

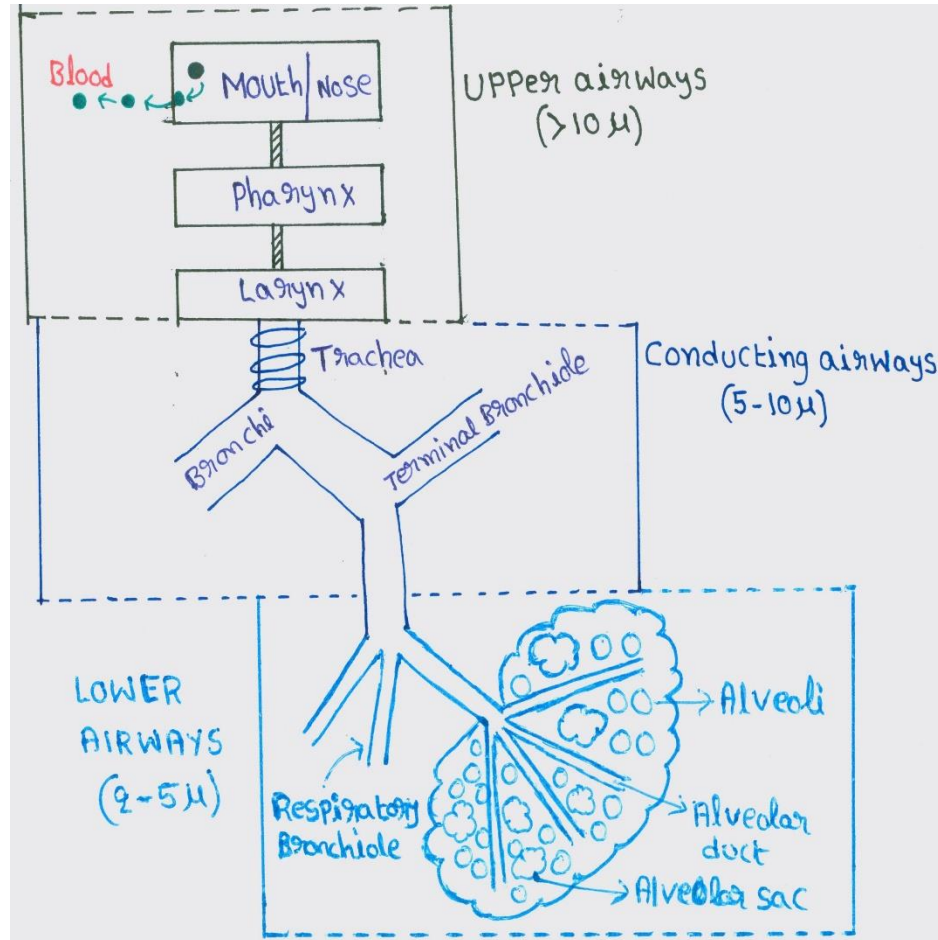


# AEROSOL

**PRESENTED BY:**  
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**PHARMACY OFFICER,**  
**JHARKHAND.**

# INTRODUCTION

Fine dispersion of **solid** or **liquid** distributed in air, where the particle/droplet size is  $< 50 \mu$



PARTICLE SIZE	SITE OF DEPOSITION
Larger particles ( $>10 \mu$ )	Upper airways
Moderate size particles ( $5-10 \mu$ )	Conducting airways
Smaller particles ( $2-5 \mu$ )	Lower airways
Very small particles ( $<2 \mu$ )	No site to deposit

## NOTE:

Particle size in inhalation aerosols can be calculated by using,

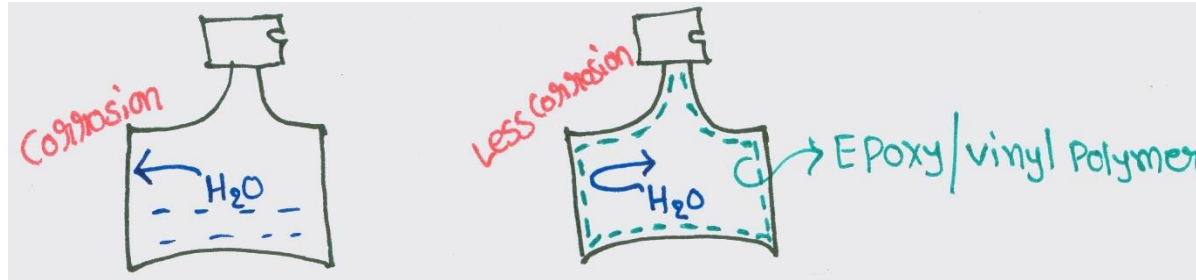
- a) **Cascade impactor**
- b) **Light scattered decay**

