50 YEARS PROTECTING LIVES AND PROPERTY

CONSTANT FLOW TECHNOLOGY™

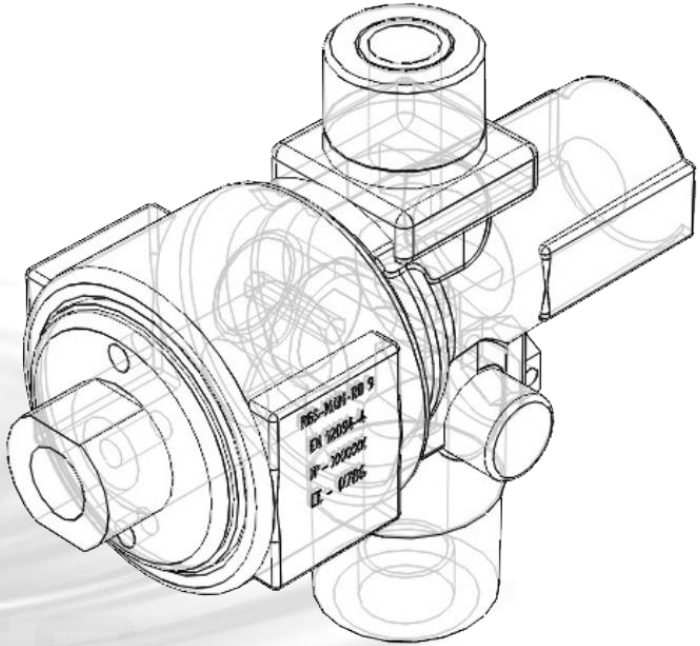
Overview

INDEX

I. Use of inert gases
- Why to use
- Inert-based firefighting systems

II. Constant flow technologies
- Inert-Siex™ CFT
- Comparison
- Advantages

III. Conclusions



WHY TO USE INERT GASES?

- ✓ Excellent fire fighting effectiveness

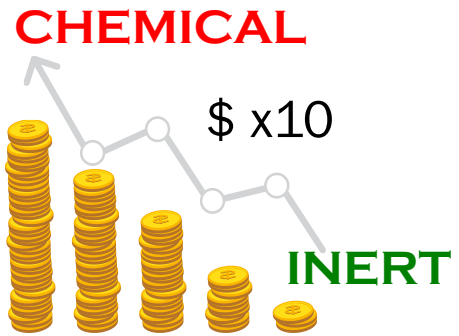
Atmosphere:
- 78% N_2
- 21% O_2
- 1% Others

- ✓ The only **truly ecologic** gas:
  zero negative effects

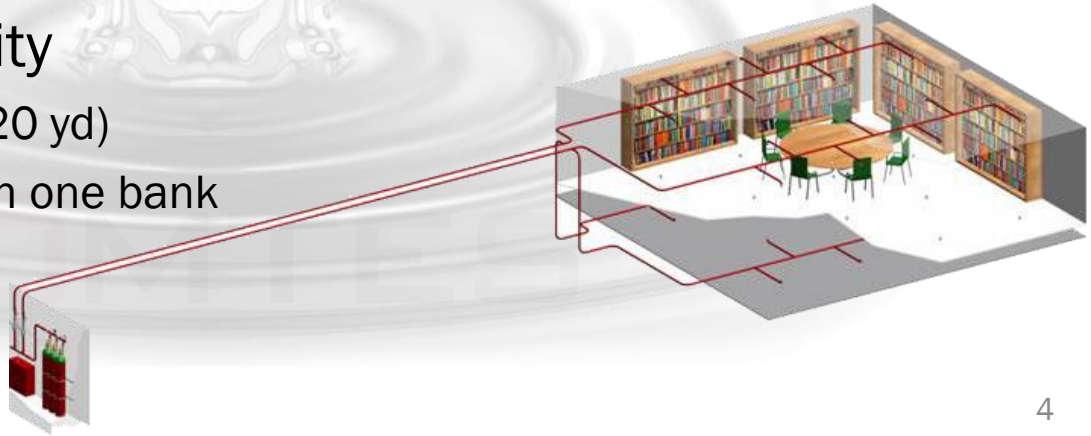
	Halon 1310	HFC-23	HFC-227ea	Novec	Inert gases
Ozone Depletion Potential (ODP)	10	0	0	?	0
Greenhouse Warming Potential (GWP)	6.900	14.800	3.800	?	0
Atmospheric lifetime	65	243	36,5	?	n/a

WHY TO USE INERT GASES?

