

AHU RESTORATION





Presenter



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Disclaimer

This presentation is not intended to be a comprehensive program covering all aspects of this topic. All technicians are encouraged to read and follow all applicable standards, codes and regulations related to this topic.

- ✓ It is the responsibility of each individual contractor to follow local building codes and licensing requirements and to work safely in accordance with OSHA guidelines.
- ✓ It is the contractor's responsibility to take proper precautions on each project to prevent cross contamination. Always take the health and safety of the building occupants into consideration before you conduct any cleaning procedures.
- ✓ All of the following tips are only general tips. They do not cover every situation and it is your responsibility to adapt these tips to the individual system you are working on.
- ✓ The Instructor is not responsible in any way for the work you perform after viewing this slide show. You are responsible for your own work.
- ✓ The views and opinions following are the instructors' opinions and not necessarily the official position of the National Air Duct Cleaners Association.



What We'll
Learn

Why Restoration

When to Restore

How to Restore



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Why Do We Restore AHUs and RTUs?

- Deterioration and/or contamination creates Indoor Air Quality problems for areas served.
- *examples:*
 - deteriorating insulation
 - rusting steel
 - mold
 - smoke odor



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WHY NOT JUST REPLACE AHU/RTU?

- A cost/benefit analysis needs to be done.
- Replacement unit may not be available (supply chain).
- New system design for future is necessary.
- There may not be capital funds available to replace a unit. They may need to buy time to capitalize the project.



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What is the proper way to perform this service?

- That depends upon whom you ask.
- There is no concrete answer to this question.



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The Disclaimers

- There are no cognizant authorities that recommend or instruct in this practice.
- There are no industry standards instructing in this practice.
- There are no recognized professional protocols for this practice.
- There is no authority who can inspect and approve of your work in this practice.
- You and your customer are on your own and are at “your own risk” when you enter into this practice.



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The Disclaimers Continued

- There are no materials guides or manufacturer specifications that can guide you how to do this properly.
- There are no published methods to follow when engaging in this practice.
 - *FOR EXAMPLE:* Spray coatings (which the insulation manufacturers repudiate) have more concrete support for that practice, than stripping and relining of AHUs-RTUs has.



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The Disclaimers Continued

- HVAC unit manufacturers will not support this practice, they will not provide you with materials specifications or guidance on what kinds of materials can be used where.
- They don't want contractors like us doing this; they want people to solve the problem by buying new units.
- There is an unanswered question (at least to my knowledge) about this practice....



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The Disclaimers Continued

- These air handling units are tested and listed (Underwriter's Labs or equivalent) as they are when they are sent out of the factory.
- Technically, when restoration of AHUs is performed, the appliance is no longer as it was when it was manufactured. Restoration with non-standard repair parts or materials changes the machine.
- By a strict interpretation, these units are no longer listed.



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Another unanswered question regarding internal insulation, SMACNA offers NO guidance on this matter.

- Their realm is exclusively ductwork. They do not cross into air handling units at all.
- Their prescribed material is fiberglass duct liner. They don't have anything to say one way or another about how alternate materials like self-adhesive elastomeric foam should be used in ductwork, let alone how it should be used inside of air handling units.



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And another potential booby-trap! R22 Systems

- The R22 ban is in full effect and has been for several years.
- EPA's express intent in the full ban is that it is currently illegal to repair R22 refrigerant circuits.
- What happens if an R22 coil springs a leak while you are restoring an AHU/RTU?



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Does that mean that the practice of restoration shouldn't be performed?

- That is a question for you and your customer to answer.



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The Moral of the Story...

- Ultimately, it is going to be a cost/benefit analysis by the property owner determining what the best course of action is and what risks should be taken.
- We should not tell the customer what risks they ought to take.
- Similarly, the customers can't tell us what risks we must take on their behalf.
- Put the information on the table and "partner the risk." Choose a course of action together.



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CAUTION!

- If you go down this path, choose your materials wisely.
- *Example:* Don't use elastomeric foam to reinsulate the heat exchanger compartment of a fuel fired furnace.



