

Aruna Sharma, IAS, Secretary, MeitY (Govt. of India) confirming "Microwave is 50% cheaper than Autoclave (5 Years)"



डॉ अरुणा शर्मा, आई.ए.एस.
सचिव
Dr. Aruna Sharma, I.A.S.
Secretary



भारत सरकार
संचार और सूचना प्रौद्योगिकी मंत्रालय
इलेक्ट्रॉनिक्स और प्रौद्योगिकी विभाग
Government of India
Ministry of Communications &
Information Technology
Department of Electronics &
Information Technology (DeitY)

Dear Sir,

An indigenous technology of societal importance, Microwave Disinfection System for hospital waste disposal has been developed by Society for Applied Microwave Electronics Engineering and Research (SAMEER), a scientific society of Department of Electronics and Information Technology (Deity). This patented technology has been transferred for commercialization.

2. Amongst the various methods recommended for the disposal of infectious waste, i.e., incineration, autoclaving, microwave, deep burial, etc., microwave offers many advantages. Microwave energy penetrates and heats the entire material at nearly the same rate and converts the infectious waste into municipal waste which can be handled by human beings and disposed of alongwith other municipal waste.

3. The system developed has been validated for its efficacy at Haffkine Institute, Mumbai, a leading microbiological test laboratory in the country. The indigenous microwave system is environment friendly, clean and very handy. It can be installed right at the place (outside the operation theater or patients ward) where waste is being generated so that infection is stopped or limited at the source itself, thereby eliminating its spread to a great extent during transportation. A statement showing cost comparison of Autoclave versus Microwave, over a period of five years, as worked out by TOT partner, is enclosed for your kind reference. Though the initial cost of Microwave Disinfection System is higher, in the longer run taking into account opex it is 55% cheaper than Autoclave System.

4. This indigenously developed technology appropriately fits in the Government's initiatives of "Make in India" and "Swachh Bharat Abhiyan". This can be deployed at all public health centres / hospitals where infectious waste is generated.

5. I would request for your co-operation in promoting this indigenous technology for deployment in hospitals by mandating appropriate policy prescription.

With regards,

Encl: As above

Yours Sincerely,

(Dr. Aruna Sharma)

Shri Bhanu Pratap Sharma
Secretary
Department of Health & Family Welfare
Ministry of Health & Family Welfare
"A" Wing, Nirman Bhavan
New Delhi-110 011

AUTOCLAVE Vs MICROWAVE



Techno-Commercial Comparison

Sr. No.	Parameters	Microwave (Optimaser™)	Autoclave	Remarks
1.	Disinfection Cycle Duration	20 - 45 Mins	90 -120 mins	50% less Cycle Duration
2.	Level of Disinfectant	High 10^8 - 10^{10}	Low 10^3 - 10^5	Microwave - Best in class disinfectant in 50% less time cycle.
3.	Power Consumption	1.5 Kw/hr	10 Kw/hr	Microwave- 85% less power consumption with zero additional equipment support like secondary boilers, stabilizers etc.
4.	Post Installation Electromechanical maintenance	Rs.2000/month	Rs.4000/month	Microwave- maintenance 50% less cost
5.	Consumables required / Recurring cost	Only 8 Ltr. water/day	Water + ETP+ Softener + Boiler	Microwave –Almost zero running cost.
6.	Skilled Labour Required	No	Yes	Microwave- Fully automated does not require a skilled labour.
7.	IOT Enabled	Yes	No	Microwave- Uber tech with latest Internet centralized control & real time audit.
8.	Practical utilization in suburban & Rural areas.	Yes 1.5 Kw, low footprint, Solar Connectivity	No 10 Kw, dedicated room, no solar connectivity	Autoclave & require very high power & skilled manpower which is impractical in suburban & Rural areas
9.	Odours & Emission	Nil	Yes	Autoclave-Unpleasant odor as it uses steam for disinfection therefore in some cases it may be hazardous.
10.	Mobility (Onsite Treatment)	Yes	No	Microwave-Mobility which is essential to maintain point of care disinfection
11.	Metal Corrosion/Contamination	Nil	Very High	Autoclave- Corrosion/ Contamination occur due to water based disinfection process.
12.	Disinfection of Oil containing sample	Yes	No	Since oil does not dissolve in water it forms a protective layer against 'contact disinfection systems'. Microwave Non-Contact Technology
13.	Disinfection in High altitude hospitals	Yes	No	Autoclave is pressure & power dependant therefore redundant in high altitude.
14.	5 Year Cost per Installation	Rs. 22 Lacs	Rs. 34.5 Lacs	Autoclave is almost 40% more expensive

S.N.	Cost Parameter	Microwave	Autoclave
1.	Initial cost	Rs. 14,00,000 (Standalone)	Rs. 6,00,000 (Autoclave + ETP + water softener)
2.	Power Consumption @ Rs. 8/unit - (8 Cycle x 26 working days x 12 mts x 5 yrs)	(@ 1.5 Kw/hr)	(@ 10 Kw/hr)
		Rs. 1,49,760	Rs. 9,98,400
3a.	Skilled Labour- (Rs. 15,000 Sal x 12 mts x 5 yrs)	N/A	Rs. 9,00,000
3b.	Unskilled Labour- (Rs. 8,000 Sal x 12 mts x 5 yrs)	Rs. 4,80,000	N/A
4.	Water softner- (Rs. 1500/ mts x 12 mts x 5 yrs)	N/A	Rs. 90,000
5.	ETP maintenance - (Rs. 4000/ months x 12 mts x 5 years)	N/A	Rs. 2,40,000
6.	Maintenance Electro mechanical	(Rs. 2000 x 12 mts x 5 yrs)	(Rs. 4000 x 12 mts x 5 yrs)
		Rs. 1,20,000	Rs. 2,40,000
7.	Space Required (Rental)	(40sq.ft. @ Rs. 20sq.ft.)	(300 sqft @ Rs. 20sq.ft.)
		Rs. 48,000	Rs. 3,60,000
	Total Cost	Rs. 21,97,760	Rs. 34,28,400

If we compare the cost of Microwave with Autoclave for the period of 5 years then Microwave is **55.09%** cheaper than an Autoclave.

USPs of OptiMaser™ Microwave technology

- Non Contact technology with Zero emission / Discharge (NO ETP Required).
- Negligible running and maintenance cost.
- Rural Healthcare - Microwave An Ideal Solution.
- Resource efficient - Consumes Negligible Inputs.
- Time efficient - Disinfection Cycle Time 45 mins.
- Mobile - Plug & Play, 15 Amp, single phase (Solar Option).
- Disinfection Level 10^8 - 10^{10} : Highest Known to man.
- Indigenous, IoT Enabled, Full Proof & Point of Care - Gol Technology.
- Kills all virulent Micro-organism (Bacterial spores, Viruses, Hepatitis, AIDS, Vegetative germs, Fungi, parasites etc.) in an automated disinfection cycle at 100°C.