- ✓ Best value agent
  - Up to 10 times less expensive (chemical gases)
  - 99,99% pure, dry and cheap inert gas stored in cylinders
  - Low maintenance and recharge costs

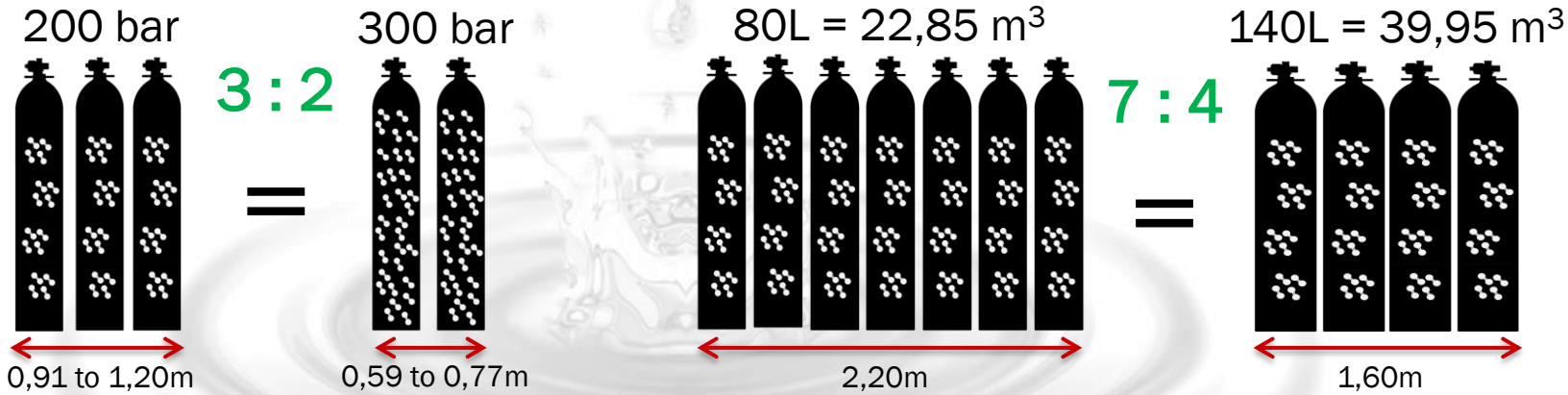


- ✓ Long distance capacity
  - 120 – 200 m (130 – 220 yd)
  - Multiple protections with one bank (selector valves)



WHY TO USE 300 BAR?

- ✓ More compact hardware

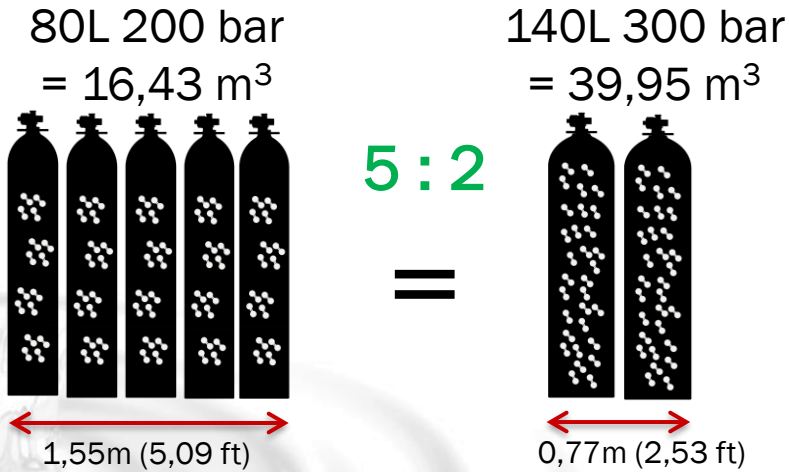


Pressure increase ⇨ –33 % cyl.

Volume increase ⇨ –43 % No. cyl. +75% capacity

WHY TO USE 300 BAR?

Pressure & volume increase ⇨ **–60 % No. cyl.**
+75 % capacity



✓ More cost efficient

✓ Less space consumed

IMPACT OF STANDARD INERT SYSTEMS

Restrictor regulation

- Fixed calibration (hydraulic calculation)
- As storage pressure drops so does outlet pressure