# BASIC AEROSOL TECHNOLOGY

## i. CONTAINERS

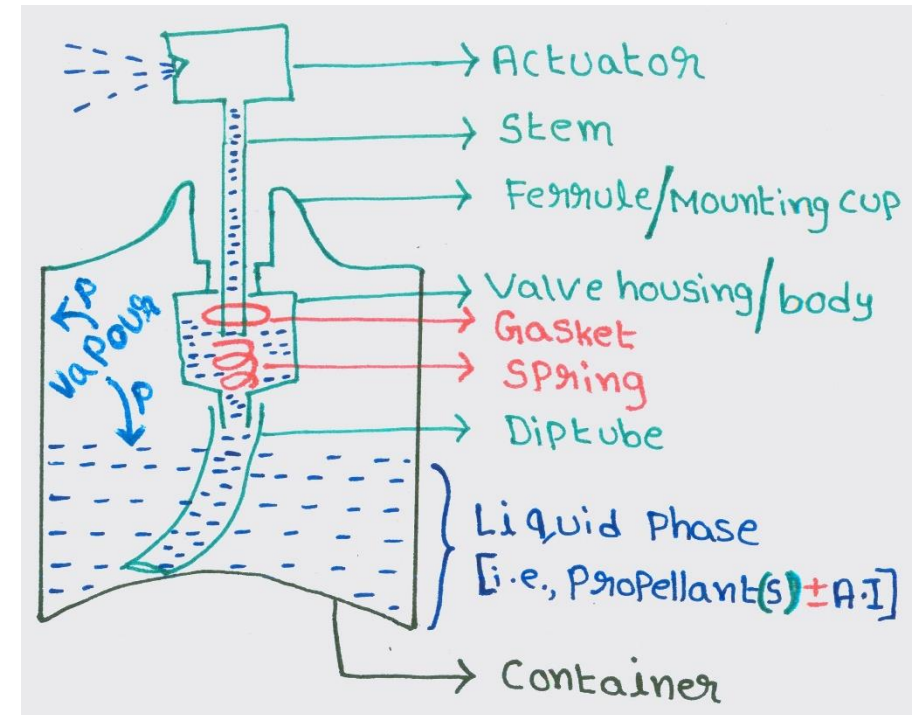
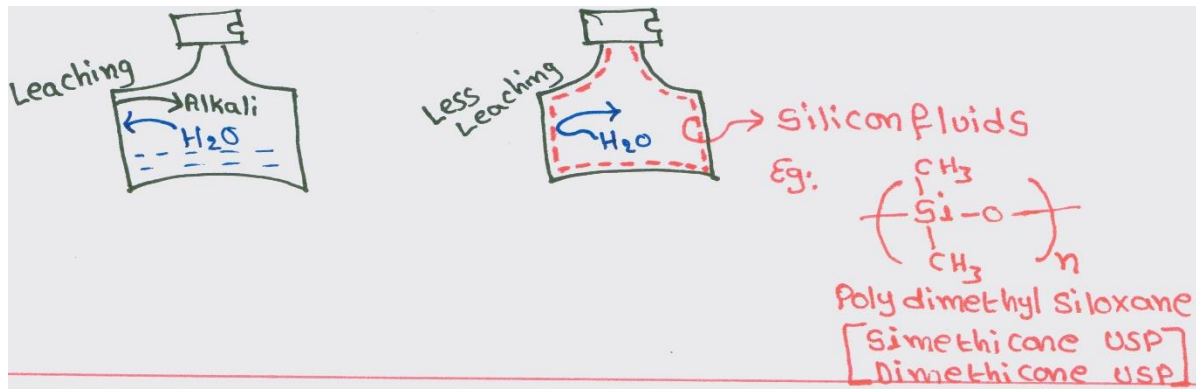
### A) Metal (s)

