

Technical Data Bulletin

The Science of Protection: Choosing the Right Protective Coverall

3M™ recognise that different jobs require different levels of protection. This is one reason that the range of 3M™ Protective Coveralls is diverse, and designed to provide options for your application and purpose.

There are many different types of chemical protective coveralls, so how do you choose the right product for your needs? This article aims to help provide guidance for you through the selection process.

If the only consideration for designing and selecting protective apparel were penetration protection then coveralls would be made with the most protective fabric possible – most likely heavy and non-breathable. However, different applications require other considerations, such as the environment in which it is used, the task and the wearer. This results in the need for different designs and different fabrics.

As with any item of Personal Protective Equipment (PPE) the coverall should be the last line of defence. This means that the first thing to do is to try to eliminate the risk from the potential hazard rather than just relying on PPE. If this cannot be done then a safety assessment should be carried out by a competent person knowledgeable of the actual working conditions and limitations of PPE. All items of PPE should be considered but this article will just consider body protection.

So, what are some of the first things to consider when choosing the right Protective Coverall for your needs?

- **Question 1:** Is the possible contaminant hazardous?
- **Question 2:** If the contaminant is hazardous, the next thing typically considered is whether the risk is from liquids or dust particles. If the hazard is dust particles then a Type 5 coverall should be considered. In the 3M range of protective coveralls this includes most of the Category III coveralls.
- **Question 2a:** So if faced with a choice of several coveralls, all of which are certified as Type 5 coveralls, how can this be narrowed down to the one most suitable for your needs? The answer may be found by asking further questions such as whether there is a risk of contact with sparks or flames, whether linting may be an issue, whether there is a risk of heat stress, or whether an anti-static treatment is required.
- **Question 3:** If the hazard is liquid further questions need to be asked to determine the most appropriate coverall. One critical question is how extensive is the type of exposure likely to be?

3M™ Protective Coverall 4540+

If the risk is of a light splash from the hazardous chemical then a Type 6 coverall could be considered. Again there is a wide choice of Type 6 coveralls made from very breathable Spunbond (Meltblown Spunbond) SMS fabrics such as 3M™ Protective Coverall 4515 or 3M™ Protective Coverall 4520, or laminate fabrics such as 3M™ Protective Coverall 4510 or 3M™ Protective Coverall 4540+, or even a dual fabric coverall such as the 3M™ Protective Coverall 4540+ or 3M™ Protective Coverall 4535.



3M™ Protective Coverall 4540+



3M™ Protective Coverall 4565

3M™ Protective Coverall 4570







If the risk is of a jet or directed spray of a hazardous chemical then a Type 3 coverall may be considered. Type 3 coveralls are generally made from a non-microporous fabric that is often heavier than a Type 4 fabric. They also generally have taped seams to give added protection. In the 3M™ Protective Apparel range the 3M™ Protective Coverall 4570 meets the Type 3 requirements.



3M™ Protective Coverall 4570

NOTE: Whenever a protective coverall is being considered it is important to check that the coverall may provide protection against the specific chemical or hazardous substance being used.

The following table lists the products available from 3M™ for each Protection Type:

| Category | Protection Type | 3M™ Products | |
|--------------------------------------|---|--|--|
| Protection Levels CE Category III |  Gas-Tight | Type 1 - suits offer a high level of protection against gases, liquids and solid particles. | |
| |  Non Gas-Tight | Type 2 - suits offer some protection against gases but unlike Type 1, they are not completely “gas-tight”. | |
| |  Jet Tight | Type 3 - suits are used where there is exposure to liquids under pressure. | 3M™ Protective Coverall 4570 |
| |  Spray Tight | Type 4 - suits offer protection against liquid sprays and are used for higher volume, longer duration or more hazardous exposures than Type 6. | 3M™ Protective Coverall 4565 |
| |  Particle Protection | Type 5 - As the name suggests, products certified to Type 5 are generally suitable for dust applications. | 3M™ Protective Coverall 4510 3M™ Protective Coverall 4515 |
| |  Limited Splash | Type 6 - certified products offer low-level protection against small splashes and light mists. | 3M™ Protective Coverall 4532+ 3M™ Protective Coverall 4535 3M™ Protective Coverall 4540+ 3M™ Protective Coverall 4565 3M™ Protective Coverall 4570 |

NOTE: There are many other factors that may also need to be considered in choosing the most appropriate coverall. These include whether protection is required against biohazards, whether a low linting fabric is of high importance, whether a flame spread resistant fabric is required, or whether a fabric with an anti-static treatment would be beneficial.

