LOW-TEMPERATURE
HYDROGEN PEROXIDE GAS PLASMA STERILIZER
WE PRODUCE IN EUROPE AND EXPORT TO OVER 50 COUNTRIES
Why VAPORIZED HYDROGEN PEROXIDE STERILIZER?

• Hydrogen Peroxide vapor is a very effective sterilant for heat or moisture sensitive medical equipment.
• Can sterilize at low temperatures (40-55 °C).
• Can sterilize devices with long lumens.
• No toxic substance is used or released; the only by-products of the sterilization process are water and oxygen.
• Leaves no toxic residue: Sterilized loads can be used immediately.
• Complete sterilization in less than 30 mins with a Sterility Assurance Level (SAL) of 10-6.
• No need for any infrastructure other than electricity.
• Low cost of operation
• Low cost of ownership.
• Loads can be sterilized in ordinary sterilization packages.
Why GOLDBERG® S-MAX®?

• Designed for maximum sterilization at low temperatures, the GOLDBERG® S-MAX® series - with its scientific and technological innovations - provides excellent results under the most difficult conditions.

• Highest quality components are used to manufacture this device in order to provide a sustained, high performance over many years.

• Eryiğıt Medical Devices Corp. has over 20 years of experience in manufacturing medical devices in line with ISO9001, ISO 13485 and ISO14001 standards.

Tested and approved by German accreditation company Hygcen GmbH.
Examples of Equipments Suitable for H$_2$O$_2$ Sterilization

Vaporized hydrogen peroxide is an ultra-fast acting sterilizer. Also, it is gentle on most polymers (plastics) and non-woven textile products. Protective equipment (safety goggles, gloves, masks and other textile products) are made of materials which cannot withstand the hot steam in steam sterilizers. Ethylene oxide sterilization takes more than 12 hours due to long post-sterilization waiting period. Vaporized hydrogen peroxide (VHP) –on the other hand- can safely sterilize most protective equipment and clothes. Since it doesn’t leave any toxic residue, there is no required waiting time. Tools and equipment can be used as soon as sterilization is completed. That is 45 minutes with Goldberg S-Max VHP sterilizers.

Materials suitable for VHP Sterilization:
- Aluminium
- Stainless steel
- PTFE (Teflon)
- Silicone base polymers
- PVC (Polycarbonate)
- PMMA (Polymethyl Metacrylate)
- PC (Polycarbonate)
- EVA (Ethyl-Vinyl-Acetate)
- Latex
- Polyolefines
- Polyurethane
- Keratin
- PP (Poly-Prolylene)
Fastest Sterilization of Reusable Protective Equipment

- Endoscopes (including colonoscopes, duodenoscopes)
- Other lumen-tools
- Coter cables
- All surgical tools including
  1. Laparoscopic tools
  2. Robotic surgery tools and apparatus
- Surgical tools
- Ophtalmologic tools
- Masks
- Gloves and protective clothes

*(The suitability declared by the manufacturer of the material must be considered prior to sterilization with VHP.)*
OUR ADVANTAGES

Maximum Sterilization:

- Pulsed introduction of sterilant into the chamber enables the vapor to penetrate even the narrowest channels (lumens) without clogging them by condensation.
- Injection of hydrogen peroxide vapor from 6 different points to provide fast and homogeneous diffusion inside the chamber. This design also helps prevent the vapor inlet from being blocked by improperly placed sterilization load.

Maximum Safety:

- Repeated deep vacuuming after every sterilization cycle provides residue-free sterilization load.
- Two activated-carbon filters ensure no release of hydrogen peroxide vapor into the ambient environment.
- RF-ID system to prevent use of unauthorized sterilant cartridges.

Maximum Long-term Reliability:

- Highest quality components from World-renowned manufacturers.
- Cartridge system for injection of hydrogen peroxide ensures the highest possible repeatability in the amount of sterilant delivered onto the load.
- Corrosion-resistant H₂O₂ evaporator is never clogged.
- Sustained high performance operation over many years.

Efficient use of space:

- Increased useable volume by generating the plasma in a separate module outside the chamber. The plasma module is situated on the air path to the chamber. This enables ionizing the air taken during ventilations as well as ionizing the H₂O₂ vapor during sterilization.
- Anodized aluminum chamber of rectangular shape for efficient use of space. Useable volume close to the whole volume of the chamber.

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1. The cartridge system is more efficient and safer than other systems using high volume hydrogen peroxide agents such as bottles etc. Using hydrogen peroxide from capsules inside cartridges that are independent of each other protects the loads being exposed to too much sterilization agent, and also contact with air is avoided which stabilizes the agent.
2. As long as proper and timely maintenance is assured, this device has been designed to operate efficiently in mint condition for many years.
3. Contrary to common belief, application of plasma adds nothing on the sterilization power of H₂O₂ vapor. Plasma is created to speed up residual H₂O₂’s decomposition to water and oxygen. On the other hand, applying plasma inside the sterilization chamber is proven to cause secondary reactions that change the chemistry of top layers of some sensitive devices.
4. Aluminum is the most resistant metal against the corrosive effect of hydrogen peroxide. Anodized aluminum chamber preserves its shiny luster for many years.
Ultra-long Lifetime of Vacuum Pump:

- Goldberg S-Max excels particularly in the lifetime of its vacuum pumps. Our proprietary “Hygroscopic catalytic converter” is behind this success.
- S-Max is equipped with a proprietary catalytic converter which is also highly hygroscopic. The converter adsorbs H2O2 vapor and converts it to water vapor. It achieves ultra-fast conversion of residual H2O2 into water and oxygen before the vacuum pump.5
- Owing to its hygroscopic nature, it sustains very slow release of water vapor to the vacuum pump. As a result, our vacuum pumps last for years without any failures.