- ✓ Withstand a pressure of **140-180 psig** at **130° F**



### B) Glass

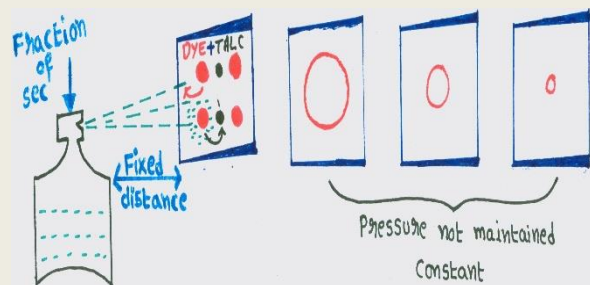
- ✓ Withstand a pressure of **<18 psig** at **70° F**



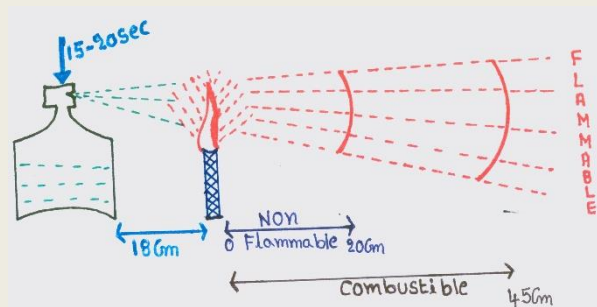
### NOTE:

Moisture content in inhalation aerosols can be determined by using,

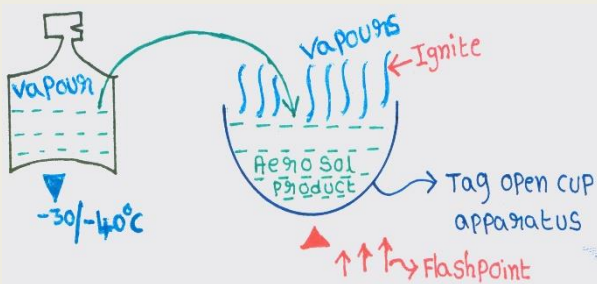
- Karl Fischer Titration**
- Gas Chromatography**



