

# 減少黏合劑和密封劑 排放揮發性有機化合物

## REDUCE VOC EMISSION FROM ADHESIVES AND SEALANTS



### 為何要減少黏合劑和密封劑的揮發性有機化合物排放？

揮發性有機化合物是一種容易在室溫下揮發的化學品，可見於多種建築物料，包括漆料、稀釋劑、黏合劑及密封劑等。

黏合劑一般用作黏貼地毯和其他地台面，例如軟木及磁磚，以及用於安裝木製傢具、櫃面板、底層地板、護牆修飾夾板及復合層板。密封劑一般用於地板、洗滌槽、木製和普通傢具、覆蓋板、外牆板等用品作為填補、密封、防水或防風雨之用。傳統的黏合劑和密封劑通常含有石油或有機溶劑和大量的揮發性有機化合物，這些溶劑或揮發性有機化學物會在物料固化過程中釋放到大氣中。揮發性有機化合物的主要害處包括：

- 促使大氣中的臭氧和微粒形成，而造成煙霧和減低能見度。
- 影響室內空氣質素，對工人和處所使用者的健康造成不良影響。

由於黏合劑和密封劑產品用途廣泛，在使用和工程完成後，仍可長時間釋放揮發性有機化合物到大氣中，因此，黏合劑和密封劑產品是揮發性有機化合物的常見來源之一，導致大氣及室內空氣污染。

### 揮發性有機化合物如何影響我們？



吸入揮發性有機化合物可引致急性和慢性健康影響。很多揮發性有機化合物具刺激性，若吸入一定的分量，會抑制人體的中樞神經系統。有些揮發性有機化合物甚至具危險性，是損害生殖系統的毒物和致癌物。揮發性有機化合物會造成煙霧，刺激眼睛、鼻子及喉嚨，甚至令患有心臟或呼吸疾病（如哮喘）的人仕病情惡化。長時間身處嚴重的煙霧環境中，可能會對肺部組織造成永久傷害，以及損害人體的免疫系統。

### 如何使用黏合劑和密封劑？

由於傳統的溶劑性黏合劑和密封劑的不良影響日漸備受關注，很多製造商已改用低揮發性有機化合物的配方。現時，含低揮發性有機化合物及水劑性產品在市場上已有供應。為保障你本身、家人和工人的健康及保護環境，你可依照下列提示，精明地使用這些產品：

- 使用含低揮發性有機化合物或水劑性產品。你可要求供應商或商店提供這些較環保的選擇，並參閱產品的技術資料或物料安全數據資料，從而得知更多有關產品的訊息。



- 向承辦商及於建造或合約文件中指明需使用含低揮發性有機化合物的產品。
- 選用不含揮發性有機化合物的設計，例如選用無須使用黏合劑的地毯方塊、以釘子固定地毯代替膠黏地毯或使用其他非黏合的機械固定方法。
- 選用在出廠時已經完成以含低揮發性有機化合物或水劑性密封劑密封的木地板製品，以避免在工地現場使用密封劑。
- 選用預製實木製造櫥櫃和櫃枱面，以避免在工地現場使用黏合劑或密封劑。
- 可考慮只為現有地板進行翻新，而不作更換。這些木地板可略為車磨，然後塗上含低揮發性有機化合物或水劑性密封劑。
- 按照生產商的指示使用及處理黏合劑和密封劑，避免過量使用這些物料和稀釋劑。
- 選用不含甲醛及其他有毒化學品，例如三氯甲烷、二氯化乙烯、四氯乙烯及三氯乙烯的產品。

### 使用含低揮發性有機化合物的黏合劑和密封劑有何好處？

與十年前相比，目前含低揮發性有機化合物的產品已較為常見，而由於科技進步，這些產品的性能亦大為改善，當中有部分產品在惡劣環境下亦能發揮超卓的黏附能力。在成本和固化時間方面，部分產品甚至可與傳統產品相比，而有些產品的成本則可能較高，或需要較長的固化時間。不過，使用含低揮發性有機化合物的替代品，尤其是水劑性產品，可以帶來以下好處：



- 減少排放會形成煙霧並造成空氣污染而可引致疾病(如哮喘)的化學品。
- 顯著減少揮發性有機化合物的排放，而有較好的室內空氣質素，有助預防因揮發性有機化合物而引起的臭味滋擾、對眼睛和呼吸系統的刺激、頭痛、疲勞等毛病，以及其他對健康的不良影響。
- 減低發生火警和爆炸的危險，而不含可燃溶劑的低揮發性有機化合物含量的產品所受的貯存限制亦較少。
- 減低工人接觸有害化學品的機會，給工人一個較安全的工作環境，從而提高他們的生產力。
- 由於在使用水劑性產品後無需以溶劑清潔，因此可減省清潔上的成本和時間。

### 如欲查詢更多資料，請聯絡：

環境保護署  
香港灣仔告士打道稅務大樓33樓  
電話：2838 3111  
或瀏覽環保署網頁：<http://www.epd.gov.hk>

## Why do we need to reduce VOC emissions from adhesives and sealants?

Volatile organic compounds (VOCs) are chemicals that vaporize easily at room temperature and are found in many building materials such as paints, thinners, adhesives and sealants/caulks.

