

GEN-RP Gas Consumption Estimates

- The volume of a **UVA XY GEM** module = 3.6 l
 - No of modules in a UVA XY layer = 4
 - Thus at 5 volume changes per an hour,
the consumption rate per UVA XY layer = $3.6 \text{ l} * 4 * 5/\text{hr} = 72 \text{ l/hr}$
- The volume of an **INFN XY** module = 2.4 l
 - No of modules in an INFN XY layer = 3
 - Thus at 5 volume changes per an hour,
the consumption rate per INFN XY layer = $2.4 \text{ l} * 3 * 5/\text{hr} = 36 \text{ l/hr}$
- Volume of gas in a **UHP Nitrogen bottle** (read off of a bottle we have)
= 304 cubic feet = **8608.32 l**
- Volume of gas in **75/25 premix Ar/CO2 bottle** (read off of a bottle we have)
= 349 cubic feet = **9882.58 l**
- In the fully loaded GEN_RP setup
 - 10 UVA XY layers = $72 \text{ l/hr} * 10 = 720 \text{ l/hr}$
 - 2 INFN XY layers = $36 \text{ l/hr} * 2 = 72 \text{ l/hr}$
 - Thus, total setup = $792 \text{ l/hr} = 19,008 \text{ l/day}$
 - Expected Nitrogen bottle usage rate = **2.2 bottles / day**
 - Expected premix Ar/CO2 bottle usage rate = **1.9 bottles / day (so 2)**
- The current EEL/125 setup
 - 8 UVA XY layers = $72 \text{ l/hr} * 8 = 576 \text{ l/hr} = 13,824 \text{ l/day}$
 - Expected Nitrogen bottle usage rate = **1.6 bottles / day**
 - But we've been running at about 2.5 volume changes per hour rate the past two weeks for our HV test. So according to this calculation, the expected bottle changing rate is = **0.8 bottles / day**
 - Expected premix Ar/CO2 bottle usage rate = **1.40 bottles / day**
 - Expected premix Ar/CO2 bottle usage rate with 2.5 volume changes per hour = **0.7 bottles / day**