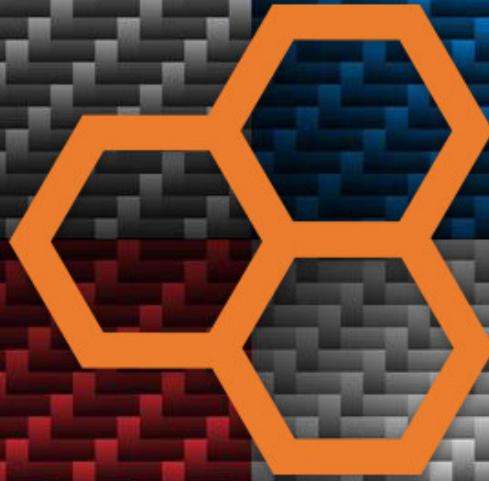


**COMPOSITE ENVISIONS KNOWLEDGE HUB
PRACTICAL AND INSIGHTFUL COMPOSITES INFORMATION**



BEST PRACTICES WHEN USING RESINS INDOORS



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INTRODUCTION

Nearly every resin used in composites gives off some sort of smell / odor when mixed and as it is cured. How mild or powerfully noticeable a given resin is dependent on several factors. The type of resin, its chemistry, Volatile Content (VOC), and the physical amount being used are all factors that determine how mild or powerful a resin's odor may be. The space in which the resin is being applied paired with the airflow are all factors of ventilation, helping ease the smell and/or hazards of a given resin. We will cover some types of commonly used resins in their regard to our body's' safety and provide some best practices to ensure the utmost safety in a project.

Always reference the respective resin's safety data sheet BEFORE USE. This will give a great indication of any hazards or dangerous concentration levels with any resin system. It may also speak to what type of ventilation may be needed for a defined space.

SENSITIZATION

Not everyone has the same tolerance to resin vapors. While some may have no issue with repeatedly using a specific resin, some even single exposures can cause allergic reactions. Some people may also suddenly become sensitive to a resin due to repeated exposure. What is important to know is that resins may affect everyone differently. Resin sensitivity is not a one all effect on one person.

EPOXY RESINS

As resins are mixed and cured, an exothermic reaction occurs. This reaction causes resins to outgas, the vapors released are what our noses smell. Resin hardeners are the usual culprit may for giving a specific smell. Generally, epoxies have a weak smell but vary dependent on type. Epoxy resins tend to have a low Volatile Content (VOC) and thus are low on the scale of vapors being released. However, some cheaper, fast-cure, "5-min" epoxies will give a stronger smell during cure as they will set faster. Epoxy resins are the safest of the resin types regarding harmful vapors. Epoxy is safe to use indoors, in most home areas or garage type application. If using in larger quantities, use of additional ventilation tools may be needed. Most often a fan will suffice for any given epoxy. If repeatedly exposed to concentrated amounts, epoxies can cause itching and swelling. Although rare, if this itching and swelling persists for more than a couple days, see a doctor!

POLYESTER & VINYLESTER RESINS

Caution should be used when using polyester & vinylester resins, especially if working indoors or smaller spaces. These resins have a higher volatile content and carry a strong

