3 The daily working time in this proposal is calculated at one shift (8h), however, more shifts are allowed.
- 2.1.4 The average medical waste density in this proposal is calculated at 100 kg/m³. Please note the actual density should be according to local conditions.
- 2.1.5 Processing capacity: one unit of MWI-300 can dispose 30kg/cycle and based on 30min cycle time, and disposes 60kg/h.

2.2 Operating principle

In medical waste treatment, the waste is loaded through the top door into the autoclave; the waste is then shredded and fall to the sterilizing chamber of the autoclave; saturated steam (121°C-138°C) is then injected to sterilize the waste and whole autoclave; after the water cooling and evacuation (-0.06MPa) processes, the final shredded and sterile waste achieves a microbial inactivation 8Log10 (99.999999%) and disposed as municipal waste. All the processes are automatic and closed in one vessel.

2.2.1 Operation process chart



1.Loading 2.Shredding 3.Sterilization 4.Cooling 5.Vacuum 6.Unloading

2.2.2 Process description

Loading: medical waste is loaded into loading chamber by an automatic dumper through the top door.

Shredding: The shredder rotates forwards and backwards to shred the waste into unrecognizable pieces which then fall into the sterilizing chamber.

Sterilizing: in the sterilization process, the saturated steam is injected into the chamber to heat the



waste to destroy all forms of microbial germs.

Cooling and drainage: the cold water is sprayed into the chamber to decrease the temperature and then be drained out.

Post-vacuum: post-vacuum process is to remove the residual vapor and moisture to reduce the odor, and the treated waste is cooled and dry at end of the cycle.

Unloading: the bottom door open, and the sterile waste is unloaded.

Please see video https://www.youtube.com/watch?v=4p64BPfL1gA&t=18s for more detail.

2.3 Technical specification & main parameter for one unit of MWI-300

MWI Series	Unit	MWI-300		
General Parameters				
Dimension (L×W×H)	mm	3800×2700×5100*		
Chamber Material	-	Stainless Steel		
Net Weight	ton	3.5		
Rated Power	kW	11		
Loading	-	Vertical loading, by automatic dumper		
Disposal Volume	liter/cycle	300		
Waste Density*	kg/m³	100		
Disposal Weight	kg/cycle	60		
Cycle Time	min	30		
Working Temperature	°C	121-138		
Working Pressure	MPa	-0.06-0.25		
Design Temperature	°C	152		
Design Pressure	MPa	-0.1-0.4		
Microbial Inactivation	-	8 Log10 (99.999999%)		
Volume Reduction	%	80		

^{*}Dimension may be modified according to local circumstance, please subject to the final product.

^{*}Please note the actual waste density is according to local conditions.



3. System Composition

The integrated autoclave with shredder system is mainly composed of autoclave with built-in shredder unit, hydraulic ring vacuum pump, control system, valves and instruments, and material handling system including loading and unloading containers, automated dumper, platform and steam generator etc.

3.1 Autoclave

High temperature, high pressure, and high vacuum autoclave sterilization system with built-in shredder, computerized by control plus PLC for centralized medical waste treatment.

3.1.1 Standard

The autoclave is manufactured and tested in accordance to GB and certified by CE 2014/68/EU.

3.1.2 Autoclave material

Autoclave chamber material is stainless steel.

3.1.3 Autoclave door system

Automatic & quick opening door with mechanical interlock devices; PLC interlock controlled with double safety design assure that no steam going into autoclave when door is unlocked and no door opening while under pressure. Autoclave door ring is sealed by inflatable sealing ring.

3.2 Built-in shredder

To match with the autoclave system, medical waste shredders are designed to render waste into unrecognizable short pieces. The shredder feathers of:

- WIPO patent of special disassembling structure of the shredder.
- Double-shaft shredder with special wear-resistant blades, strong and durable.
- The shredder identifies waste jamming and change rotating direction alternatively to crush the waste thoroughly.
- Low speed torsion, crush all kinds of medical waste.
- Controlled by PLC, automated recognize forwarding & reversing, overload protection etc.





Fig.: Shredder Blades & Shafts

3.3 Vacuum pump

High efficiency hydraulic ring vacuum is capable to evacuating air to negative pressure in a short time.

3.4 Control system

Microprocessor control system for autoclaves including safety instrument to monitor and control the autoclave operation. Powerful features including but not limited:

- Siemens HMI color touch screen 10" or similar brand.
- All electrical components are provided by world famous brand such as Siemens.
- Visible live treatment process, real-time temperature and pressure.
- Updatable and super-micro programmable logic controller (PLC).
- Automatically recording/data memory.
- Micro-printer to print operation data every cycle.
- Safety interlocks for door operation.
- Failure alarm and emergency stop.
- Auto/manual switch mode available.
- Multiple languages available.