**Spray Pattern Test**

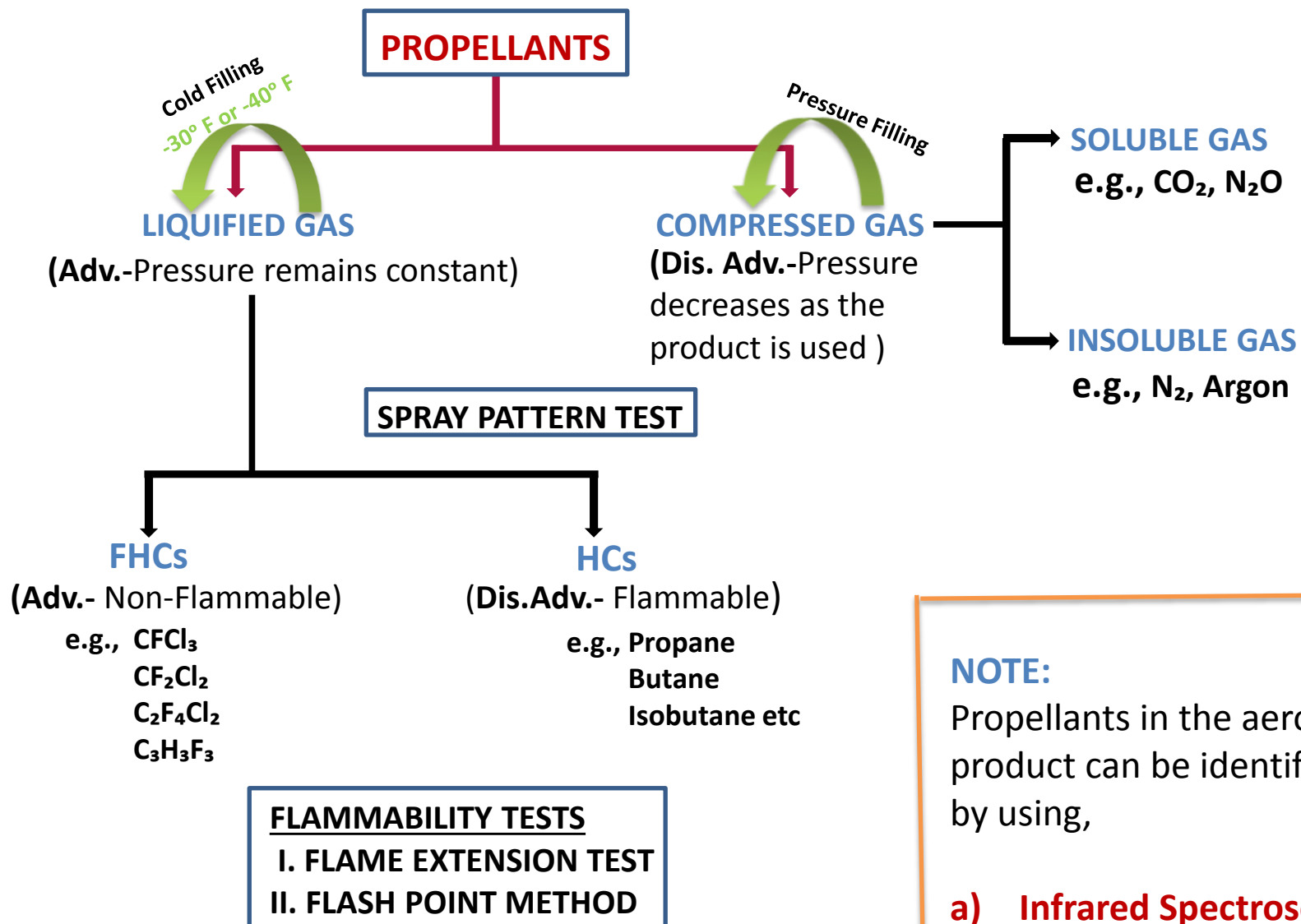


**Flame Extension Test**



**Flash Point Method**

## ii ) PROPELLANTS

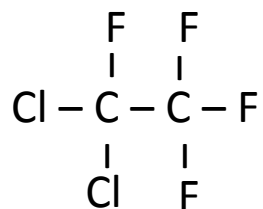
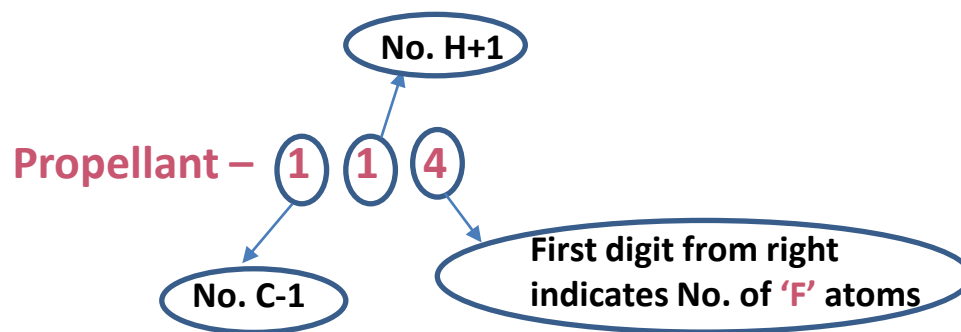
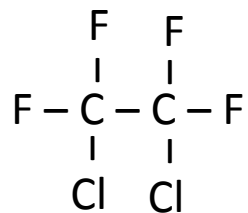


### NOTE:

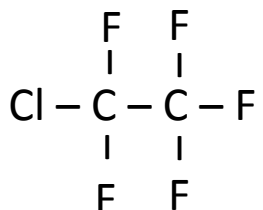
Propellants in the aerosol product can be identified by using,