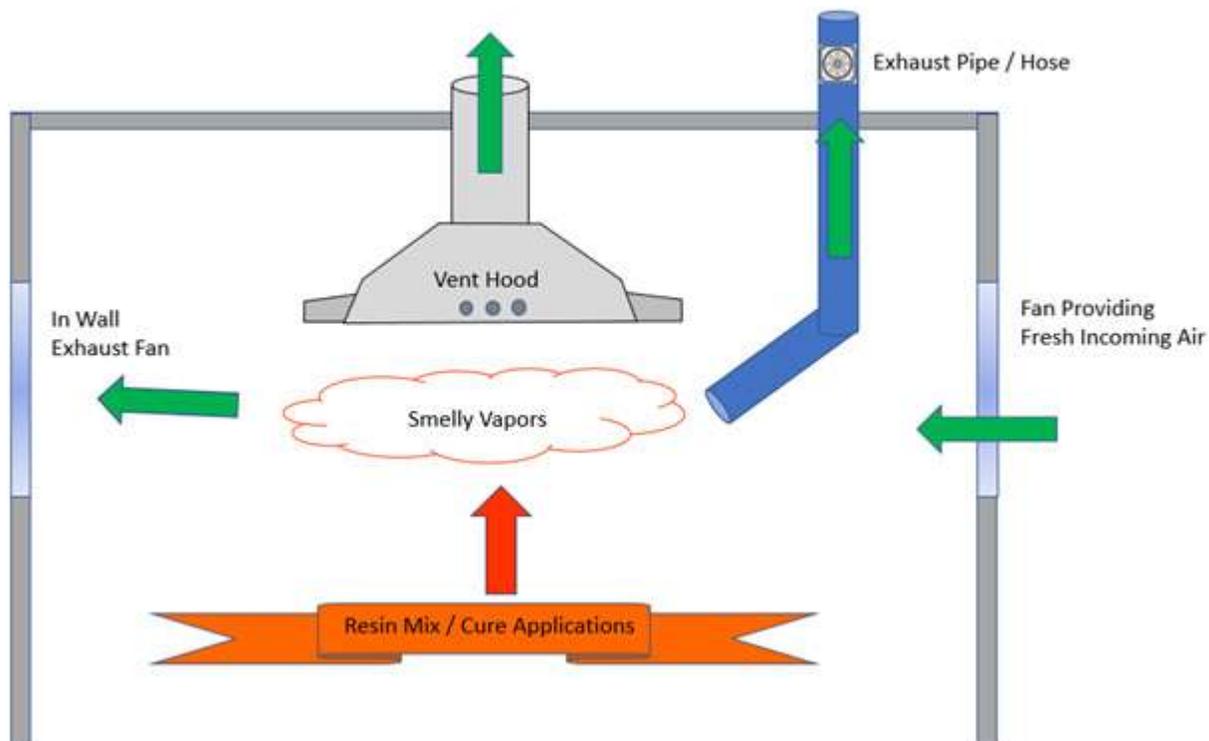


USING RESINS INDOORS

odor during mix and cure processes. Polyester & Vinylester Resins present a hazard due to Styrene. If inhaled in concentrated quantities it can irritate the respiratory tract. It is important to know that the smell of the resin is not necessarily harmful, mainly repeated and / or concentrated exposure. It is not suggested to use these types of resins inside a home or living space. A garage may suffice with proper ventilation. While these resins may require indoor controlled cures, proper PPE and ventilation practices should always be used. These types of resin may take days if not weeks to fully cure, in which an air space should always be kept well ventilated.

POLYURETHANE RESINS

Polyurethane resins should be treated similarly to that of polyester or vinylester resins. Polyurethane resins can cause respiratory issues due to isocyanates within the resin. Polyurethane resins outgas during their cure and those vapors can be harmful in high concentrations. However, a proper respirator, good ventilation, and following the below best practices will provide a safe working environment for application and cure processes. Most polyurethanes are used for coating and will leave a strong smell in non-ventilated areas. While it is often applied inside homes, it is not suggested to be inside the area during the cure. Garage application or an outdoor settings is best for this application.





USING RESINS INDOORS

BEST PRACTICES

PPE: If mixing / applying Polyester or Vinylester Resins in larger quantities, (greater than a couple cups) an organic vapor cartridge respirator should be used to mitigate the exposure to styrene vapors. Skin & Eyes can also become exposed and sensitized to resins. It is best practice to wear both chemically resistant gloves and safety glasses while handling resins.

Ventilation Practices: Keeping fresh air circulating is key in promoting safety and for mitigating exposure to any type of resin. Although “Down Draft” booths and exhaust systems are nice to have, getting several fans going will help in eliminating any harmful exposure from occurring. The idea is to keep fresh air incoming and getting the smelly or potentially harmful concentrated vapors of resin away out and away from the working environment. Extractor Fans, Exhaust Fans, and Vent Hoods are all widely popular in the composite industry and can be built to fit any project or budget.

Always mix resin thoroughly in a well-ventilated area and only mix what is needed for a job. Temperature always plays a factor with cure and smell, the closer the cure area is to ~70F, the better the resin will cure. Once a resin is cured, resin no longer outgasses. While the smell may linger for a short period of time, proper ventilation will aid in getting rid of any smells associated with its cure.

Pungent smells propagated from resin may also be lessened by use of Baking Soda. Baking soda has long been used in homes refrigerators, freezers, and cabinets to absorb & neutralize unwanted smells keeping the enclosures fresh. Baking soda placed the same way within a box can be effective in absorbing the smelly vapors emitted from resins. It may not eliminate it totally but is a great tool to have with any ventilation system.

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