A Problem: Deteriorating Insulation





A Problem: Deteriorating Insulation

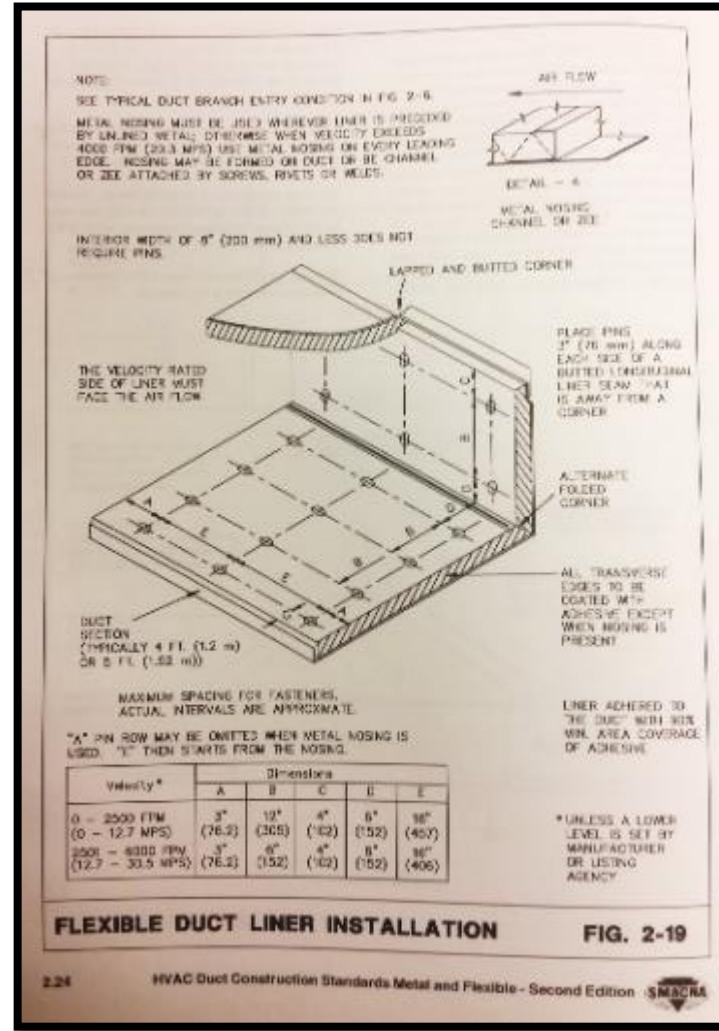




A Problem: Deteriorating Insulation



A Problem: Deteriorating Insulation





Another Problem: Wet Insulation



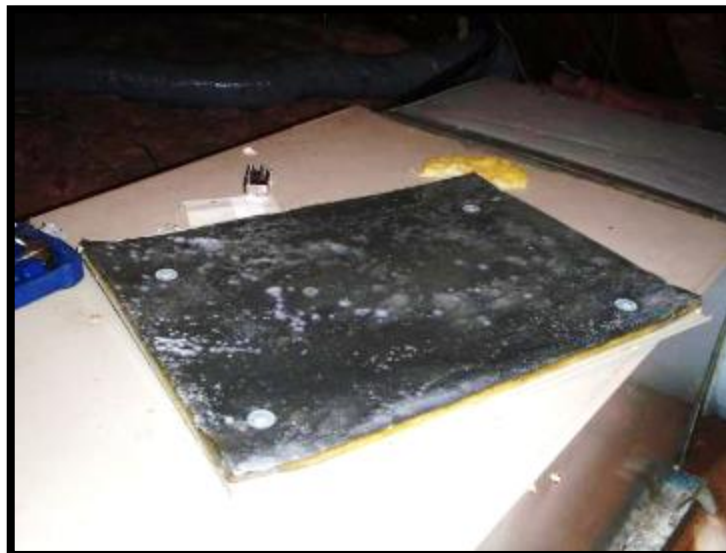


Another Problem: Wet Insulation





And Another Problem: Mold





And Another Problem: Mold



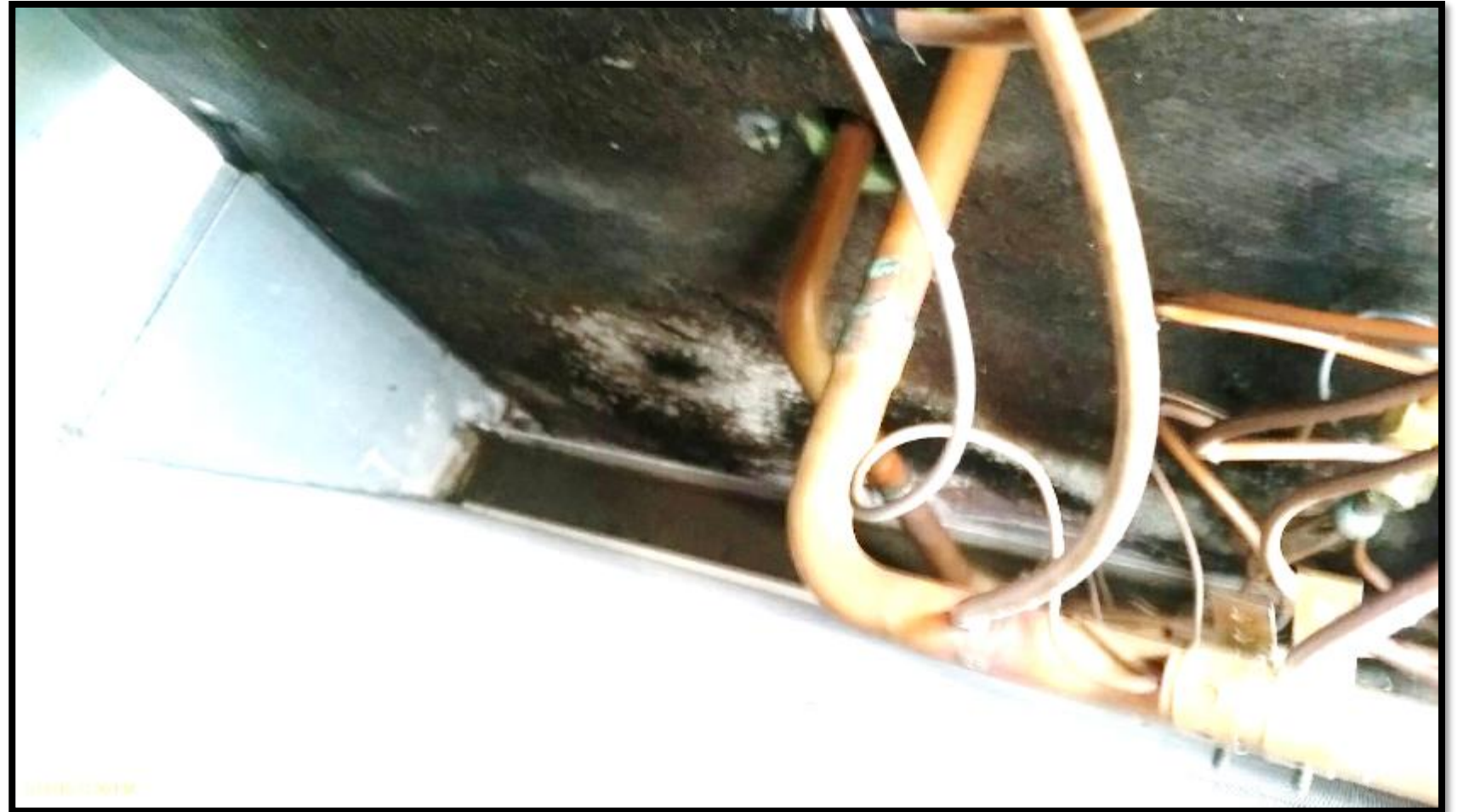


And Another Problem: Mold





And Another Problem: Mold





More Problems: Rusting Steel





More Problems: Rusting Steel

- Rust is a special problem in HVAC systems. It defies cleaning because it keeps coming back releasing loose particles to the air stream.
- This is because rust begets rust. Once steel has rusted, the iron oxide accelerates the rusting of the steel it is resting on.
- Steel rusts when exposed to oxygen under ideal conditions like exposure to dampness and heat. Once rust has started, the existing rust plus the exposure that first caused the rust, work together to increase rust production.
- You really need to stop the rust process somehow, cleaning loose rust flakes is only short term.
- Enter a product called rust converter.



