

Autoclave

[Health & Medicine](#)



**ASSIGN
BUSTER**

AUTOCLAVE INTRODUCTION Sterilization is a process which involves entire eradication and inactivation of all organisms. The process of sterilization can be done by:

Moist heat

Dry heat

Irradiation

Chemicals

Gases

Filtration (Ribbons and Norris, 1969).

AUTOCLAVING

Autoclaving is done in autoclaves. Autoclaves provide sterilization by providing steam. Autoclaves are instruments that use steam under high pressures and sterilize things such as gauze, dental instruments, surgical instruments and sterile solutions. They also sterilize and disinfect blood products such as cultures and specimens. Autoclaves can be of different sizes. Large autoclaving systems obtain steam from steam generators whereas small autoclaves get steam from boiling water. Typical internal autoclave settings are 121 degrees centigrade for 15-20 minutes at 15 pounds per square inch (Estridge et al, 2000).

INFLUENCE OF PRESSURE

The relationship between temperature and pressure is a directly proportional one. In chemistry when the pressure of a gas rises, the temperature of the gas increase correspondingly too. With this principle in mind steam is a gas used in the autoclave chamber. Increasing its pressure in a closed system will lead to increase in temperature. At higher temperatures water molecules of the steam become more invigorated. At this vigorous speed the

<https://assignbuster.com/autoclave/>

molecule's penetration escalates. This principle proves to be advantageous because it reduces the time taken by the things in the autoclave to sterilize (Hussain, 2009).

DIFFERENCES BETWEEN DRY HEAT AND MOIST HEAT

As mentioned above dry heat and moist heat can both provide sterilization but they differ in some manners. Dry heat accounts on oxidizing molecule for its action. Dry heat's mechanism of action is slower than moist heat. Dry heat penetrates walls of substances much slower than moist heat. Dry heat is used in sterilizing glass products, oils and powders. Due to its slow mechanism of action sterilization by dry heat is done at 171 degrees centigrade for 1 hour and the time may increase depending on volume. Dry heat may also be used in the shape of an open flame used to sterilize inoculating loops, mouths of pipettes and culture tubes.

On the other hand moist heat destroys organisms by the denaturing proteins and also by disrupting the membrane of lipids. Moist heat is favored because of its penetration powers. It is known that the most resistant spores require a temperature of 121°C for around half an hour to denature. Hence moist heat application is more effective compared to dry heat sterilization. This can also be proven by the fact that moist heat, sterilization can be completed at lower temperatures in lesser time. Culture media, flammable and heat-sensitive items, liquids and dense loads can be sterilized by moist heat (Black, 2015).

REFERENCES

Ribbons, D. W., & Norris, J. R. (1969). *Methods in microbiology: Volume 1*. London: Academic Press.

Estridge, B. H., Reynolds, A. P., & Walters, N. J. (2000). *Basic medical laboratory techniques*. Albany, N. Y: Delmar Publishers.

<https://assignbuster.com/autoclave/>

Hussain, Mazhar, (2009). Autoclaving: Real Sterilization retrieved from <http://microbiologyon-line.blogspot.com/2009/08/autoclaving-real-sterilization.html>

Black, J. G., & Black, L. (2015). Microbiology: Principles and explorations.