



Airzone: ASHRAE 15 Compliance Made Easy

NAVIGATE NEW REFRIGERANT STANDARDS WITH CONFIDENCE

New Refrigerant Standards Are Here: **Are You Ready?**

As a mechanical engineer, you're facing significant changes with the transition to A2L refrigerants under ASHRAE Standards 15 and 34. Stricter safety regulations and lower refrigerant charge limits mean **conventional VRF systems designs may no longer comply.**

Why Switch to A2L Refrigerants?

The HVAC industry is transitioning to A2L refrigerants as a response to growing environmental concerns and stricter regulations. With lower global warming potential (GWP) and ozone depletion potential (ODP) compared to traditional A1 refrigerants, A2L options like **R-32** and **R-454B** align with global efforts to reduce carbon emissions and promote sustainability. However, as A2L refrigerants are considered 'mildly flammable,' stricter design limits and safety measures are required, presenting new challenges for HVAC professionals.

Refrigerant Concentration Limit (RCL)





A1
(R-410A)

OLD STANDARD

- GWP 2,088
- Toxicity A
- Flammability 1



A2L
(R-32)
(R-454B)

NEW STANDARD

- GWP 675
- Toxicity A
- Flammability 2L

Higher Stakes in Every Project



Delivering the same quality

You're now tasked with meeting strict new refrigerant limits while delivering the same high-quality HVAC applications your clients expect.



Balancing performance and safety

This means every installation must carefully balance performance and safety, ensuring that even in the event of a leak, refrigerant concentration stays within the set limits.



Increased complexity

Navigating these restrictions adds complexity to your designs and installations, increasing the risk of delays, compliance issues, and costly mistakes.

Airzone: Your Partner for Easy ASHRAE 15 Compliance

Airzone's advanced zoning systems for Inverter/VRF AHUs offer a smarter, more efficient way to navigate the challenges of new refrigerant regulations.



Optimized Applications Design

Airzone systems optimize the design of HVAC applications to match the building's **real demand**. This ensures only the necessary refrigerant is used, lowering the refrigerant charge.



Fewer Units, Less Piping

By enabling precise zoning, Airzone allows the same space to be air conditioned with fewer AC units. This reduces the amount of piping required, minimizing potential leakage points and installation complexity.