Fig. Colorful Touch Screen with Live Process



3.5 Material handling system

3.5.1 Dumper

The heavy-duty dumper can be customized and matched to work with the containers, which works to lift the container and dump the waste into the autoclave loading chamber.

3.5.2 Loading container

The containers are for transportation and loading the waste. Volume: 240L.

3.5.3 Unloading system

Gient provides either unloading cart/container or automated unloading system according to site circumstance.

3.5.4 Maintenance platform including ladder etc.

The maintenance platform including ladder etc. is to help operator to inspect the machines at a time of repair or maintenance etc.

3.6 Steam generator

Gient supplies steam generator to each autoclave system, which is special suitable for medical waste treatment and match the operation of MWI-300.

3.6.1 Standard

The boiler is manufactured and tested in accordance to GB and certified by CE 2014/68/EU.

3.6.2 Technical specifications of boiler

Boiler system includes a water supply pump, water softener, and control cabinet etc.

Steam generator	Unit	WDR0.1-0.7
Dimension (L×W×H)	mm	1400×1000×1100
Net Weight	kg	400
Rated Evaporation	kg	110
Rated Power	kW	90
Fuel Type	-	Electricity

^{*}Specification for reference, please subject to final confirmation.

3.6.3 Features of Steam Generator

- Fast and large quantity steam supply special designed for medical waste treatment.
- With a larger water volume
- Stable high quality steam supply & energy saving design



4. Basic Operation Requirement

Infrastructure				
	Name	Unit	Value	Remark
1	Water source	МРа	0.3	Client shall prepare the qualified booster pump if the water pressure does not meet the requirement on site.
2	Steam source	MPa	0.7	Client can choose Gient boiler to provide steam source.
3	Compressed air source	МРа	0.8	Client shall prepare the qualified air compressor if the compressed air does not meet the requirement on site.
4	Power supply	kW	105	Power specification will be in accordance with local power supply. The local power supply shall be stable.
5	Sewage system	-	-	Sewage/waste gas will enter to user's sewage/exhaust gas treatment system, the
6	Waste gas	-	-	corresponding treatment systems is determined by the local laws and regulations.
Bu	ilding Requirements			
1	Operation dimension	mm		L×W×H
2	The minimum size of the plant	m		L×W×H
3	Floor strength	-	-	Weight of the equipment
	ilding requirements an given after local requir	•	· ·	gs will be according to local requirements and

4.2 Operation Cost Data of Medical Waste Treatment System

4.2.1. Equipment power consumption (total power consumption is 39kWh/h)

No.	Item	Rated	Electricity	Electricity
		power kW	consumption/cycle	consumption/hour
			kWh	kWh
1	Steam generator	90	17	34
2	Integrated Autoclave with Shredder	11	1.5	3
3	Air compressor	3	1	2



4.2.2 System water consumption (total approx. 0.18m³/h)

No.	Item	Water consumption	Water consumption	
		kg/cycle	kg/cycle	
1	Steam generator	20	40	
2	Integrated Autoclave with	70	140	
	Shredder			

Note: The data is for reference, please subject to final operation cost



5. Gient Technologies and Advantages

We are proud to provide Gient medical waste treatment system with unique features and advantages as follows:

INNOVATION

- Wide ranges of product series cater to various demands.
- Advanced technologies applied in design, manufacturing, and service.
- Patented technologies for easy and quick replacement of blades.
- Customer oriented design and service.
- One-stop supply provide to customers full package proposal.

EASY AND SAFE

- Fully automated operation process.
- Computerized system plus PLC.
- Touch screen enables every process visible.
- Operators no contact with infectious waste in whole process.
- Secured by multiple safety mechanism (including hydraulic, mechanical, and electrical protection).

CLEAN AND EFFECTIVE

- Green process without emission of harmful substance (VOCs such as dioxin, furan etc.).
- Clean process reducing 90% nuisance odors on-site.
- Respect strict environmental standard worldwide.
- Microbial inactivation efficacy test exceeds 8 Log10 (99.999999%).
- Final product is rendered unrecognizable same as household waste.

ECONOMICAL AND RELIABLE

- Proven lowest operation cost.
- Water recycling option available.
- Low maintenance cost budget.
- Spare parts available at low budget for lifetime.



