




**UVC-Tunnels for 3-4 logs disinfection inside Jars at 1500 to 15000 jars per hour.**

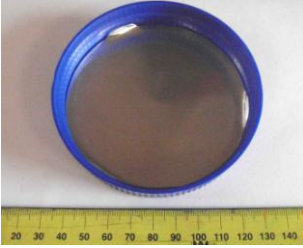
Disinfecting inner surfaces of jars on conveyer lines with UVC light at high production rates is the preferred choice of non-invasive (clean) disinfection. This production step is necessary to assure a safe filling jars with a product and then capping them.

The major challenge here is in delivering UVC light in sufficient doses to jar's areas between jars opening and its strait walls.

This challenge is positively resolved by our UV optics and is proved in tests as shown on Table 1 below:



**Table 1:**  
**typical jars for peanut butter, mayonnaises, etc. and its lid.**  
 The jar on the right: 1.9l (64 Oz),  
 on the left: 0.48l, (16 Oz).



Arrows show the direction of UVC light from above into jars and positions of UVC sensors to measure UVC doses. Jars were prepared to test custom UVC optics while imitating jars in-line advancements.

Lids are disinfected while sliding on rails under a UVC module.

The maximum speeds can be reached for simplest cases of disinfecting from common E-coli, Salmonella and Listeria at 3 to 4 logs (99.9% to 99.99% reduction). De-activating common spores requires higher UVC doses, see Table 2 below. Respective equipment is possible to construct as custom-made.

**Table #2: Required UVC doses [#1] in mJ/cm<sup>2</sup> for**

(average data)	3 logs	4 logs	Achieved for ave. 3000 J/h under "neck"
E-Coli	6	9	Ca. 70 mJ/cm <sup>2</sup> , to get the same dose at higher speeds a stronger UVC lamp is to be used (available)
Salmonella	4	6	
B. Subtilius	60	80	

**Table#3:** other common jars and its speeds for 3-4 logs deactivation of common bacteria on production lines.

<p><b>3.9 lts jars for mayonnaise,</b> HDPE, H.-25.0 cm, D:15.0 cm. Opening-9.7 cm. Rate 1,500 jars/hr. (ca. 1J/ 2 s),</p> <p><b>Lid:</b> D-11.5 cm, Heght.-1.8 cm. HDPE.</p>		<p><b>Squishable jar with a capacity of.-400 ml.</b> Hight.-20.5 cm. Width.-4.0 cm. Large.-8.0 cm, Opening 2.5 cm. <b>1,200 jars/hr.</b> Lid: D3.5 cm; H-2.0cm:</p>	
<p><b>374 ml Jar</b> Hight.-13.0 cm. D.-6.5 cm. Opening-5.5 cm. rate 1200 j/h. Lid diameter.-6.5 cm. Lid hight.-1.9 cm. same as for #1</p>		<p><b>758 ml Jar.</b> HDPE H.-16.0 cm, D-7.9 cm. Opening 5.5 cm.</p> <p>Lid: D-6.5cm. H.-1.9 cm. Filling rate.-<b>1,200 J/h.</b></p>	

The evaluation of UVC doses plus disinfection tests at a food lab on customer jars along with a selection of a UVC disinfection process allows to customize UVC tunnels for disinfection of both inner and outer surfaces of jars at speeds between 500-15000 J/hr. The design and costs of such tunnels depend on jars size, its rate per hour and disinfection requirements.

Higher production speeds and 3 -4 logs deactivation rates for common spores can be also reached with compact PUV tunnels.

**Please, send your requirements to [info@steribeam.com](mailto:info@steribeam.com)  
For information on our UV tunnels please, visit our website.**

**Ref.:** #1: IUVA News / Vol. 8 No. 1, 2006: Tables for UV Doses Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa and Viruses. [www.IUVA.org](http://www.IUVA.org)

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