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Posted by Anonymous on Thu, 2015-11-19 17:50

Pressure cookers: I have read the SOP on preparing agar plates. Is it recommended to have the circular pressure gauge that has a series of numbers showing you the pressure as it goes up, or is it okay to use a good model Hawkins/Tefal etc. that has the ordinary pressure regulator on top. One of the models I have seen reaches 170° C.

I am looking to upgrade what is in stock at a school that only takes 100 ml conical flasks and looks like there is no pressure seal and cannot find a manual specific for the iSA pressure cooker.

Voting:



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Laboratory Technicians:

Laboratory Technicians

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Answer by barney41 on question Pressure cookers

Submitted by barney41 on 19 November 2015

In Brief

It is recommended that a pressure cooker used for the sterilisation of agar and microbiological waste be equipped with a pressure gauge that indicates the pressure and temperature within the unit. The pressure cooker must be able to reach a pressure of 15 psi (103 kPa) and a temperature of 121° C to ensure items are sterilised.

Further, it is recommended that sterility verification strips be used to indicate that these conditions have been met, ensuring that sterility of the load has occurred.

When considering purchase of a pressure cooker, it should be kept in mind that many domestic pressure cookers do not meet these requirements. There are many pressure cookers available that are specifically designed for use in laboratories from various scientific suppliers. See the Science ASSIST [School science suppliers](#) list.

Additional Information

Effective sterilization is achieved when all viable organisms are eliminated^[i]. The most effective and suitable method of sterilising agar is by using moist heat in the form of steam under pressure i.e. 121° C for 15 minutes at 15 psi (pounds per square inch). This method will denature & coagulate enzymes and other cell constituents in the bacterial cell including any spore formers. Sterilization can be guaranteed only when these parameters are reached. Sterilization of agar and plates is usually done in an autoclave or a commercially available pressure cooker with a gauge and the capacity to reach 15 psi. At a pressure of 15 psi inside the autoclave, the temperature is said to be 121° C. Exposure of articles at these parameters for 15 minutes sterilizes them. ^[ii]

A pressure cooker, (pressure steam steriliser) or an autoclave is commonly used in the laboratory to effectively sterilise microorganisms and agar. Pressure cookers and autoclaves reach the recommended temperature and pressure required to render most microorganisms and agar sterile.

To maintain sterilization at 121° C for 15–20 minutes at 15 psi (pounds per square inch), the following considerations must be given when purchasing a pressure cooker.

- Ensure the pressure cooker is an adequate size for the items to be sterilised. Space is

required around items for steam to circulate.

- The pressure cooker must contain a pressure gauge and be able to reach a pressure of 15 psi (103 kPa) and a temperature of 121° C.

Note that some domestic pressure cookers do not meet these requirements.

For further information on the use of pressure cookers and sterilising see the following resource material developed by Science ASSIST.

AIS: Sterilising Agar: This ASSIST Information Sheet details how to sterilise agar. Microwave, pressure cooker or autoclave? Recommendations for best practice.

SOP: Operating a pressure cooker and autoclave: Standard Operating Procedure (SOP) and detailed method for operating a pressure cooker and autoclave.

[i] http://textbookofbacteriology.net/control_2.html Control of Microbial Growth (page 1)
Kenneth Todar PhD

[ii] www.microrao.com/micronotes/sterilization.pdf Sridha Rao, Dept of Microbiology, JJMMC, Davangere

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