Conventional adhesives (commonly used for gluing down carpeting and other flooring surfaces such as cork and tile, and used in installation of cabinetry, countertops, sub-flooring, wainscoting and plywood decorative paneling, and laminates) and sealants (commonly used for sealing and weatherproofing floors, sinks, cabinetry and furniture, decking and exterior siding) usually contain petroleum or organic solvents and a high level of VOCs. During drying after application, their solvents, or VOCs, evaporate into the atmosphere. Major harmful effects of these VOCs would include:

- Enhancing the formation of ozone and fine particulates in the atmosphere, thus causing smog and visibility impairment.
- Affecting adversely the indoor air quality and the health of both the workers and occupants.

In fact, VOCs may continue to be released into the environment long after the work is completed. With such a wide range of uses, these products have generally been among the common sources of VOCs which may cause both ambient and indoor air pollution.

## How do VOCs affect us?



Exposure to VOCs may result in both acute and chronic health effects. Many of the VOCs are irritants and can cause depression of the central nervous system if inhaled in sufficient quantities. Some VOCs may even be hazardous, reproductive toxicants and carcinogenic. VOCs cause smog which can irritate our eyes, nose and throat, or can worsen existing heart and respiratory problems such as asthma. Prolonged exposure to severe smog conditions may cause permanent damage to lung tissues and impair the immune system.



## How should I use adhesives and sealants?

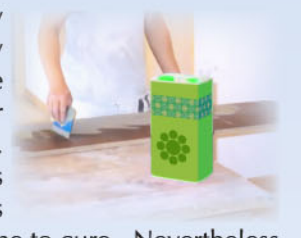
In response to growing concern about the harmful effects of the conventional solvent-based adhesives and sealants, many manufacturers have shifted to low-VOC formulation. Nowadays, low-VOC and water-based products are already available. To protect your and your family's health, the workers' health and the environment, you should use adhesives and sealants wisely by following these handy tips:



- Use low-VOC or water-based products. You may ask your vendors or the stores for these environmentally-more-friendly alternatives. You can also get more information about these products by referring to their Technical Data Sheets or Materials Safety Data Sheets.
- Specify low-VOC products to your contractors and in construction or specification documents.
- Choose VOC-free designs, such as carpet tiles which do not require adhesives, using nail strips instead of gluing carpet, or adopt other non-adhesive mechanical fastening systems.
- Use finished wood flooring products sealed with low-VOC or water-based sealant at the factory so that no adhesives or sealants are needed on-site.
- Use prefabricated solid wood for making cabinets and counters so that no adhesives or sealants are needed on-site.
- Consider refinishing the existing flooring instead of replacing it. Wood floors can be lightly machine-sanded and coated with low-VOC or water-based sealants.
- Follow manufacturer's instructions in using and handling adhesives and sealants, and avoid excessive use of these materials and thinners.
- Look for products which do not contain formaldehyde or other toxic chemicals such as chloroform, ethylene dichloride, perchloroethylene and trichloroethylene.

## What are the benefits of using low-VOC adhesives and sealants?

Low-VOC products are now more common than they were 10 years ago and their performance is greatly improved due to advancement in technology. Some low-VOC products are actually superior in their ability to adhere in the most difficult circumstances. The cost and curing time of some low-VOC products might even be comparable to conventional ones while others might cost a bit more and need more time to cure. Nevertheless, using low-VOC alternatives, especially water-based products, would have the following benefits:



- Reduced emissions of smog-forming chemicals leading to reduced air pollution which can cause illnesses, such as asthma.
- Better indoor air quality. The much reduced VOC emissions can help prevent VOC-related odour nuisance and VOC-related incidents of eye and respiratory irritation, headaches, fatigue, and other adverse health effects.
- Reduced fire and explosion risks. There are also fewer restrictions for storage of low-VOC products which do not contain flammable solvents.
- A safer working environment for workers due to reduced exposure to hazardous chemicals, which could result in higher productivity.
- Reduced cost and time for cleaning as solvent is not needed for cleaning when water-based products are used.

### For more information, please contact:

Environmental Protection Department  
33/F, Revenue Tower Gloucester Road, Wan Chai, Hong Kong  
Telephone: 2838 3111  
Or visit EPD's website at: <http://www.epd.gov.hk>