

Technical Data Bulletin

A Seam is not always what it Seems.

The primary purpose of a protective coverall is to protect. However, 3M recognizes that different jobs require different levels of protection. This is why the range of 3M™ Protective Coveralls is diverse, and designed to provide options for your application and work environment.

If the only consideration for designing and selecting protective apparel were protection, then coveralls would be made with the most protective fabric possible - heavy and non-breathable - and the seams would be fully sealed. We are going to look at the different types of seam and why 3M does not offer only one type of construction.

Let us begin by looking at the different types of seams.

The simplest seam is a **serged or overlocked seam**.

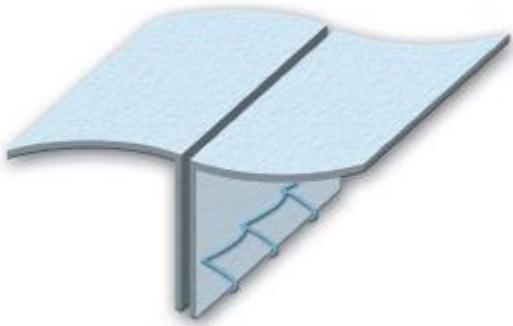


Figure 1. Serged seam

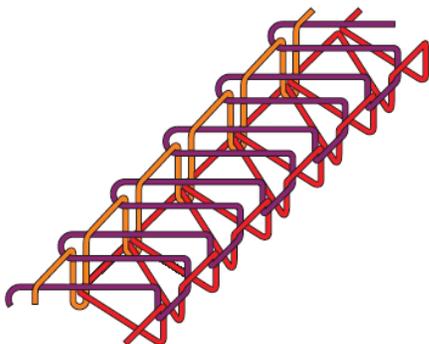


Figure 2. 3-thread overlock stitch.

SERGED SEAMS

A serged seam joins two pieces of material with an overlocking stitch that can either use 3 or 4 threads.

It is the simplest type of seam, but effective in holding the fabric together and resisting light splashes of liquid as well as dry particulates.

This method is commonly used on Type 5/6 Protective coveralls, such as the 3M™ Protective Coverall 4515.

For increased resistance to chemical penetration, some seams are **bound**.

BOUND SEAMS

A bound seam is similar to a serged seam but has a narrow strip of fabric sewn over the top of the two edges of the fabric, binding it together.

The purpose of this is to provide increased levels of holdout against inward leakage of either liquids or dust particulates and may also give added strength to the coverall.

This method is commonly used on Type 5/6 protective coveralls, such as the 3M™ Protective Coverall 4545.



Figure 3. Bound seam

The highest level of holdout against inward leakage in the 3M range is provided by **taped seams**.

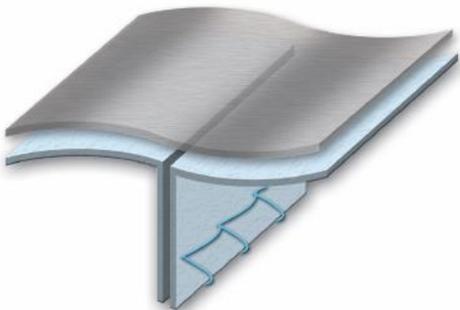


Figure 4. Serged and Taped seam

TAPED SEAMS

A taped seam is one where the two edges of the fabric are serged or sewn together and a protective tape is then applied over the seam. The tape is selected to have similar chemical resistance as the fabric the coverall is made from, as in the case of the 3M™ Protective Coverall 4570.

The tape completely covers the seam to provide the highest level of leak resistance.

The tape also makes the seam physically stronger.

So if Taped Seams offer a higher level of protection, why aren't they used on all coveralls?

Seam construction should be appropriate for the level of protection the coverall is intended to offer. For example, a taped seam would likely be an unnecessary expense for a coverall designed to offer limited protection against light splashes. And a serged seam would not be sufficient for a coverall intended for protection against strong directional jets of spray.

For each coverall model, 3M uses the most appropriate seam construction based on the type of fabric, the location of the seam on the coverall, and the level of protection required.

Type of Fabric - The range of 3M™ protective coveralls is made using several types of fabric. SMS (spun-bond melt-blown spun-bond) fabrics are the most breathable material. They are typically best suited for protection against dust particulates and light liquid splashes. Seams of coveralls made from this fabric generally use a serged overlock stitch. They provide a strong seam and an appropriate seal for Type 5/6 protection.

The lighter laminate fabrics are a different construction than SMS and can be thinner, so a bound seam may be required to give the suit increased holdout and offer a level of protection more generally associated with this fabric and the typical claims associated with it.

Location of the seam – 3M has discovered that certain areas of the coverall require stronger seams than others. This is why for certain coveralls additional binding has been added in the crotch area. Also, by analyzing the results of full suit spray tests 3M has learned that some fabrics benefit from additional binding on the horizontal seams.

To find out more about the seams used in our range, or which 3M™ Protective Apparel solution best meets your needs visit [3M.com/protectiveapparel](https://www.3m.com/protectiveapparel) or speak with your local 3M Application Engineer.

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