- Infrared Spectroscopy
- Gas Chromatography

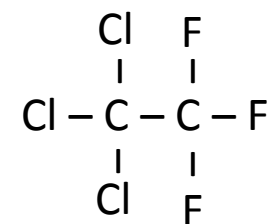
# Nomenclature of Fluorinated Hydrocarbon Propellants



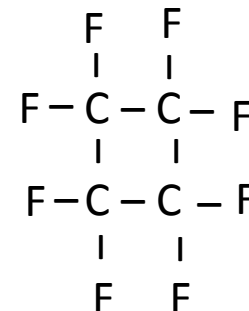
P – 114 a



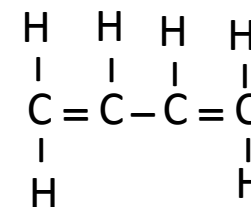
P – 115 a



P – 113 b



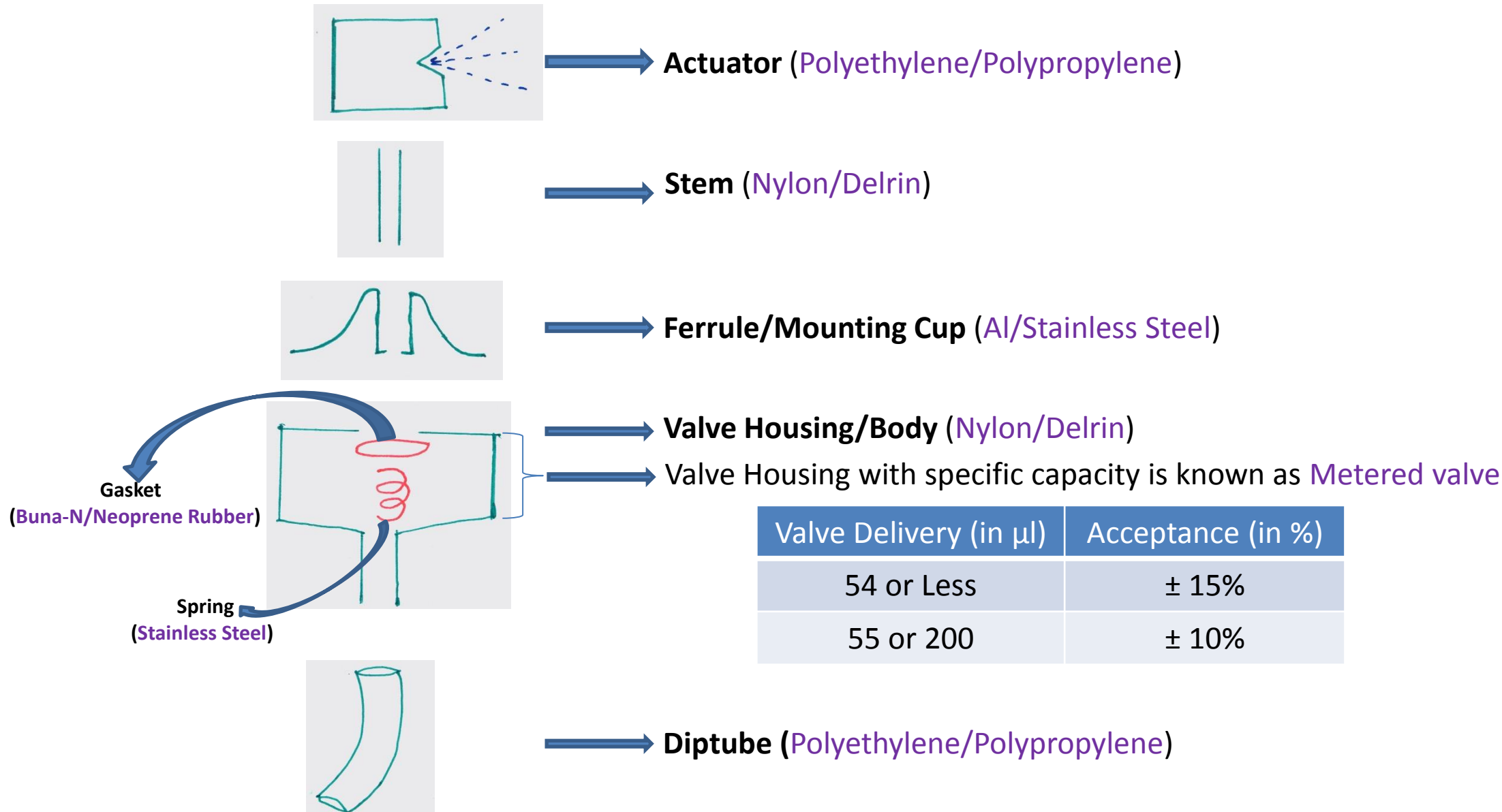
P – C 318



P – 2 370

No. of Unsaturation

### iii. Valves





# TESTING OF AEROSOLS

According to Department of Transportation (DOT) guidelines, following evaluation tests are performed for aerosols

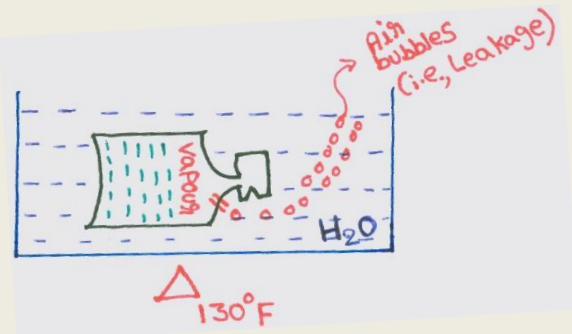
- I. Leakage test
- II. Measurement of Particle Size
- III. Determination of Moisture Content
- IV. Identification of Propellants
- V. Spray Pattern Test
- VI. Flammability Test
- VII. Determination of Foam Stability

Foam Stability of aerosols can be determined by using Rotational viscometers.

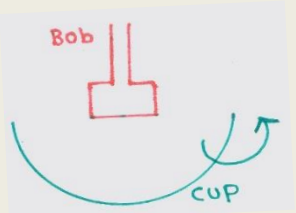
- Cup and Bob Viscometer
- Cone and Plate Viscometer

Couette type (Cup in Rotation)  
e.g., Mac Michael Viscometer

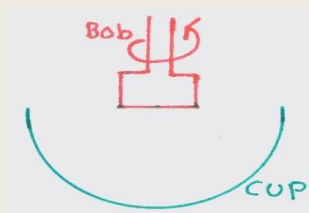
Searl type (Bob in Rotation)  
e.g., Stormer Viscometer  
Haake Roto Visco Viscometer  
Brookfield Viscometer



**Leakage Test**

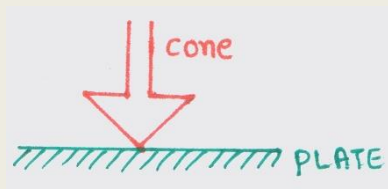