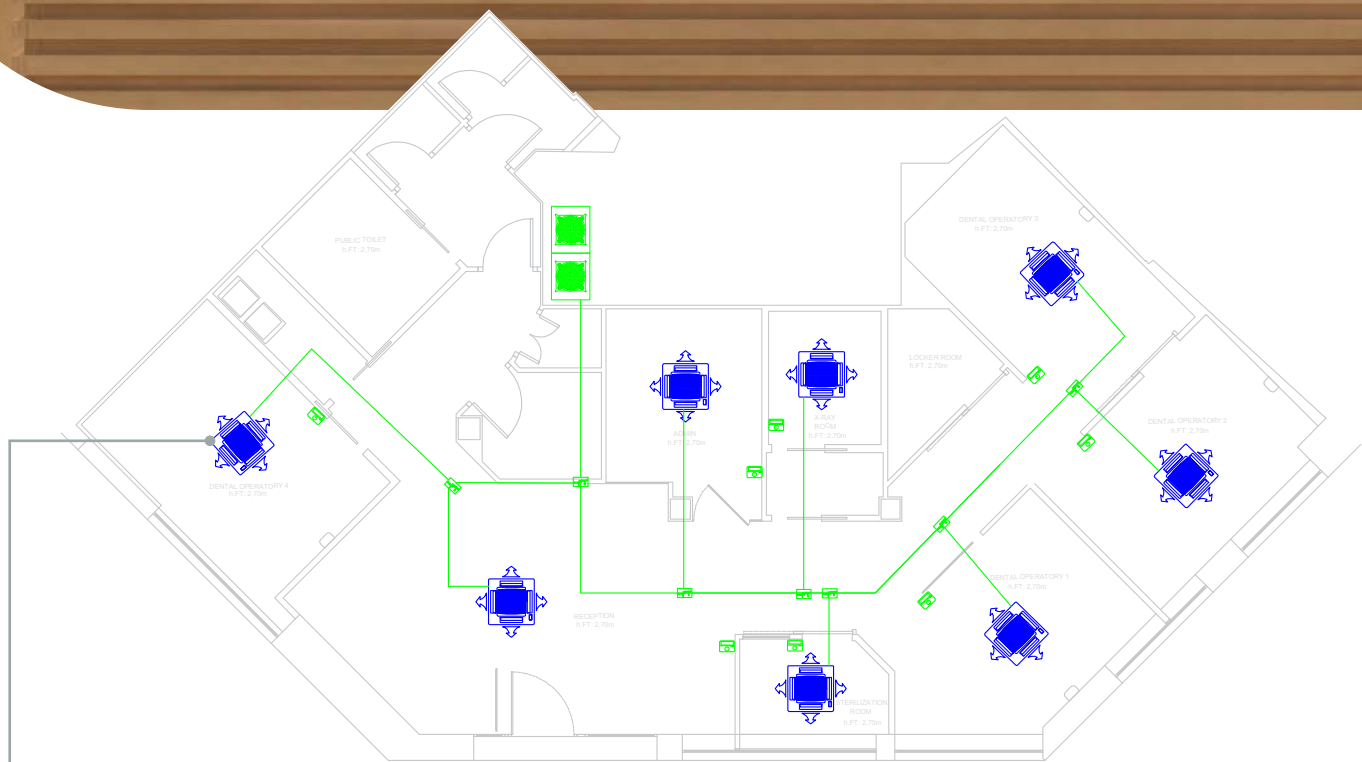


Reduced Refrigerant Concentration

Airzone's solution uses ducted units to air condition multiple zones from a single system. In the event of a refrigerant leak, the volume of the ceiling plenum is factored into the calculations for refrigerant concentration, effectively increasing the total volume considered. This, combined with the **lower refrigerant charge** of a zoned system, helps to ensure that refrigerant concentrations remain within the permitted limits under ASHRAE Standard 15.