→ Not efficient pattern

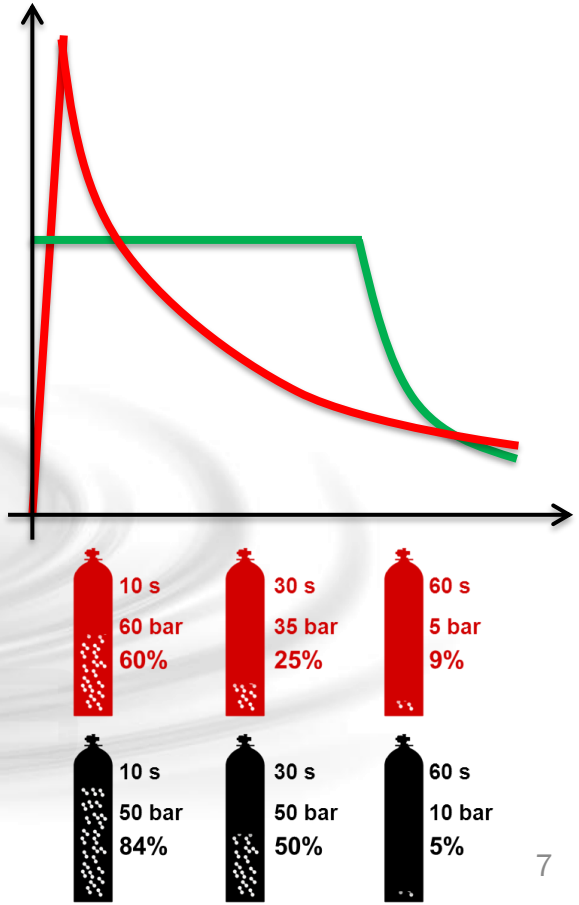
→ Pipework sized to a **high but brief** pressure

Constant Flow Technology

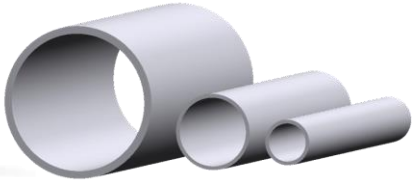
- Fixed outlet pressure, adjustable opening
- As storage pressure drops, outlet area increases

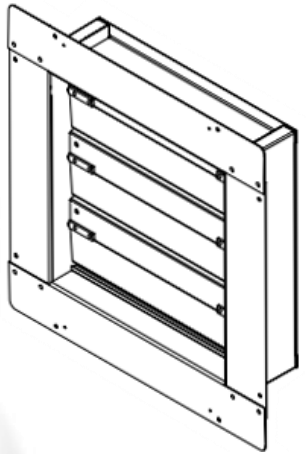
→ Very efficient pattern

→ Pipework sized to a **lower and constant** pressure

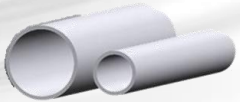


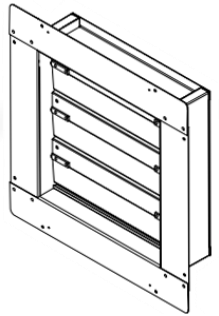
How does this election affect systems?





- Restrictor
  - Everything is sized to a big but brief pressure:
    - Larger diameters
    - More resistant pipes: SCH160/80, thicker, heavier, more expensive
    - Larger venting areas
- Constant Flow technologies
  - Rational and optimized design
  - sized to a **lower and constant** pressure:
    - Smaller diameters: ½'' less, so costs go down
    - Less resistant pipes: SCH40, lighter, manageable, cheaper
    - Venting areas reduced
    - Less noisy discharges



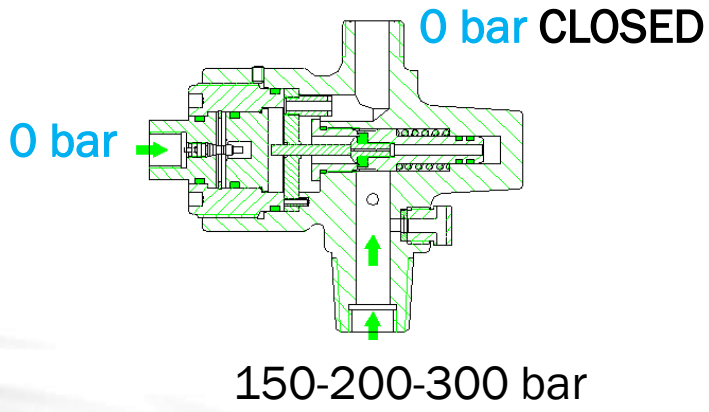


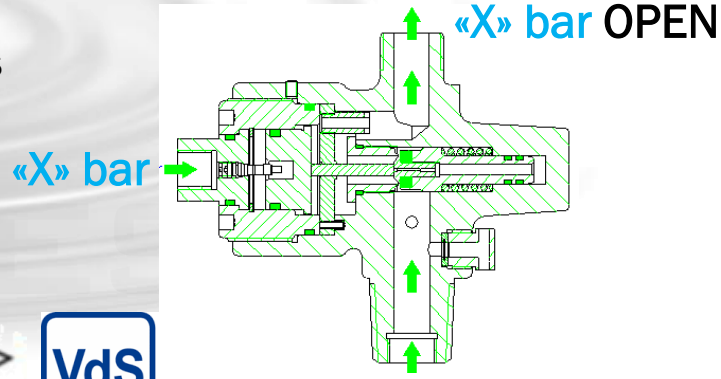
Do all constant flow valves work the same?

