



Amore Surfaces is made of 80%-85% amorphous silica, 10%-15% resin and <0.5% pigments.

The product is not hazardous in its solid form. The hazards of this product are associated mainly with its processing, cutting, grinding, drilling, and fabricating. Operations such as cutting, routing, drilling and sanding generate dust. High concentrations of dust cause harm to the respiratory tract, irritate eyes, nose, cause coughing & sneezing.

The product is **SAFER** than crystalline silica but this does not mean it's safe. Any dust exposure can be harmful to the respiratory system, so it's important to use appropriate protective measures.

**INHALATION:** Move to uncontaminated area - Wash hands and face - Get fresh air. Call physician if irritation persists.

**SKIN CONTACT:** No hazards which require special first aid measures. Wash hands

**EYES:** Flush the affected eye(s) with water or commercial eye wash. If unable to remove dust by this method, seek medical care.

**INGESTION:** No hazards which require special first aid measures

**FIREFIGHTING MEASURES**

- **AUTO IGNITION:** The product is not easily combusted. Decomposition products resulting from the polymer and pigments degrading at elevated temperatures include various hydrocarbons, carbon dioxide, carbon monoxide and water.
- **SUITABLE EXTINGUISHING MEDIA:** Water spray, Dry chemical, Carbon dioxide (CO<sub>2</sub>), Foam
- **UNSUITABLE EXTINGUISHING MEDIA:** No applicable data available.
- **SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:** No applicable data available.

**ENVIRONMENTAL PRECAUTIONS:** Work in Clean well-ventilated and aerated environment.

**SPILL CLEANUP:** Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Non-sparking tools should be used.

**ACCIDENTAL RELEASE MEASURES:** No applicable data available.

**HANDLING AND STORAGE HANDLING (Personnel):** Slabs are very heavy and breakable; handle carefully, with at least two people, to avoid injury and prevent damage. When handling this material always use industrial protective gloves, full body cover PPE and proper lifting devices/equipment. Also make sure that the lifting straps and lifting clamps are free from defects. Keep a safe distance when handling / lifting this material. Proper industrial hygiene practices should be followed after working with materials containing silica. Use soap and water to wash hands thoroughly after work. Change into clean clothes before leaving the worksite.

**STORAGE:** Store indoors; on safe and well secured Aframes

**CONDITIONS TO BE AVOIDED:** Do not store outside or use for outdoor applications as UV radiation may affect the material. Avoid hard impacts that could cause breakage. Avoid subjecting the material to high temperatures, as this may cause it to deteriorate. In its intended final use, do not place hot objects or pans recently taken off the hob onto the surface; use a trivet.

### PHYSICAL & CHEMICAL CHARACTERISTICS

No.	Test Item	Test Method	Result
1	Apparent Density	EN 14617-1:2013	2253 kg/m <sup>3</sup>
	Water Absorption		0.02%
2	Flexural Strength	EN 14617-2:2016	48.7 MPa
3	Abrasion Resistance	EN 14617-4:2012	30.5 mm
4	Thermal Shock Resistance	EN 14617-6:2012 & EN 14617-2:2016	
		Appearance	After 20 cycles of thermal shock: No obvious appearance of spots, no obvious swelling, no obvious cracking, no obvious scaling or exfoliation
		Change in mass, $\Delta m$	0.02%
		Flexural strength after thermal shock resistance	50.1 MPa
		Coefficient of thermal shock resistance as change in flexural strength, $\Delta R_f$ , 20	-2.90%
5	Impact Resistance	EN 14617-9:2005	5.44 J
6	Chemical Resistance	EN 14617-10:2012	Classification C <sub>4</sub>
7	Stains Resistance	EN 14617-10:2012 Annex A	No visible change
8	Linear Thermal Expansion Coefficient	EN 14617-11:2005	30.0 x 10 <sup>-6</sup> °C <sup>-1</sup>
9	Dimensional Stability	EN 14617-12:2012	Classification A
10	Compressive Strength	EN 14617-15:2005	171 MPa
11	Surface scratch hardness	EN 15771:2010	Mohs scale hardness 4
12	Thermal Conductivity and Thermal Resistance	EN 12664:2001 Heat Flow Meter Method	
		Thermal Conductivity	0.426 W/(m. K)
		Thermal Resistance	0.046 (m <sup>2</sup> · K) / W
13	Quantitative Analysis of Crystalline Silica	FTIR and XRD	
		Composition	Content, Wt%
		Crystalline Silica	Characteristic peaks of crystalline silica were not found
14	ASTM E84-24	Flame Spread Index, FSI 10	Class A
		Smoke-developed Index, SDI 400	