CASE STUDY >> DENTAL CLINIC

Conventional VRF Installation VS Airzone's Advanced VRF Zoning Solution



CONVENTIONAL VRF INSTALLATION



8 cassette units



339.9 ft of piping



69,000 BTU/h
 > Outdoor Unit Capacity



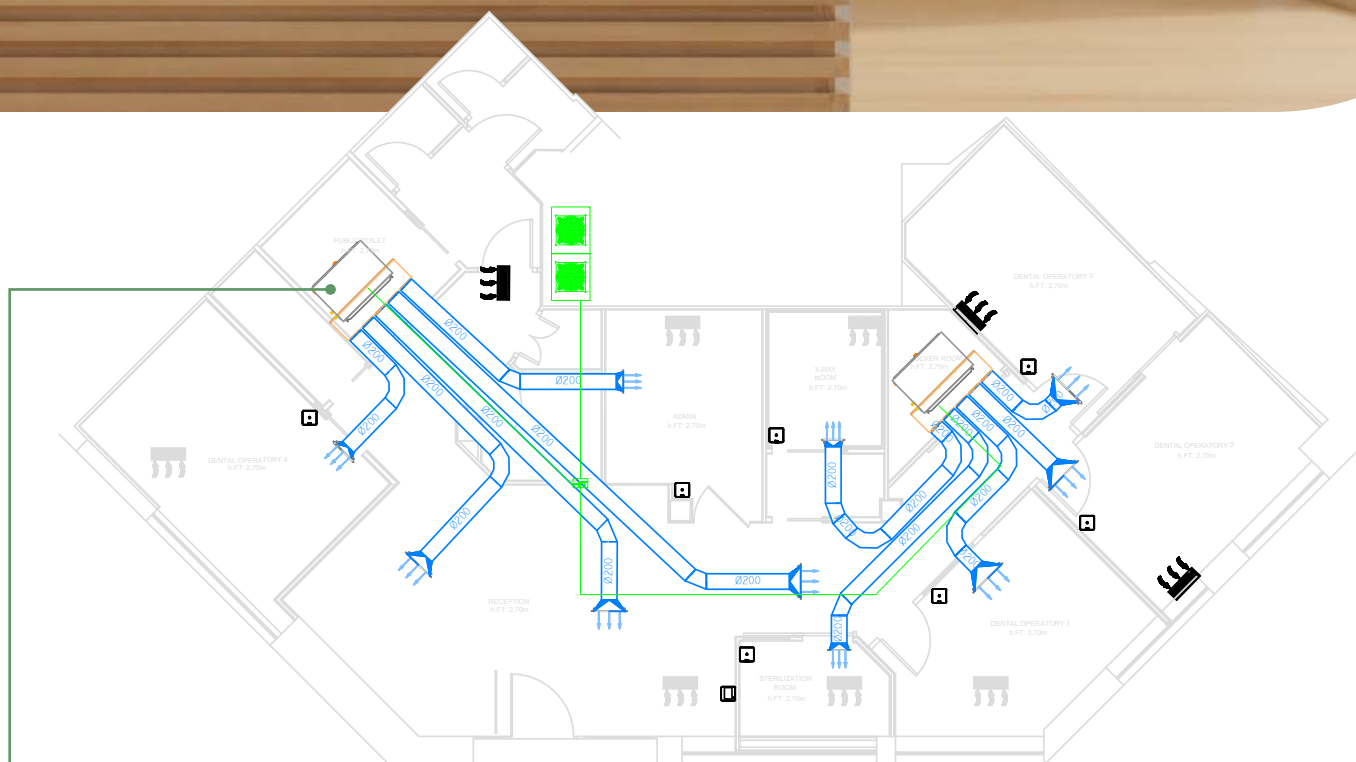
16.03 lbs of R-32



Required EDVC: 3,337.50 ft³
 > See Technical Appendix



Concentration in case of total leakage:
41'7 lbs/1000 ft³ > 4'8 lbs/1000 ft³



AIRZONE VRF ADVANCED ZONING SOLUTION



2 Ducted Units
 > With Airzone's Zoning Solution



221.1 ft of piping



52,000 BTU/h
 > Outdoor Unit Capacity



10.29 lbs of R-32



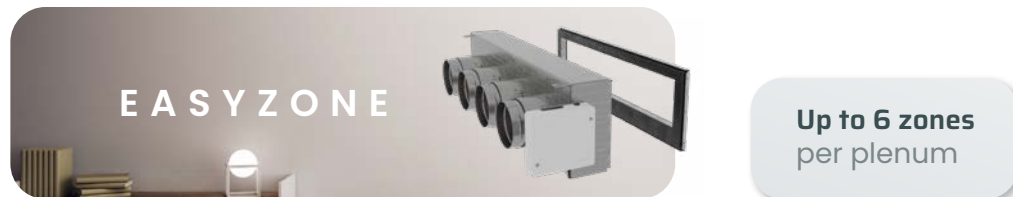
Required EDVC: 2,143.49 ft³
 > See Technical Appendix



Concentration in case of total leakage:
2 lbs/1000 ft³ < 4'8 lbs/1000 ft³

Airzone Zoning Solutions

Airzone solutions integrate seamlessly with leading Inverter/VRF HVAC units, dynamically adjusting temperature and fan speed of the Air Handling Unit (AHU) to match real-time installation demands. Each Airzone zoning control solution uses a dedicated communication gateway to control the HVAC unit according to its manufacturer's communication protocols, allowing for enhanced system efficiency and comfort while eliminating the need for bypass dampers or pressure sensors.



Plug & Play Zoning for Ducted AHUs

The Easyzone Plug & Play zoning solution is an all-in-one plenum box specifically designed to adapt to **ducted horizontal, multi-position, and vertical AHUs**, offering an efficient and flexible approach to HVAC management. Pre-wired and ready to install, the system simplifies setup, reduces the risk of installation errors, and helps prevent delays and unnecessary labor costs. With features like dynamic fan speed adjustments and real-time temperature control, Easyzone enhances comfort in every zone while optimizing energy efficiency.



Loose Damper Zoning Solution for Vertical, Horizontal, and Multi-Position AHUs

Airzone's VAF provides efficient control for **hybrid ducted and ductless HVAC units**, offering a flexible solution for zoned temperature management. The system integrates air conditioning with **zone-specific supplemental heating control**, delivering enhanced comfort and energy efficiency. Designed for seamless integration with major Inverter/VRF manufacturers, Airzone VAF ensures compatibility with a wide range of HVAC configurations, simplifying both installation and operation.

Why Professionals Choose Airzone

Simplified installation:

Fewer units, pre-wired systems, and shorter piping mean faster installs with less complexity.