6. Budgetary

6.1 Price

Description	Model	Unit Price (USD)	Qty.	Total Price (USD)
1. Medical waste treatment systemIntegrated autoclave with shredderVacuum pump				
 PLC control cabinet with touch screen Pneumatic control system Automated dumper Supporting platform Customized unloading system Valves and instruments 	MWI-300	90,000	1	110,000
2. Steam generatorSteam generator bodyValves and instrumentsWater softener	WDR1.0-0.7	12,000	1	
3. Onsite installation guidance,debugging, and training7 days' installation guidance, debugging,and on-site training.	-	8,000		

6.2 Remarks

1) PRICE: FOB Chongqing, China

2) PAYMENT TERM: 30% down payment and 70% balance before shipment.

3) LEAD TIME: 90 days after receive down payment.

4) PACKAGE: Seaworthy package.

5) VALIDITY: 30 days.

6) WARRANTY: 24 months against Bill Lading date.

6.3 Warranty

Gient warrants that the product supplied when operated and maintained by competent personnel and in accordance with the instructions, and provided that the client has made no alterations to the system, then Gient shall guarantee quality 24 months against B/L date. Gient will correct or replace defective component or part, provided client gives the written notice during said warrant period. Exception is taken for normal wear, tear or abuse and consumables.



6.4 After-sales Service

6.4.1 Onsite Service

Gient engineers shall be responsible of on-site installation, debugging, start-up and training, it can be referred as above 6.1.3. The Buyer shall provide Gient engineers business-like accommodation during the stay and provide engineer round-trip ticket (economy class). When the on-site service time is more than above mentioned days, the Buyer shall pay then engineer's labor cost (labor cost at \$350/ person/day). In case the excess time is less than one day, it shall also be calculated as one day.

6.4.2 Online Service

When the project is accepted and transferred to client, Gient will provide lifespan free online service (phone/email, etc.) of answering any questions or query during facility operation and maintenance, guidance to resolve equipment failures etc. The response time is within 12 hours.



7. Certificates and Approvals

ASME

(A_{S_{ME}}

CERTIFICATE OF AUTHORIZATION

The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with the ASME Single Certification Mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

Chongqing Gient Heating Industry Co., Ltd.
No.3, East Rd GaobaoHu, Konggang Zone
Yubei District
Chongqing 401120
People's Republic of China

SCOPE:

Manufacture of pressure vessels at the above location only

AUTHORIZED: May 14, 2021 EXPIRES: May 14, 2024

CERTIFICATE NUMBER: 56573

Board Chair, Conformity Assessment

Ridel B. Capell

Managing Director, Conformity Assessment







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COMPANY:

Chongqing Gient Heating Industry Co., Ltd.
No.3, East Rd GaobaoHu, Konggang Zone
Yubei District
Chongqing 401120
People's Republic of China

SCOPE:

Manufacture and assembly of power boilers at the above location only

AUTHORIZED: May 14, 2021 EXPIRES: May 14, 2024

CERTIFICATE NUMBER: 56572

Board Chair, Conformity Assessment

Ride B. Cyll

Managing Director, Conformity Assessment









CERTIFICATE OF QUALITY MANAGEMENT SYSTEM CERTIFICATION

Certificate No.016CQ21Q30596R7M Unified social credit code:91500112202914572F

This is to Certify that the Quality Management System of

CHONGQING GIENT HEATING INDUSTRY CO., LTD.

is in conformity with GB/T19001-2016 idt ISO9001:2015 Standard, applies to

DESIGN AND MANUFACTURE OF DI CLASS PRESSURE VESSELS; MANUFACTURE OF GRADE B

REGISTERED ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C. OPERATION ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C.

Date of Initial Issuance: Jan. 11, 2001 Date of Re-certification Issuance:Mar. 23, 2021 Date of Expiration: Jul. 9, 2024 BCC Inc. President:





BCC Address: Room 1101, Floor 11, Building 1, Guayingyuan, Xicheng District, Beijing, P.R.C. This certificate is valid within state - specified validities of administrative and qualification licensing. The effectiveness of this certificate shall be maintained by regular surveillance audit, the validity of the certificate can be inquired through www.bcc.com.cn or by QR code. The information of this certificate available for inquiry on CNCA's website: www.cnca.gov.cn.











CERTIFICATE OF ENVIRONMENT MANAGEMENT SYSTEM CERTIFICATION

Certificate No.016CQ21E30406R2M Unified social credit code:91500112202914572F

This is to Certify that the Environment Management System of

CHONGQING GIENT HEATING INDUSTRY CO., LTD.

is in conformity with GB/T24001-2016 idt ISO14001:2015 Standard, applies to

DESIGN AND MANUFACTURE OF DI CLASS PRESSURE VESSELS; MANUFACTURE OF GRADE B BOILERS

REGISTERED ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C. OPERATION ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C.

