

## Chemical Emissions from Flooring Systems

Also a VOC commentary

Concerns are occasionally raised on the emissions from Polyester based flooring systems that contain Styrene. Nuplex brand names are Sureshield and Terrazzite. These products are market leaders in heavy duty industrial flooring for the food industry where they provide very high in-service performance. Styrene odours are usually commented on as the smell is very noticeable to the human nose.

Styrene is safe for human contact. There are no recorded instances of health problems associated with Styrene use even in industries where the use and contact is continuous. eg the boatbuilding and bathroomware industries.

The results below show two examples of test data on styrene monitoring carried out on Nuplex LSE (low styrene emission) flooring resin systems.

**Example 1:**

A Terrazzite floor was being installed at a city mall. Styrene levels were monitored using a pump and Styrene test tube over an 8hr period on two layers doing different work types.

Results:

Ref. BMcA 090798	Time (mins)	Air Volume (L)	Styrene air concentration ppm
Tube 1 Layer	480	34.75	9.4 ppm
Tube 2 Barrow hand	492	32.55	25.68 ppm

**Example 2:**

Styrene emission tests were performed on a Sureshield site: (ref: BMcA 140900)

Test	Procedure	Styrene ppm
1	Measurement was carried out for 4hours during laying. Site air extraction running. Test device was 5m from work site.	4.83
2	Test was started 1hr after laying finished and continued for an hour. Test device was 5m from work site. No air extraction.	1.28
3	Test was started 3hrs after laying and continued for an hour. Test device was 5m from work site. No air extraction.	0.64

**Result analysis:**

1. Emission levels are well within OSH and internationally accepted standards of 50 ppm (Time weighted Average 8hours) or 100ppm (short term exposure limit).
2. *The exposure readings relate to contractors handling the materials during the brief work exposure. Levels would be considerably lower for others not associated directly with the work.*
3. Slight odour occurs only during the Sureshield mixing and installation process. Odour ceases once the resin has gelled.
4. *Food materials containing fats may retain the Styrene odour and should be removed from the area during installation only.*
5. Should any Styrene odour be a problem, Nuplex offer alternate flooring systems: Supascreed epoxy, Surecote 500AR (high heat and chemical resistance) and Nuthane Polyurethane for high all-round performance.

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**VOC's and Resin Flooring** - Reactive Solidification – not Drying/evaporation

Sureshield and Terrazzite systems often create confusion when VOC levels are listed. Our MSDS sheets for these products list styrene at 30-50%, ie 300 -500 g/L VOC.

However the Resin system, Styrene and the catalyst activate when mixed and polymerize; almost in full. ie the Styrene turns into PolyStyrene which is a solid and is not emitted (ie not Volatile).

The volatile component (VOC) of the Polyester system is less than 5% (5g/L). Even then this emission occurs only during the liquid phase of the system (prior to solidifying).

Furthermore, the resin system is mixed with marble aggregates in the resin:marble ratio of 1:4 which dramatically reduces the styrene level.

Terrazzite in particular is an environmentally friendly product due to the use of natural marble aggregates. When cured, the floor is a “ Marble Floor” with less than 20% of the floor being synthetic. This compares most favorably with many other flooring materials.

Because of this we believe Terrazzite and Sureshield systems are compliant with Green Seal Standards.

These reactive resin systems cannot be compared with a standard solvent based paint. A paint with 15% VOC; (150g/L), will emit 150g/L of solvent to the atmosphere as it dries. All the solvent evaporates; none is reacted or retained.

Free Ph 0508-882288 Free Fax: 0508-553344  
For all data and MSDS sheets, please refer to our website.  
[www.nuplexconstruction.co.nz](http://www.nuplexconstruction.co.nz)  
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