Lower labor costs:

Pre-wired components and reduced piping translate to less time on-site, saving both effort and expenses.



Customer satisfaction:

Deliver projects that exceed energy efficiency and comfort expectations while ensuring full compliance with industry standards.



Getting Started with Airzone



Contact Our Sales Account Manager

Contact our sales team to find the sales contact in your area and answer any general questions you may have. >>



azna-staff@airzonecontrol.com



Send Us Your Plans or Use Ductzone

Provide us with your project plans, and we will help you design a tailored HVAC solution that meets your specific needs. Alternatively, use our Ductzone tool to create an HVAC project starting with a plan in just 10 minutes. >>



projects_na@airzonecontrol.com



Check Your HVAC Unit's Compatibility

Enter your HVAC system's brand and model number to check its compatibility with our Airzone zoning solutions! Don't see your model number? Please reach out! >>



Learn with Airzone Academy



<< Access our unique library of product trainings, installation trainings, trending topic webinars, and more!

training_na@airzoncontrol.com

Watch Our Installation Videos



<< Prepare your installation by watching our step-by-step comprehensive video tutorials.

Tech Support Service



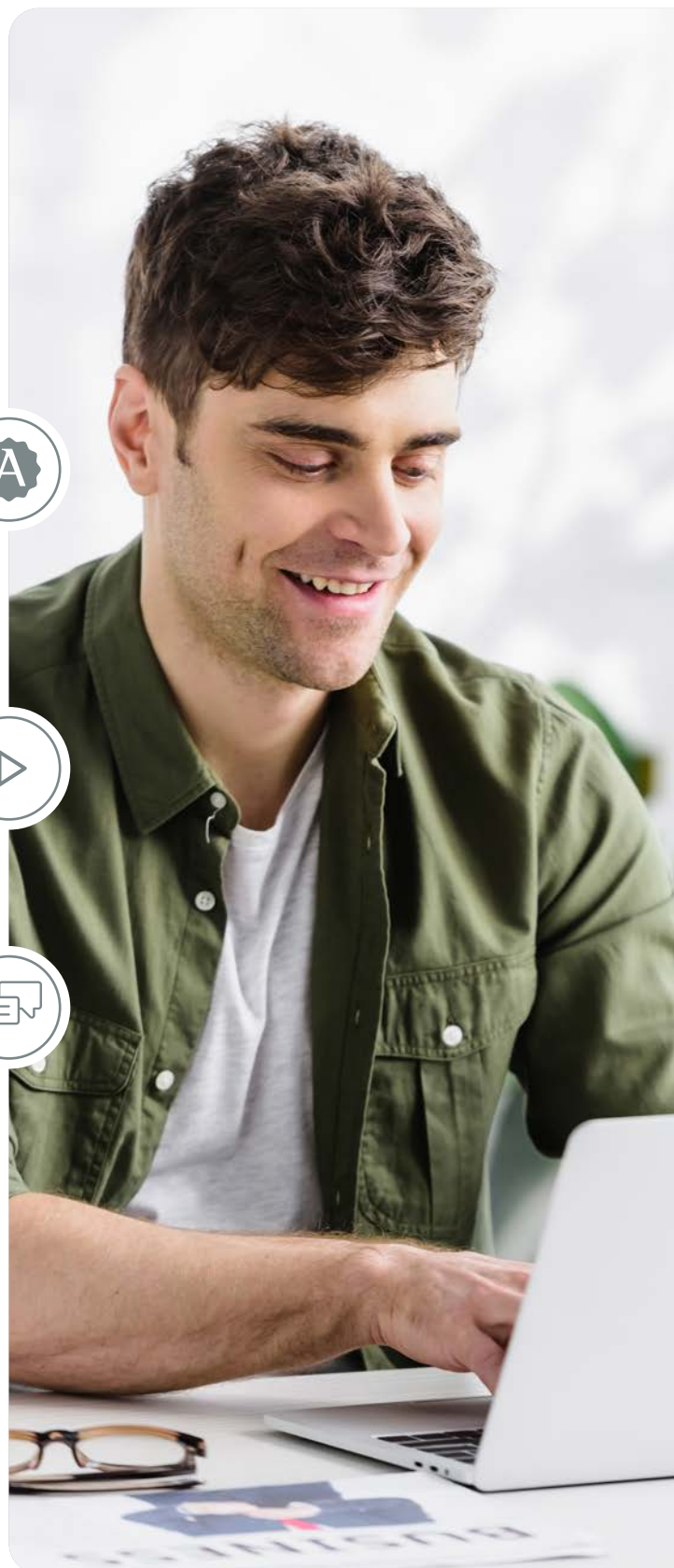
<< For any doubts or technical questions, our tech support team is here to help, pre-installation to post-installation!

