Autoclave Validation and Training Methods

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Introduction

- The Autoclave
- Methods used in Daily Validation
- Monthly Validation Methods
- Training Methodology

Principles of Steam Sterilization

- **Sterilization**: the complete destruction of all forms of microbial life, including bacterial spores

- Steam under pressure reaches high temperatures

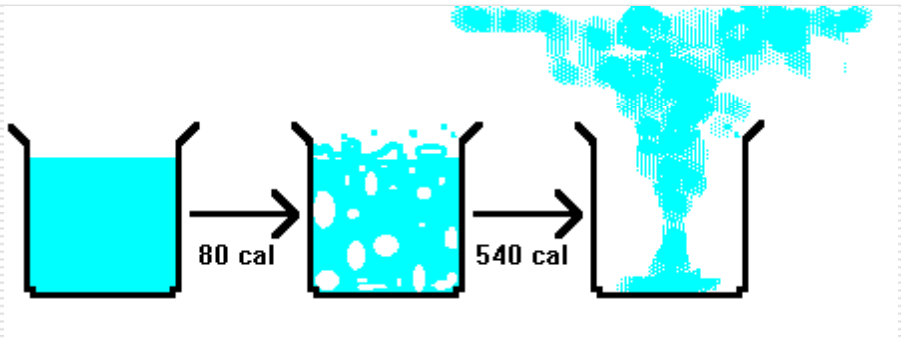
Standard Temperature and Pressure

- **Calorie**: The amount of energy required to heat one gram of water one degree Celsius

- 250 °F (121 °C) and 15 p.s.i.

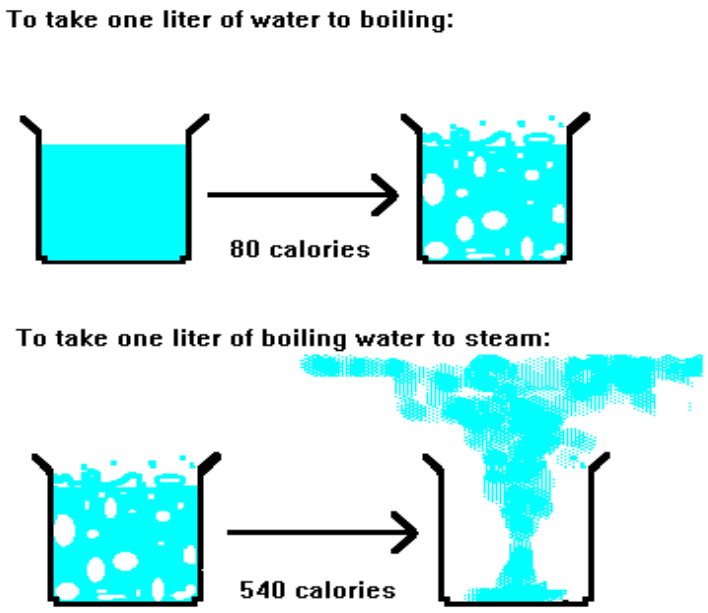
Principles of Steam Sterilization (cont.)

- The “killing power” of steam is due to its **latent heat of vaporization**
  - 80 calories: 1 L water to boiling
  - 540 calories: 1 L boiling water to steam



Latent Heat of Vaporization

- For example:



Action of Steam

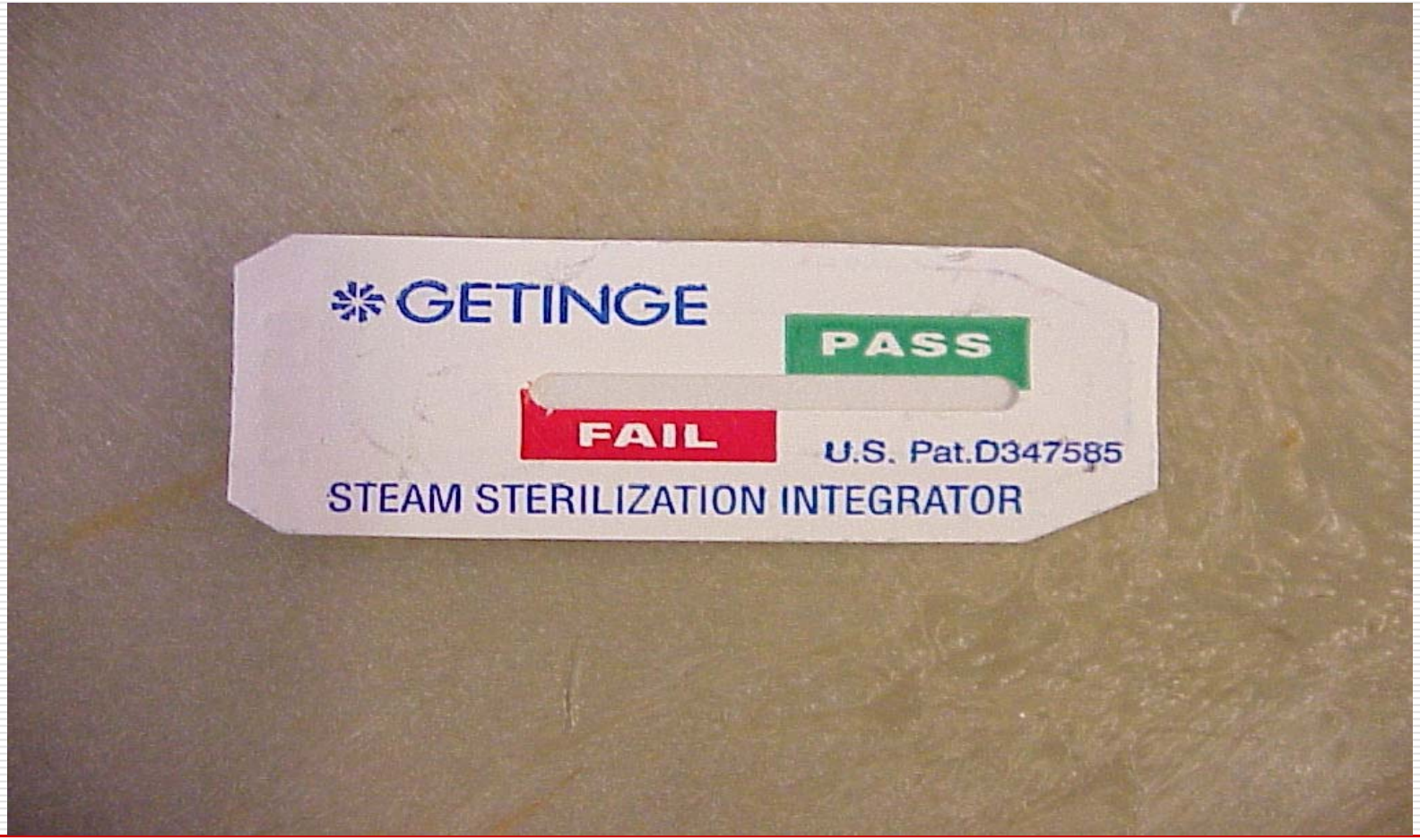
- Steam contacts a cooler surface, condenses, causing a huge decrease in volume and setting up a negative pressure that draws more steam
- Condensation occurs as long as there is a temperature differential
- Action of steam ensures: Surface heating, penetration, and protein coagulation

Daily Methods of Validation

- Steam Sterilization Tape
- Steam Sterilization Integrator
- Autoclave Printer Readout

Autoclave Steam Tape

Steam Sterilization Integrator




GETINGE
PASS
FAIL
U.S. Pat.D347585
STEAM STERILIZATION INTEGRATOR


GETINGE
PASS
FAIL
U.S. Pat.D347585
STEAM STERILIZATION INTEGRATOR

Autoclave Printer Readout

EXPOSURE TEMP 121 DEG C.
EXPOSURE TIME 01:00
DRY TIME 00:05
LOAD CONTENTS .....

.....

.....

CONDITIONING YES
EXPOSURE 01:01 YES
TEMP MIN 122 MAX 122 DEG C.
PRES MIN 32.6 MAX 33.0 PSIA
CYCLE COMPLETE YES
CYCLE TIME 04:42
CYCLE HAD NO WARNING
CAUTION 06 12:57:27AM
VERIFIED BY .....

QUALITY ASSURANCE

01:13:56 -0.02 219.4
GRAVITY DRY

01:12:21 16.83 251.4
EXHAUST

00:12:20 16.88 251.3
EXPOSURE

00:10:52 0.43 210.4
HEAT-UP

00:09:14 0.46 210.5
CONDITIONING5

00:07:34 0.48 210.5
CONDITIONING4

00:05:52 0.42 210.2
CONDITIONING3

00:04:01 0.46 209.8
CONDITIONING2

00:02:16 8.22 229.1
CONDITIONING1

00:00:17 2.46 120.1
PURGE

PROGTIME DF03 A100

PROGRAM: P1 GRAV WRAP 1

A100 CHAMBER TEMP
DF03 CHAMB PRESS/PSIG
SIGNALS

DRY TIME 00:00:00

- Autoclave Steam Tape: Only use is to denote that something needs to be autoclaved
- Steam sterilization Integrator: Time released wax window will indicate whether or not a complete autoclave run was achieved, use more than one per run
- Autoclave Printer Readout: Electronic, hard copy record of everything the autoclave experiences during the course of a decon run

Biological Indicators

- The conventional biological indicator is a carrier that is inoculated with *Geobacillus stearothermophilus*, placed into its primary pack, which is a self-contained unit that also houses a unit of growth medium, and is ready for use.

- provides a defined resistance to the specified sterilization process.

Questions

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