More Problems: Rusting Steel

- Rust Converter was developed by the space program to preserve the reusable launch platforms used in the Space Shuttle Program.
- Like much good new tech developed by NASA, it eventually trickled down to the general public.
- There are numerous brands of the product, now, but it is all basically the same tech.
- Rust converter chemically changes iron oxide to another inert substance to stop the rust domino effect. The inert substance is embedded in polymer that hardens.
- This is not a force field that absolutely prevents rust from occurring on surfaces it is applied to. If the conditions that led to the rust initially remain, then rust will eventually come back just like on normal painted steel exposed to moisture and heat.
- Flakey rust must be manually removed first so that rust converter is applied to base layer of rust on the steel.
- Rust converter does not add material. If too much steel has rusted away such that the component can no longer do its job, rust converter is of no use.



More Problems: Leaking Condensate Drain Pan

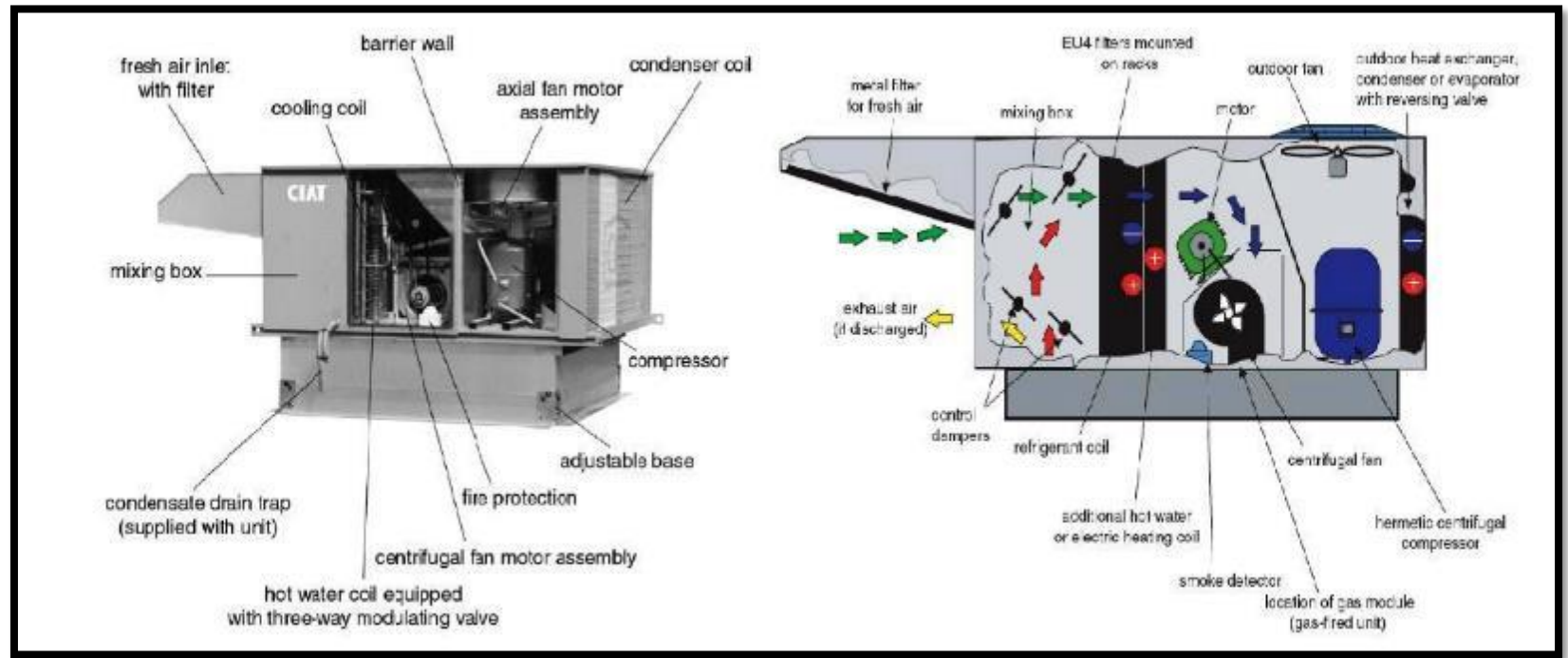




More Problems: Leaking Condensate Drain Pan

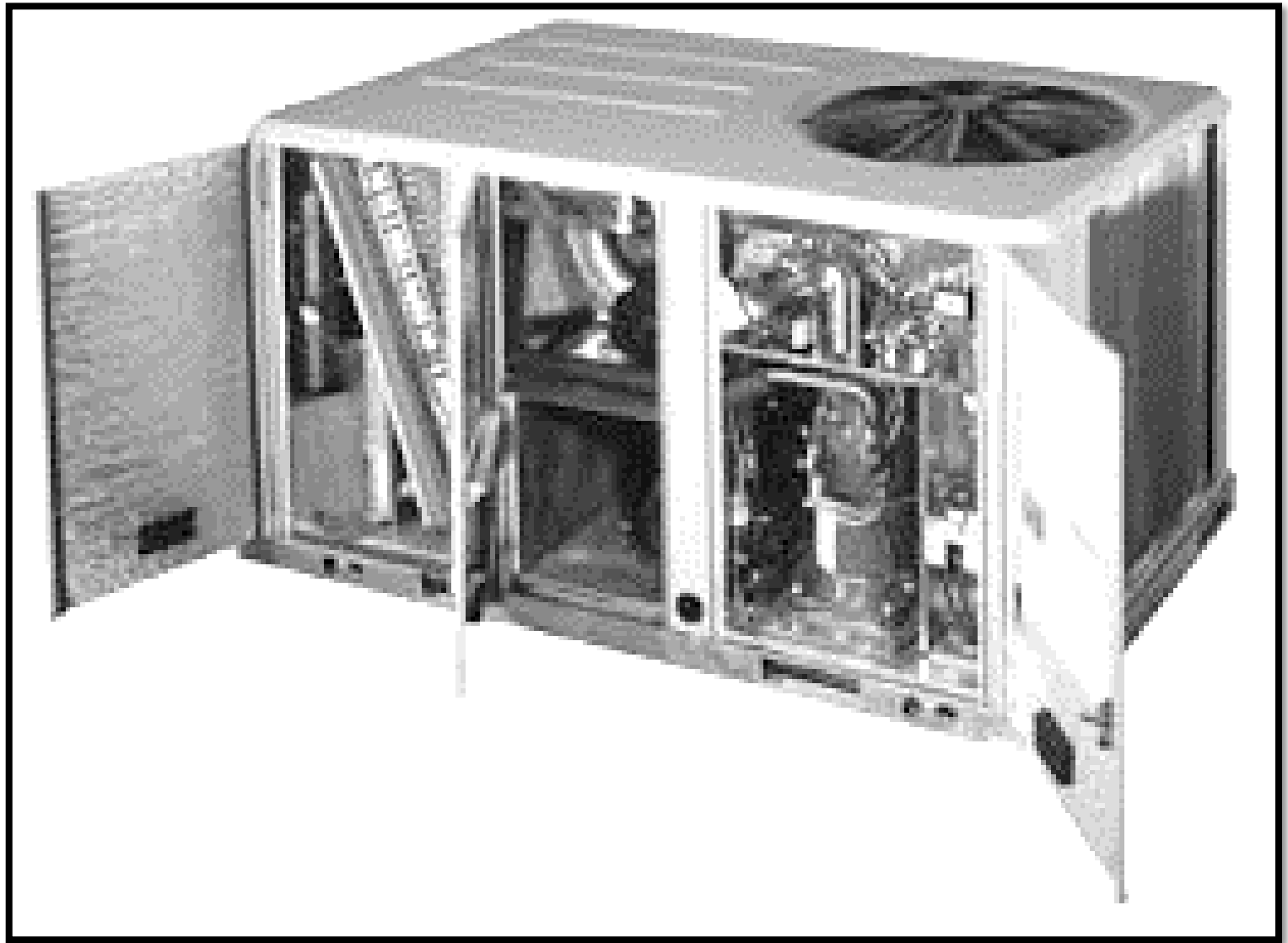
- If a steel condensate drain pan has rusted through, then rust converter will not make a successful repair.
- One of the various products available through associate members is appropriate for condensate pan restoration.
- These are plastics products that use what is left of the original pan as a form to pour the product into.
- Once the product is set, it is the new pan.