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We are here to help you every step of the way.
Please do not hesitate to reach out

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Technical Appendix

DENTAL CLINIC CASE STUDY

This case study analyzes a dental clinic's HVAC system, comparing two design approaches: a conventional VRF installation with individual cassette units and the Airzone advanced VRF zoning solution. The analysis focuses on achieving ASHRAE 15 compliance for A2L refrigerant concentration limits, such as R-32.



Conventional VRF vs Airzone VRF

CONVENTIONAL VRF INSTALLATION

8 Zones

8 Individual Ceiling Cassette Units

> 1 indoor unit per zone

Zone	Area (ft ²)	Volume (ft ³)	Indoor unit
Reception	446.27	3,953.20	15K BTU/h cassette
Dental Operatory 1	130.67	1,157.55	7.5K BTU/h cassette
Dental Operatory 2	129.17	1,144.20	7.5K BTU/h cassette
Dental Operatory 3	127.01	1,125.13	7.5K BTU/h cassette
Dental Operatory 4	138.10	1,223.34	9K BTU/h cassette
Sterilization Room	44.13	390.93	7.5K BTU/h cassette
X-ray Room	43.38	384.26	7.5K BTU/h cassette
Admin	85.36	756.12	9K BTU/h cassette

- **Total area:** 1,144.09 ft²
- **Total volume:** 10,134.72 ft³
- **Refrigerant load:** 16.03 lbs of R-32
- **Piping length:** 339.9 ft
- **Total Capacity for All Indoor Units without Airzone Solution:** 70,500 BTU/h



AIRZONE ADVANCED VRF ZONING SOLUTION

2 Ducted AC unit

2 Easyzone plenum

› with 5 dampers, adding independent temperature control per zone

Zone	Total area (ft ²)	Volume (ft ³)	Indoor unit
Reception, Admin, Dental Operator 4	$446.27 + 85.36 + 138.10$ = 669.73	$3,953.20 + 756.12 + 1,223.34 =$ 5,932.66	30K BTU/h
Dental Operator 1, Dental Operator 2, Dental Operator 3, Sterilization Room, X-ray Room	$130.67 + 129.17 + 127.01 +$ $44.13 + 43.38$ = 474.36	$1,157.55 + 1,144.20 + 1,125.13 +$ $390.93 + 384.26 =$ 4,202.07	30K BTU/h

- **Total volume of the zones (without false ceiling):** 1,0134.72 ft³
- **Volume of false ceiling (AC unit serving Reception, Admin and DO4):** 602.35 ft³
- **Volume of false ceiling (AC unit serving the rest of the zones):** 943.43 ft³
- **Adjusted total volume (with false ceiling):** 11,680.50 ft³
- **Refrigerant load:** 10.29 lbs of R-32
- **Piping length:** 221.1 ft
- **Total Capacity for All Indoor Units with Airzone Solution:** 60,000 BTU/h



~25% reduction of the outdoor unit's capacity

› in comparison with the conventional VRF installation

~15% reduction of the total capacity of all indoor units

› in comparison with the conventional VRF installation

Total Leakage Simulation in the Smallest Zone

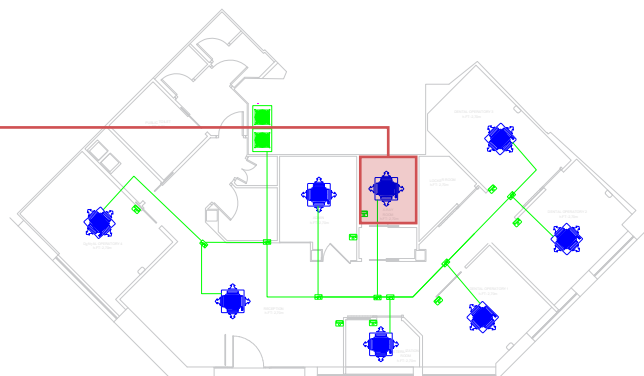


ASHRAE 15 R-32 CONCENTRATION LIMIT:
4.8 lb/1000 ft³

CONVENTIONAL VRF INSTALLATION

- **Smallest zone volume:**
X-Ray Room
384.26 ft³
- **Refrigerant concentration in case of total leakage:**

