



## ASK JOE POWDER

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Our popular Ask Joe Powder blog has made its way to the pages of PCI magazine. What are your powder coating questions and challenges? Joe Powder, aka Kevin Biller of ChemQuest Powder Coating Research, shares his powder coating knowledge and expertise by answering questions sent in from around the world.

### Dear Joe,

I am new to powder coating technology. I was reading an on-line article on polyester powder coatings, and I see your name is mentioned in the article.

My question is: Is TGIC powder coating safe?

### Thank you.

Meilan Stone  
Michigan

### Hi Meilan,

Thank you for your question and for reading my article. Your question is a good one and is important to your operators and organization.

Are TGIC powder coatings safe? The key issue with this question revolves around a curing agent that is commonly used in polyester powder coatings. Triglycidyl isocyanurate is a compound that has been proven to cause mutations in laboratory testing. This information can be found in the Safety Data Sheet provided by your powder coating supplier. Specifically, it will list TGIC (CAS No. 2451-62-9) in Sections 3, 8, and 11 in the SDS. These sections detail the concentration of TGIC in the powder coating and what exposure limits are specified by the appropriate regulatory agencies.

TGIC is typically present at 3-5% in a polyester powder coating. This will vary based on the color and formulation.

TGIC-containing powder coatings can be safely used in an industrial setting if proper engineering controls are in place (mainly exhaust) and proper PPE (personal protective equipment) is used by operators that may encounter TGIC-containing powder coatings. Just as important is training of personnel and maintenance of your engineering controls.

I hope that this helps, and please let me know if you have any further questions.

**Kind regards,**

Joe Powder

### Dear Joe,

We are a powder coater and I've contacted you before, and you have always been extremely helpful. Yesterday our company brought in a Health & Safety Consultant to evaluate all the company's operations and practices. When the consultant observed our powder coating operation, I was informed that our painters could not use what is commonly called a painter's sock under their respirator.

All of our painters use well-maintained Honeywell/North Full-Face Respirators, Model 5400 with P100 Respirator Filter Cartridges. The painters wear full 3M Tyvek suits with hoods and boots.

I was told that this combination of PPE (personal protective equipment) wouldn't be considered acceptable to OSHA (Occupational Safety and Health Administration) because it didn't provide enough respiratory protection from the various harmful and dangerous components listed on the powder paint safety data sheets the auditors asked to review.

I was told the use of a painter's sock in conjunction with the other PPE we use, with or without the painters being clean shaven, wouldn't adequately block out the harmful/deadly microscopic components that can be found in powder paint.

A couple of our painters have very slight facial hair, most not more than a stubble <3 mm to 5 mm, which is one of the

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primary reasons why we went to using painter's socks. The socks made the use of the respirators more comfortable and allowed the painters to wear the respirators tighter.

Every painter is expected to perform the standard pre-use fit test as outlined on the large manufacturer's posters we have posted in English and Spanish on the wall next to their lockers.

Having painted powder myself using this PPE configuration I find it extremely hard to believe that this configuration wouldn't be considered adequate to protect our painters' respiratory systems from exposure to powder being sprayed in a flow-through style booth.

I know harmful contaminants are microscopic, but visibly, using this configuration of PPE, we've never had a painter exit the booth with any powder residue on the area protected by the painter's sock, respirator, or area protected by the full body suit when the PPE was worn correctly.

We don't powder coat with anything other than the typical types of powders, mostly polyester or epoxy based. We only paint in well maintained, clean, pass-through cartridge-style Nordson booths with air flow readings that are within the manufacturer's recommended parameters.

I'd appreciate any comments or suggestions you might have. From what I have observed on the internet, and I have looked at hundreds of videos, we far exceed what I typically see in powder coating videos, even those videos produced by the major powder gun and powder manufactures.

By the way, none of the Health & Safety Consultants that evaluated our operation had been to a powder coating facility.

The auditors have yet to issue their findings. I just want to find out as much as I can before the findings and recommendations come in.

Any assistance or information would be greatly, GREATLY, appreciated.

**My most sincere thanks,**

*Alan Russell*

*New Mexico*

## Hello Alan

Thanks for your message and thorough explanation. The PPE policy you have, and its implementation are impeccable and perfectly in compliance of a responsible and safe measure to protect your operators. Kudos to your team for establishing such a thorough and well-thought-out PPE system. A few salient points:

- The full-face respirator and Tyvek suits are totally adequate PPE to protect your operators from incidental exposure to powder coating particles. In addition, the use of the painter's sock is a thoughtful and acceptable measure for

operator comfort and to ensure best fit of the respirator. Furthermore, the stubble issue is being addressed with your fit program. No need to change any of this policy.

- The description of powder particles as "harmful/deadly" is patently wrong. Exposure to some powder coating particles can pose health issues such as skin irritation and in some cases potentially mutagen compounds, however, in the 60+ years of powder coating usage worldwide, there is absolutely no evidence or documentation of any fatalities from exposure to powder coating particles. Indeed, there is no evidence historically of any personnel that was ever exposed to powder coatings contracting cancer.
- Regarding the toxicological properties of any given powder coating, please refer to Section 11 of the Safety Data Sheet of the powder coating being used. This lists the toxicological potential per IARC, ACGIH, NTP, OSHA guidelines.
- Protecting your operators from powder coating particulates requires a two-part strategy. Mechanical system controls (adequate exhaust and air flow at powder discharge points, i.e. application booth) significantly reduce exposure to airborne particulates, and proper PPE ensures adequate protection of the operators. It is evident that your shop provides adequate measures for both.

Another PPE option to consider is the use of powered air purifying respirators. These use headgear that incorporate a filtered air supply that provides adequate respiratory protection with the added benefit of air movement that can keep the operator cooler than other PPE. Here is a link:

[Powered Air Purifying Respirator | Respiratory Protection | 3M - US](#)

Regardless, it is my professional opinion that the measures that your company are currently using to protect your operators from exposure to powder coating particles are acceptable and in compliance with industry standards.

Please let me know if I can help you further.

**Kind regards,**

*Joe Powder*

## Do you have a question for Joe Powder?

Email [kevinbiller@yahoo.com](mailto:kevinbiller@yahoo.com).

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