How AHUs Are Assembled



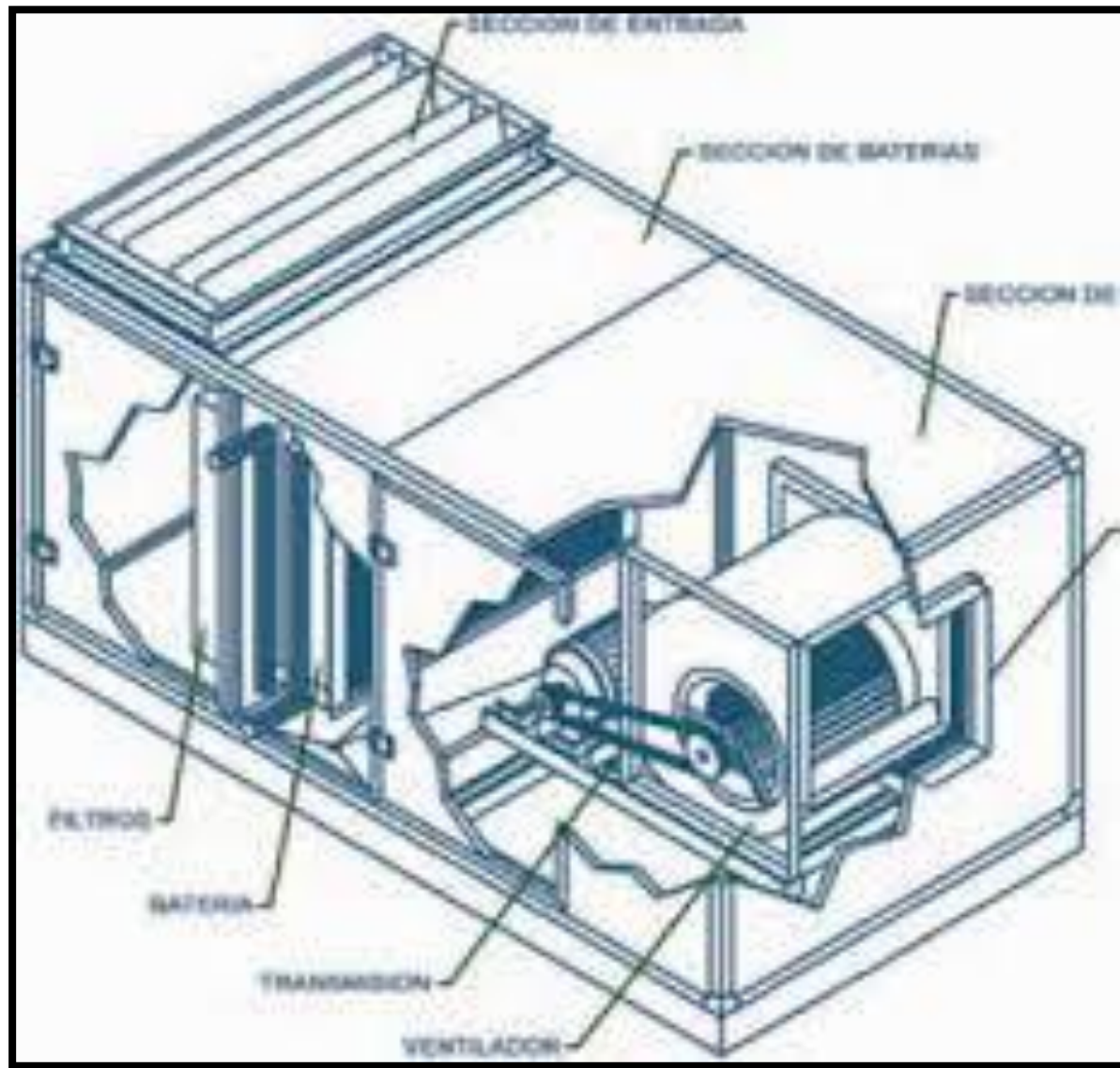


How AHUs Are Assembled





How AHUs Are Assembled





How AHUs Are Assembled





How AHUs Are Disassembled





How AHUs Are Disassembled



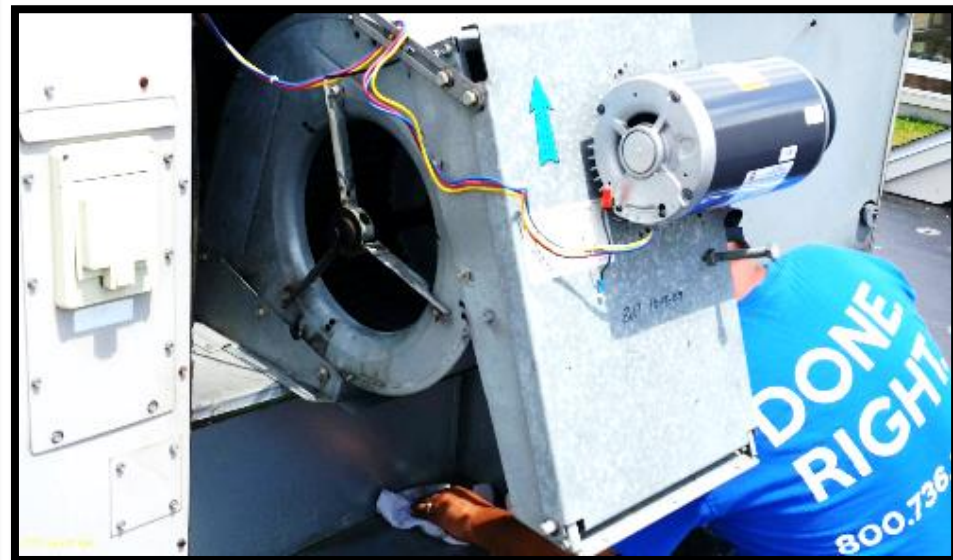


How AHUs Are Disassembled





How AHUs Are Disassembled





Removing Old Insulation





Installing Elastomeric Foam Insulation



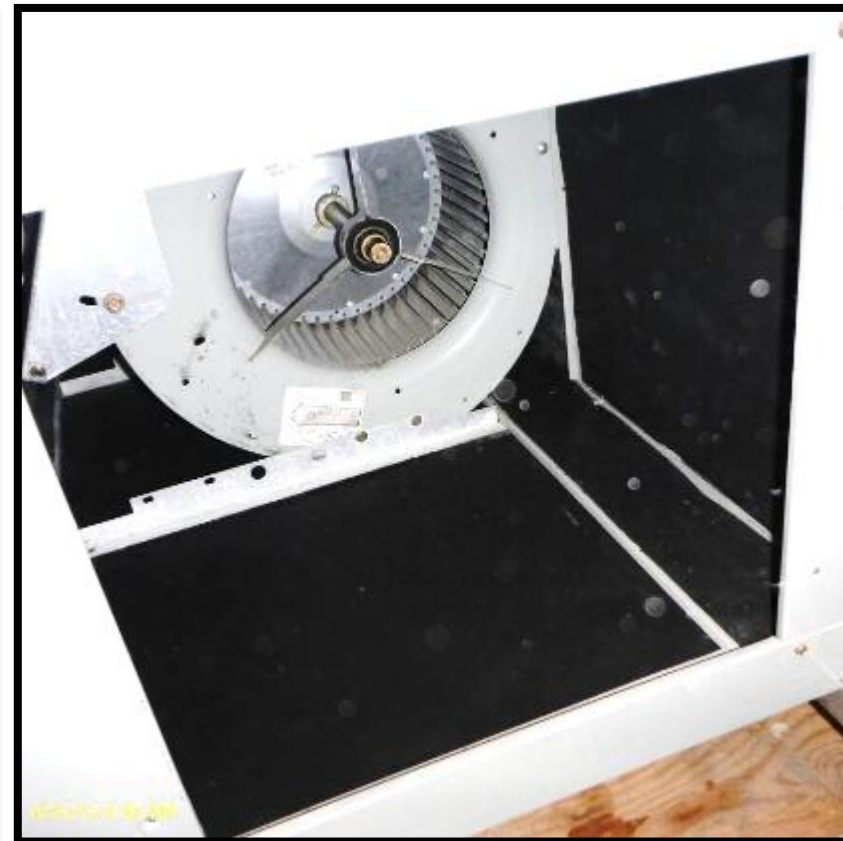


Installing Elastomeric Foam Insulation





Installing Elastomeric Foam Insulation





Installing Elastomeric Foam Insulation





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Conclusion

- Identify cause of deterioration/contamination and correct.
- Disassemble unit enough to gain access.
- Perform appropriate remediation.
- Reassemble unit.



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Thank you
for
Participating!