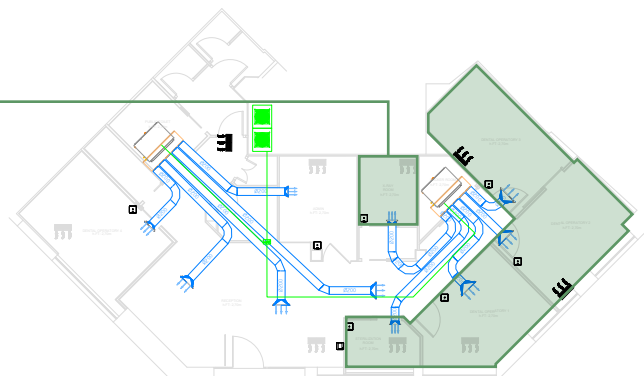
$$16.03 \text{ lbs} / 384.26 \text{ ft}^3 = \mathbf{0.0417 \text{ lbs/ft}^3}$$



AIRZONE VRF ADVANCED ZONING SOLUTION

- **Smallest zone volume:**
(Dental Operator 1, Dental Operator 2, Dental Operator 3, Sterilization Room, and X-ray Room)
5,145.49 ft³
- **Refrigerant concentration in case of total leakage:**

$$10.29 \text{ lbs} / 5,145.49 \text{ ft}^3 = \mathbf{0.0020 \text{ lbs/ft}^3}$$



Effective Dispersal Volume Charge

CONVENTIONAL VRF INSTALLATION

- **EDVC:** $16.02 / 0.0048 = 3,337.50 \text{ ft}^3$

Zone	Volume of zone (ft ³)	Required EDVC (ft ³)	ASHRAE compliant
Reception	3,953.20 ft ³	3,337.50 ft ³	✓
Dental Operatory 1	1,157.55 ft ³	3,337.50 ft ³	✗
Dental Operatory 2	1,144.20 ft ³	3,337.50 ft ³	✗
Dental Operatory 3	1,125.13 ft ³	3,337.50 ft ³	✗
Dental Operatory 4	1,223.34 ft ³	3,337.50 ft ³	✗
Sterilization Room	390.93 ft ³	3,337.50 ft ³	✗
X-ray Room	384.26 ft ³	3,337.50 ft ³	✗
Admin	756.12 ft ³	3,337.50 ft ³	✗

AIRZONE ADVANCED VRF ZONING SOLUTION

- **EDVC:** $10.29 / 0.0048 = 2,143.75 \text{ ft}^3$

AC Unit	Volume of zones (ft³)	Volume of false ceiling (ft³)	Total volume (ft³)	Required EDVC (ft³)	ASHRAE compliant
AC Unit 1					
<ul style="list-style-type: none">• Reception• Admin• Dental Operator 4	<div>Total: 5932.66 ft³</div> <div>3,953.20 ft³</div> <div>756.12 ft³</div> <div>1,223.34ft³</div>	602.35 ft³	6,535.00 ft³	2,143.75 ft³	<div>✓</div>
AC Unit 2					
<ul style="list-style-type: none">• Dental Operator 1• Dental Operator 2• Dental Operator 3• Sterilization Room• X-ray Room	<div>Total: 4202.06 ft³</div> <div>1,157.55 ft³</div> <div>1,144.20 ft³</div> <div>1,125.13 ft³</div> <div>390.93 ft³</div> <div>384.26 ft³</div>	943.43 ft³	5,145.49 ft³	2,143.75 ft³	<div>✓</div>

CONCLUSION

In the **conventional VRF installation**, if a leak occurred in the X-ray Room, Sterilization Room, Admin Room, or any of the Dental Operators, the ASHRAE 15 standard requirements would not be met. In the case of **Airzone VRF advanced zoning solution**, both subsystems comply with the ASHRAE 15 standard.



Contact Airzone

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