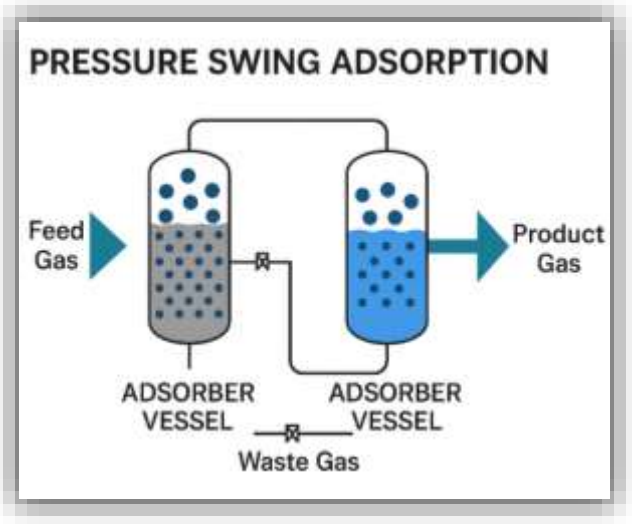
PSA SYSTEM

A PSA system separates certain gases from a mixture under pressure, using adsorption on a solid material (adsorbent).Different gases are adsorbed at different rates under high pressure, allowing selective separation. The cycle swings between high pressure (adsorption) & low pressure (desorption), hence "Pressure Swing."



APPLICATIONS

- Nitrogen generation from air.
- Hydrogen purification in refineries & ammonia plants.
- Biogas upgrading for removing CO_2 and impurities.
- Drying of gases (removing moisture).
- On-site PSA systems supply hospitals with 95–99% pure O_2.

MAJOR ELEMENTS

- Adsorption beds pressurized vessels packed with selective absorbents.
- Adsorbents like zeolites, carbon molecular sieves, activated adsorbents
- Valve & piping skid manages phase control and gas routing
- Control system orchestrates cycle timing, automation and safety.
- Tail gas systems stabilizes and handles purge exhaust.

TECHNICAL PARAMETERS

Parameter	Typical Values / Notes
Cycle Time	2–10 minutes (standard PSA)
Adsorption Duration	~7.9 s; Equalization ~0.9 s; Flow ~2.3 L/min yields ~96.7% O_2 purity
Purity (N_2)	95% – 99.999% (depending on adsorbent design)