Maximum User-friendliness:

- Color-illuminated logo: Enables checking the status of the device/sterilization cycle visually from distant locations.
- Fully automated operation covers vacuum leak check and humidity check. They are all automatic! The operator simply chooses the program and presses its button on the touchpad screen.
- Foot pedal to open the door while hands are busy.
- Proprietary pre-conditioning algorithm minimises process cancellations due to unsufficiently dried load.

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5- Hydrogen peroxide (H2O2) is converted to water and oxygen (2H2O2 →2H2O + O2) after the sterilization cycle.
### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>GP 80</th>
<th>GP 120</th>
<th>GP 135</th>
<th>GP 160</th>
<th>GP 200</th>
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<tbody>
<tr>
<td><strong>Device / Chamber Width (mm)</strong></td>
<td>735/453</td>
<td>735/453</td>
<td>735/453</td>
<td>735/453</td>
<td>735/453</td>
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<tr>
<td><strong>Device / Chamber Height (mm)</strong></td>
<td>1885/402</td>
<td>1885/402</td>
<td>1885/402</td>
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<td>1885/402</td>
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<tr>
<td><strong>Device / Chamber Depth (mm)</strong></td>
<td>1000/450</td>
<td>1000/700</td>
<td>1000/750</td>
<td>1250/890</td>
<td>1300/1120</td>
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<tr>
<td><strong>Weight (kg)</strong></td>
<td>330</td>
<td>350</td>
<td>380</td>
<td>400</td>
<td>440</td>
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<tr>
<td><strong>Effective Volume (L)</strong></td>
<td>81</td>
<td>126</td>
<td>135</td>
<td>160</td>
<td>200</td>
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<tr>
<td><strong>Double Door</strong></td>
<td>No</td>
<td>Yes (Optional)</td>
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<tr>
<td><strong>Chamber Shape</strong></td>
<td>Rectangular Prism</td>
<td></td>
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<tr>
<td><strong>Chamber Material</strong></td>
<td>Aluminum</td>
<td></td>
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<tr>
<td><strong>Trays</strong></td>
<td>2 (each with 30 kg loading capacity)</td>
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<tr>
<td><strong>Printer</strong></td>
<td>Yes (USB Optional)</td>
<td></td>
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<tr>
<td><strong>H₂O₂ Concentration</strong></td>
<td>%59 (%40 Optional)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Touchscreen</strong></td>
<td>7” (10.4” Optional)</td>
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<td><strong>Foot-Operated Door Opening</strong></td>
<td>Yes</td>
<td></td>
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<tr>
<td><strong>RF Plasma</strong></td>
<td>500 W (Optional)</td>
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<tr>
<td><strong>Electricity Connection</strong></td>
<td>3-Phase, 380 V, 50/60 Hz</td>
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<tr>
<td><strong>Sterilization Temperature</strong></td>
<td>45 °C</td>
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<tr>
<td><strong>Sterilization Duration</strong></td>
<td>18-57 minutes</td>
<td></td>
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<tr>
<td><strong>Ventilation</strong></td>
<td>HEPA filter (0.01 m³)</td>
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<tr>
<td><strong>Plasma Position</strong></td>
<td>On the top of the Chamber</td>
<td></td>
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<td></td>
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<tr>
<td><strong>Excess Moisture Alarm</strong></td>
<td>Yes</td>
<td></td>
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<tr>
<td><strong>Warming Time</strong></td>
<td>&lt; 15 minutes</td>
<td></td>
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<td><strong>Electronic Control</strong></td>
<td>Microprocessor</td>
<td></td>
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<tr>
<td><strong>Vacuum Pumps / Gauges</strong></td>
<td>Leybold (Germany) or Ulvac (Japan)</td>
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### PROGRAMS

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>DURATION (MIN)*</th>
<th>NUMBER OF CAPSULES</th>
<th>EXPLANATION</th>
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<tbody>
<tr>
<td>No Lumen</td>
<td>28</td>
<td>2</td>
<td>No Lumen Tools. Devices with simple geometry (Load &lt; 5 kg)</td>
</tr>
<tr>
<td>Standard</td>
<td>45</td>
<td>2</td>
<td>All No Lumen tools and devices Endoscopes and other lumen tools (Lumen diameter &gt; 1.5 mm)</td>
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<tr>
<td>Intensive</td>
<td>57</td>
<td>2</td>
<td>All standard program tools and devices Endoscopes and tools with a long lumen and narrow channel (Lumen diameter &gt; 0.7 mm)</td>
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<tr>
<td>No Lumen E</td>
<td>22</td>
<td>2</td>
<td>OPTIONAL. Only the top shelf, surface characterization (Load amount &lt; 3 kg)</td>
</tr>
</tbody>
</table>

*The actual duration can be longer depending on the size and humidity of the load.
CONSUMABLES

- H₂O₂ Cartridge
- Ventilation Filter (HEPA)
- Vacuum Pump Oil Filter
- Process Validation Device
- Vacuum Pump Foreline Filter
- Active Carbon Exhaust Filter
WE DEVELOP NEW TECHNOLOGIES FOR LIFE

Made in TURKEY