**Couette type**



**Searl type**

**(Cup and Bob Viscometers)**



**Cone and Plate Viscometer**

**GPAT 2019**

Q). In case of aerosol testing, valve delivering acceptance criteria for a volume of 54  $\mu$ l or less is:

- A)  $\pm 5\%$       B)  $\pm 10\%$       C)  $\pm 75\%$       **D)  $\pm 15\%$**

**GPAT 2019**

Q). Which of the following oxide is not used for achieving amber color to glass?

- A) Carbon      B) Iron      **C) Cobalt**      D) Manganese

**GPAT 2018,GPAT 2012**

Q). Containers used for Aerosols should withstand a pressure of

- A) 130 – 150 Psig at 130°F  
**B) 140 – 180 Psig at 130°F**  
C) 140 – 170 Psig at 120°F  
D) 120 – 140 Psig at 120°F

**GPAT 2011**

Q). DOT is performed for which of the following

- A) Strip packing      **B) Aerosol**      C) Injection packing      D) Glass containers

**NIPER 2009**

Q). Imagine that you are developing an aerosol drug formulation to the delivery of drugs into conducting air ways which particle size you will choose

- A)  $>10 \mu$       **B)  $5 - 10 \mu$**       C)  $<2 \mu$       D) All of the above





THANK YOU



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