- NO, our pneumatic regulation system has a much better performance

	SIEX CFT	Others
Regulation	- Pneumatic - Static equilibrium	- Mechanical - Dynamic equilibrium
Pros	✓ No variations in flow ✓ Consistent behaviour ✓ Customized discharge pressure	
Cons		✖ Pressure and flow vary ✖ Non-predictable behaviour

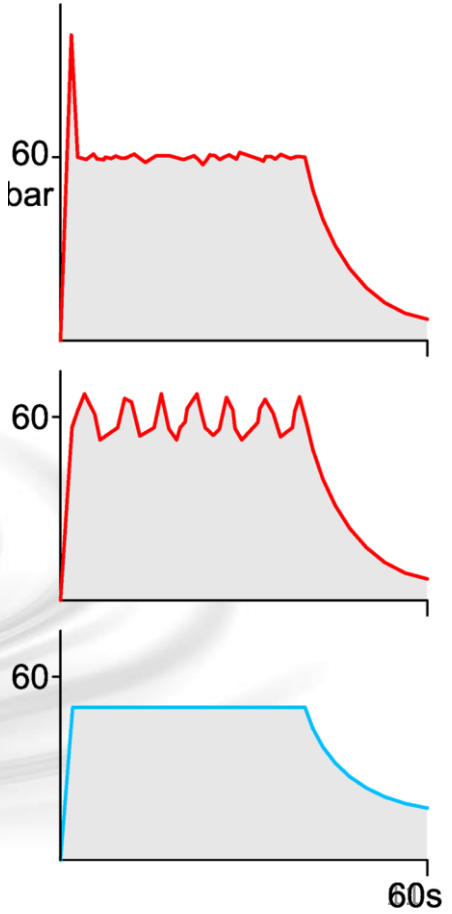
- Siex valve, model RD
  - Static equilibrium
    - Chambers not communicated
  - Pneumatic regulation via cartridge
    - Outlet pressure = Cartridge x factor
    - **HIGHER FLOW RATIO**
    - Pneumatic regulation, gas behaves always in the same way
    - No extra costs (calibration)
    - Eliminates drawbacks from restrictor systems





CONSTANT FLOW TECHNOLOGIES

- Competitor 1: Dynamic equilibrium
  - Low flow rate
  - Peak at 100 bar, then quite constant
  - Based on springs: each valve works different
- Competitor 2: Dynamic equilibrium
  - Upper chamber fills and empties → irregular
  - Spring performance not tested in a long run
  - Safety risks when closed pipe sections
- SIEX CFT™: Static equilibrium
  - Consistent and reliable pattern
  - Adjustable output pressure
  - Safety: outlet pressure never exceeds cartridge's