## **What kind of diseases are associated with exposure to amorphous silica dust during fabrication?**

Amorphous silica is generally considered less hazardous than crystalline silica, but it does still pose health risks under certain conditions, particularly with long-term (within few years of exposure).

### **Workplace Permissible exposure limit (PEL) for amorphous silica**

OSHA: The legal airborne permissible exposure limit (PEL) is 20 million particles per cubic foot (mppcf) or (80 mg/m<sup>3</sup>)/(%SiO<sub>2</sub>) averaged over a 8-hour workday

NIOSH: The recommended airborne exposure limit is 6 mg/m<sup>3</sup> averaged over a 10-hour workday

Note: Crystalline Silica NIOSH PEL: 50 µg/m<sup>3</sup> where as Amorphous Silica NIOSH PEL: 6 mg/m<sup>3</sup>

Here are some health risks and diseases associated with exposure to amorphous silica:

#### **1. Respiratory Issues:**

- Irritation: can cause irritation of the respiratory tract, leading to symptoms like coughing, sneezing, and shortness of breath.
- Amore Surfaces products contain polyester resin at a concentration of 10-15% by weight, which, when cut or ground with electric-powered tools, releases toxic volatile organic compounds (VOCs), including styrene, phthalic anhydride, benzene, ethylbenzene, and toluene. These cause various toxic effects to the human lungs, the most serious of which are asthma, bronchiolitis obliterans, decreased lung function, sclerosis and fibrosis.
- Chronic Respiratory Conditions: Exposure may contribute to chronic respiratory conditions, there is some evidence to suggest that it may contribute to chronic bronchitis. However, it is less likely to cause severe lung diseases like silicosis, which is more commonly associated with crystalline silica exposure.

#### **2. Lung Inflammation:**

Exposure to amorphous silica dust can cause inflammation in the lungs; Since the data have been limited, a risk of chronic bronchitis, COPD or emphysema cannot be excluded.

Animal inhalation studies with intentionally manufactured synthetic amorphous silica showed at least partially reversible inflammation, granuloma formation and emphysema, but no progressive fibrosis of the lungs.

- The product contains various pigments at a concentration of <0.5% some of which cause an immunologic lung disease called hypersensitivity pneumonitis characterized by granulomas in lung tissue.

#### **3. Kidney Damage:**

There is some evidence to suggest that long-term exposure (within less than 5 years) to amorphous silica could contribute to kidney damage, though this is less well-established compared to the risks associated with crystalline silica.

#### **4. Potential Carcinogenic Effects:**

Some forms of amorphous silica, particularly synthetic ones, have been studied for their potential carcinogenicity. However, the evidence is not as strong or as well-established as it is for crystalline silica. The International Agency for Research on Cancer (IARC) has classified amorphous silica as "not classifiable as to its carcinogenicity to humans" (Group 3), indicating that there is insufficient evidence to make a definitive conclusion.



#### 5. Dermal Irritation:

Direct contact with amorphous silica in powder form can cause skin irritation or dryness.

#### 6. Other:

- Animal studies have shown that exposure to silica nanoparticles can lead to cardiovascular outcomes such as atherosclerosis, thrombosis, and arrhythmia

In summary, while amorphous silica is generally safer and less harmful than crystalline silica, and it does not cause silicosis, it can still cause health issues, particularly with long-term exposure. Any dust exposure can be harmful to the respiratory system, so it's important to use appropriate protective measures, such as masks or ventilation systems, when working in environments where dust is present. And always follow OSHA guidelines