However, even when the type or level of protection has been determined, there are other factors that need to be considered. These may include the following:

Size options

It is very important that the most appropriate size coverall is selected for each wearer. A coverall

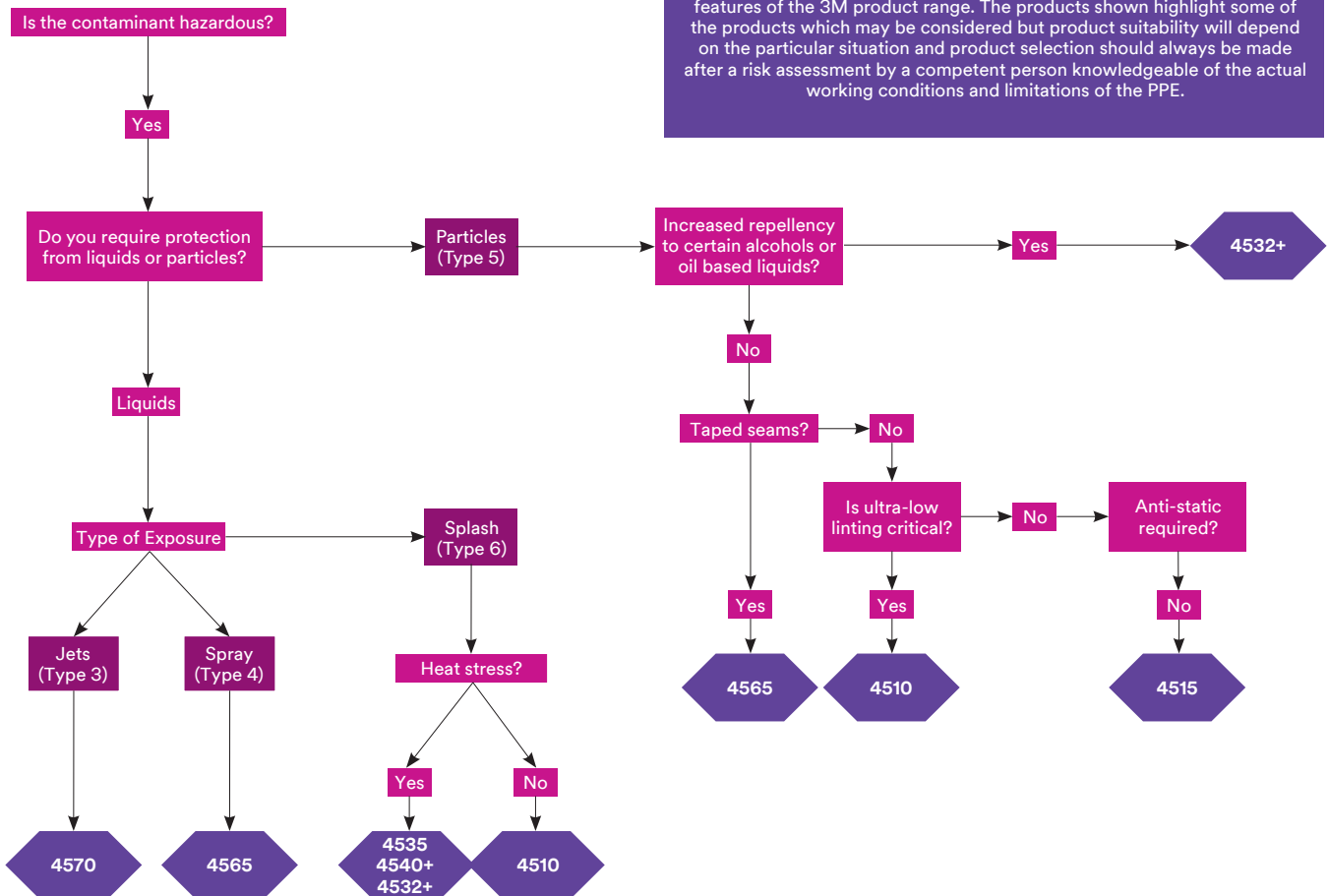
that is too big may create trip hazards as well as creating hollows in the fabric where hazardous liquids may pool. A coverall that is too small may not give the wearer the freedom of movement to safely carry out their work as well as not adequately covering the body.

Design

Coverallalls have different design features which may be more appropriate to certain applications. For example:

- Hooded or collared
- Elasticated cuffs, thumb loops or knitted cuffs
- Stormflap to cover the zipper or not
- Elasticated waists and ankles

Coverall Product Selector Guide



*Warning: This product selector is intended to provide guidance on key features of the 3M product range. The products shown highlight some of the products which may be considered but product suitability will depend on the particular situation and product selection should always be made after a risk assessment by a competent person knowledgeable of the actual working conditions and limitations of the PPE.



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