TRANE: Improve Air Quality & Efficiency

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FAMU-FSU Engineering

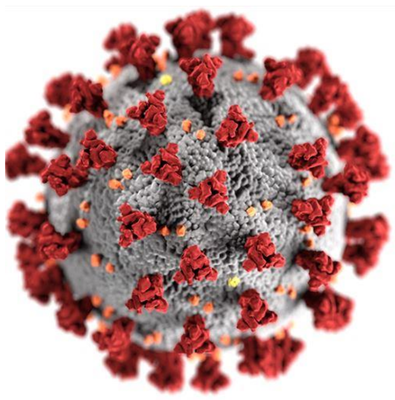
TRANE

FAMU-FSU College of Engineering

Background:

The COVID-19 pandemic has made indoor air quality a primary concern for businesses, schools, and individuals. It is an economic concern and an issue of public health and safety.

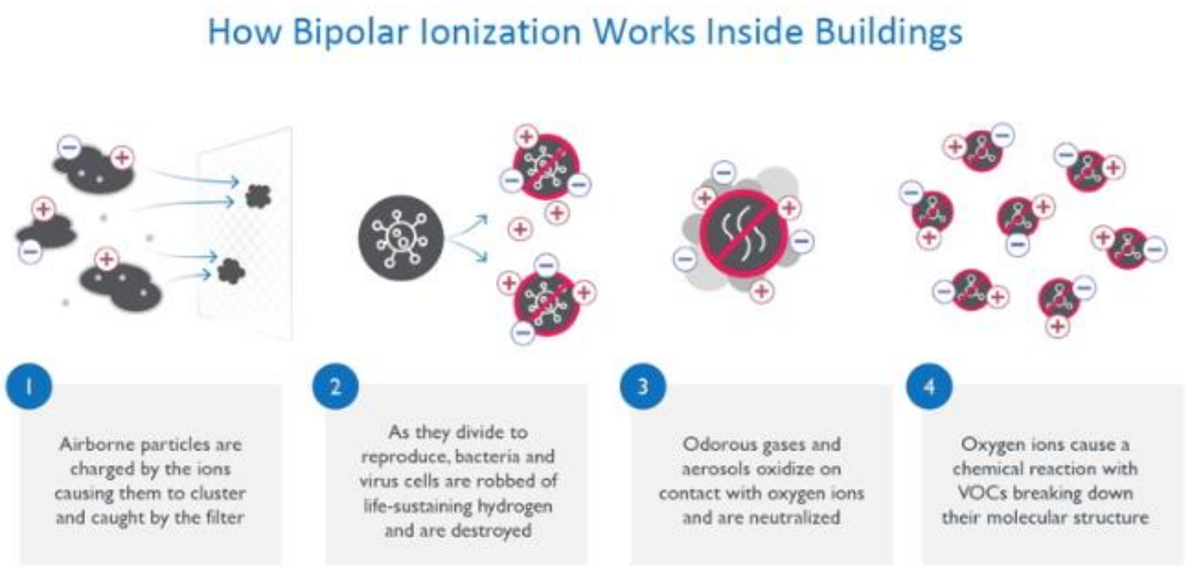
We aim to allow people to return to school and/or work in a safe and responsible way.



Objective:

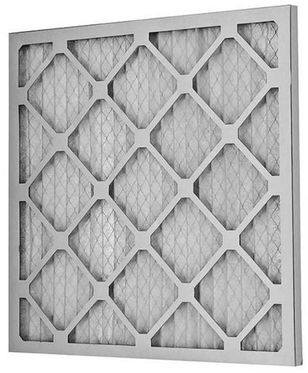
Develop a strategy to improve indoor air quality that combats COVID and has significant long-term usefulness.

The system should fit existing HVAC infrastructure and adhere to government and environmental guidelines.



GPS FC-48 Needle Point Bipolar Ionizer

A module like this is installed in the air handler. There is produces ions that serve to filter the air of particulate and combat organic molecules in the air stream.



Ionization makes particulate in the air easier to filter but doesn't actively filter it. Filters are still required to clean the air.

The recommended filter rating depends on the system.

Goals:

The solution must improve air quality and reduce the threat of COVID-19 in buildings. A key goal is to select and introduce a solution that will adhere to the wishes of FSU facilities, our sponsor TRANE, and Senior Design Professor, Dr. McConomy.

The system must be designed to retrofit existing HVAC systems for ease of installation and remain useful to indoor air quality after the threat of COVID-19 no longer exists.

Solution:

Needle Point Bipolar ionization (NPBI) was selected as a viable solution to improve air quality due to its effectiveness against harmful aerosols, little to no maintenance requirements, and lack of ozone generation.

This technology uses electric voltage to create a high concentration of positively and negatively charged ions in the air. These particles clump together and become easier to filter, as well as denature organic molecules in the air. Organic molecules include mold, bacteria, and viruses.