#### **FABRICATORS MUST FOLLOW CAL-OSHA GUIDELINES AT THE WORKPLACE WHEN CUTTING, FABRICATING & INSTALING THIS PRODUCT**

**WEAR PROTECTIVE APPAREL – UNIFORM – GLOVES – HELMETS – SAFETY SHOES – WEAR EYE PROTECTION WITH SIDE SHIELDS OR GOGGLES AND NIOSH APPROVED AIR\_SUPPLIED RESPIRATORS**

Cal-Osha link:

<https://www.dir.ca.gov/dosh/respiratory-silica-FAQ.html#exposures>

[https://www.dir.ca.gov/dosh/dosh\\_publications/emergency-silica-reg-employer-info.pdf](https://www.dir.ca.gov/dosh/dosh_publications/emergency-silica-reg-employer-info.pdf)

**MAKE SURE YOU WORK IN A CLEAN, TIDY & WELL-LIT ENVIRONMENT – ALWAYS CLEAN THE WORKPLACE WITH VACUUM EQUIPPED WITH FILTERS FOR DUST COLLECTION**

**USE THE CORRECT & NECESSARY TOOLS & MACHINERY THAT PROVIDE VENTILATION SYSTEMS; EXHAUST VENTILATION; WATER RECYCLING -**

**ALWAYS USE HIGH-PRESSURE WATER CUTTING MACHINERY (CNC: Water jet or Diamond Blade saw) NEVER EVER CUT THE PRODUCT DRY. Wet processing methods must always be used with all saws, and cutting, grinding and polishing tools.**

**SKIN PROTECTION:** During cutting, grinding or sanding operations, use appropriate body protection for tasks including work gloves if handling sharp or rough edges and steel-toed shoes if lifting product.

**Eye / Face:** During cutting, grinding or sanding operations, safety glasses with Protection: side shields or goggles should be worn. **WEAR EYE PROTECTION WITH SIDE SHIELDS OR GOGGLES**

**Hygiene:** Wash hands before eating and drinking and always wash contaminated clothes before using again.

**Methods of compliance.** Use effective wet methods that reduce airborne dust exposure

- Use “Wet Methods” to effectively suppress dust to limit exposures at the workplace
- Post hazard and warning information in the work area.
- Housekeeping and Hygiene.
  - Wastes, dusts, residues, debris, or other materials that are generated shall be promptly and properly cleaned at the end of each shift or more frequently as needed to ensure there is no visible dust build-up in the workplace.
  - Wet methods & Dust Sweeping vacuum cleaners equipped with HEPA filters shall be used to collect all wastes, dusts, residues, debris, or other materials.

**APPROVED AIR-SUPPLIED RESPIRATORS**

- A full face, tight-fitting powered-air purifying respirator (PAPR), or a respirator providing equal or greater protection, equipped with a HEPA, N100, R100, or P100 filter. A combination organic vapor and HEPA, N100, R100, P100 filter cartridge recommended. Or a NIOSH-approved **air-supply respirator**
- A full face, tight-fitting supplied-air respirator in pressure-demand or other positive pressure mode for any employees known to be diagnosed with confirmed silicosis, or who meet the definition of suspected silicosis, or whenever there is a medical recommendation to use a supplied-air respirator.
- We strongly recommend 3M Versaflo™ PAPR TR-600 Kit Model # H-7971

**Helpful links on exposure to Amorphous silica and its potential health effects:****From the CDC**

<https://www.cdc.gov/niosh/pel88/silicagl.html>

<https://www.cdc.gov/niosh/pel88/68855-54.html>

<https://www.cdc.gov/niosh/idlh/7631869.html>

<https://www.cdc.gov/niosh/npg/npgd0552.html>

<https://www.cdc.gov/niosh/docs/2003-154/method-cas6.html>

**From Agency for Toxic Substances & Disease Registry**

<https://www.atsdr.cdc.gov/toxfaqs/tfacts211.pdf>

**From NIH**

<https://www.ncbi.nlm.nih.gov/books/NBK592821/>

**From TCEQ Toxicology Division**

[www.tceq.texas.gov/downloads/toxicology/dsd/fact-sheets/amorphous\\_silica.pdf](http://www.tceq.texas.gov/downloads/toxicology/dsd/fact-sheets/amorphous_silica.pdf)

**Research Article**

<https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.801619/full>

<https://www.osha.gov/chemicaldata/613>