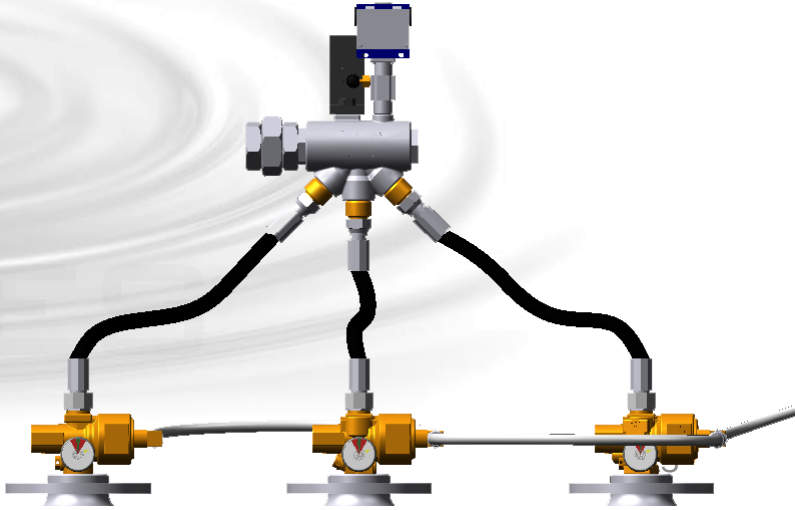


CONSTANT FLOW TECHNOLOGIES

	SIEX CFT	Competitor 1	Competitor 2
Equilibrium	- Static: no variations	- Dynamic: **peak** (100bar)	- Dynamic: huge variations
Eq. mech.	- Nitrogen cartridge - **Sealed** regulation chamber	- Mechanic: spring - Connected chambers	- Mechanic: spring - **Fluctuating** chambers
Discharge pressure	- **ANY.** Easily readjustable - Independent from storage; cyl. does not affect discharge equilibrium.	- **Fixed**: 300bar→ 60bar 200bar→ 40bar - Cylinder affects equilibrium	- **Fixed**: 300bar→ 60bar 200bar→ 40bar Cylinder affects equilibrium
Reliability	- **CONSISTENCY**, the only valve that warrants identical behavior	- Springs not calibrated - Each works DIFFERENT	- Springs not calibrated - Each works DIFFERENT
Safety	- **Stabilizes at 60bar** in case of blocked output	- No accidental discharges (cup off)	- Uncontrolled discharge if outlet is blocked: 300bar
	- Upper outlet - **Whole system approvals UL, FM** (hardw. & softw.)	- Side outlet	- Side outlet

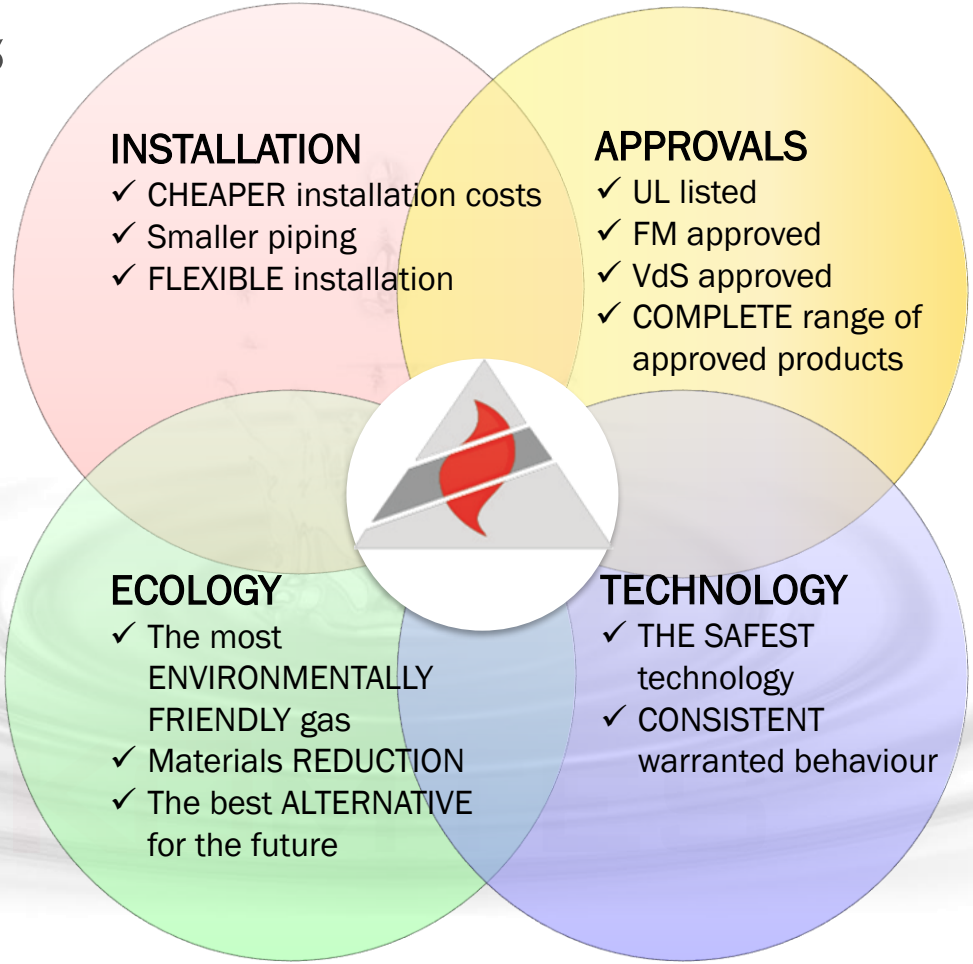
OTHER ADVANTAGES

- UL / FM approvals
  - Better systems behaviour: **Lower design concentrations: -5% to -10%**
  - Additional components also approved: safety, control, etc.
- Combi Manifold (CMS™)
  - Lighter, manageable
  - Pressure losses reduction
  - Meccano configuration: extreme flexibility
- Others
  - Upper valve output: Installation flexibility



CONCLUSIONS

Summary of advantages



QUESTIONS?

Thank you for your time