Date of Initial Issuance: Apr. 8, 2015

Date of Re-certification Issuance: Mar. 23, 2021

Date of Expiration: Apr. 7, 2024

BCC Inc. President:





BCC Address: Room 1101, Floor 11, Building 1, Guoyingyuan, Xicheng District, Beijing, P.R.C. This certificate is valid within state – specified validates of administrative and qualification licensing. The effectiveness of this certificate shall be maintained by regular surveillance suddi, the validity of the certificate can be insquired through swww.bcc.com.co. or by QR code. The information of this certificate available for inquiry in CNCA's website: www.nca.gov.cn.











CERTIFICATE OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATION

Certificate No.016CQ21S30579R2M Unified social credit code:91500112202914572F

This is to Certify that the Occupational Health and Safety Management System of

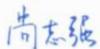
CHONGQING GIENT HEATING INDUSTRY CO., LTD.

is in conformity with GB/T 45001-2020 idt ISO 45001:2018 Standard, applies to

DESIGN AND MANUFACTURE OF D1 CLASS PRESSURE VESSELS; MANUFACTURE OF GRADE B BOILERS

REGISTERED ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C. OPERATION ADDRESS:NO.3, GAOBAOHU EAST RD., KONGGANG INDUSTRIAL ZONE, CHONGQING, P.R.C.

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Sterilization Efficiency Test Report of MWI-2500 by Eurolab



Θεσσαλονίκη, 5-9-2017 Αριθμ.Πρωτ.: 14/5-9-17

ΑΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ

Με την παρούσα επιστολή βεβαιώνεται ότι κατόπιν ελέγχου του εργαστηρίου μας περί της αποτελεσματικότητας της αποστείρωσης, κατά το πρότυπο ελέγχου ΕΛΟΤ ΕΝ ISO 11138.01, διαπιστώθηκε ότι το Σύστημα Αποστείρωσης Επικινδύνων Ιατρικών Αποβλήτων Μολυσματικού Χαρακτήρα ΜWI2500- GIENT του «Κέντρου Επεξεργασίας Μολυσματικών Αποβλήτων» στο 11° Οικοδομικό Τετράγωνο της ΒΙ.ΠΕ. Σερρών της εταιρείας «ΟΙΚΟΛΟΓΙΚΗ ΑΝΑΚΥΚΛΩΣΗ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗ ΑΠΟΒΛΗΤΩΝ Α.Ε.» συμμορφώνεται στο πρότυπο του ΕΛΟΤ αρ. 12740/00, όπως αυτό ισχύει, βάσει της παρ. 4.3 του Παραρτήματος Ι της ΚΥΑ146163/12 (ΦΕΚ1537Β/8-5-12).

Για τη Eurolab

Ο Διευθυντής

Δρ. Ιωάννης Παπάτσας Κτηνίατρος Η Υπεύθυνη Ποιότητας

Δρ. Ευανθία Πετρίδου Κτηνίατρος-Μικροβιολόγος

1 από 2



Sterilization Efficiency Test Report of MWI-2500 by CNAS



YJKXZ[2015] No.795

Page 1 of 1

Name of sample: Tablets for monitoring 2 units of Trademark: ----

MWI2500 system for disposing medical wastes by

high temp. & press. steam

Manufactured by: ----

Sample source: delivered for test

Sampled organization: ----Quantity of samples: 20 tabs.

Sampling organization: ----Sampled by: ----

Delivering organization: Chongqing Gient Heating Delivered by: Yang Chao

Industry Co., Ltd.

Sample status and package: white paper

Date of reception: Dec. 17, 2015

Date of manufacture/batch No.: ----

Date of inspection: Dec. 17, 2015

Test item:

Sterilization Efficacy for MWI2500 System

Test standard:

Ministry of Health, Technical Standard for Disinfection (2002)

Edition) 3.17.2.1

Test results:

The tablet with bacteria (B.stearothermophilus spores 5.0*105~5.0*106 cfu/tab, produced by the Beijing Sihuan Disinfection Co.Ltd), delivered by the said organization for monitoring 2 units of MWI2500 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 bromcresol purple glucose peptone water matrix and found free of bacteria growth after being cultured.

Tested by: (signature)

Reviewed by

(signature)

Dec. 25, 2015

Add: Changjiang Rd No.8, Yuzhong Dis., Chongqing, China 400042

Tel: 86 (023) 68812536



Gient Heating Industry Co., Ltd.

No.3 Gaobaohu East Road, Konggang zone, Yubei district, Chongqing 401120, China

Web: www.gient.net

Phone: +86 23 67383009

Email: info@gient.cn