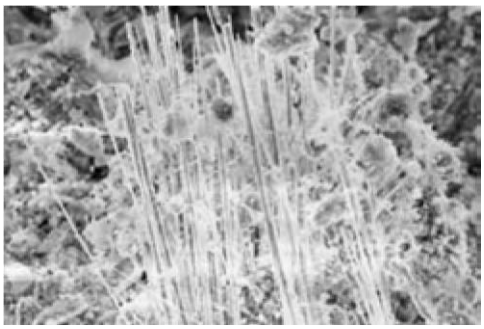
RISK SHEET:
ASBESTOS – A NATURAL FIBRE

Asbestos is a material with numerous qualities which was used on a massive scale before being shown to be highly toxic. Prohibited for use across Europe since 2005, it can still be found in many buildings and machines. Helping to keep workers in such environments safe, protective coveralls made of DuPont™ Tyvek® can provide durable, comfortable and robust protection against asbestos fibres.

DUPONT Tyvek®

Understanding the dangers of asbestos



Asbestos is the common name for several naturally occurring fibrous silicate minerals. Asbestos fibres are very heat resistant and strong and were used for many years in thermal insulating materials such as laggings and coatings, floor tiles, roofing, asbestos cement products, electrical insulating materials as well as vehicle clutch and brake linings. Since asbestos is a very friable material, microscopic fibres can release into the air in smaller or larger quantities. Inhalation of asbestos fibres can have serious health effects, including asbestosis, lung cancer and mesothelioma.

The Nordic countries banned asbestos between 1970 and 1980. The UK, Germany and France followed in the 1990s. Directive 2009/148/EC of the European Union bans all types of utilization of asbestos in all of its 27 member states. However, asbestos is still present in many buildings and other structures. Building maintenance workers are at a high risk of coming into contact with the fibres when working on insulation in buildings and industrial installations such as pipes, roofs, walls etc.

Minimising the risk when working with asbestos

The European Directive 2009/148/EC on the protection of workers from the risks related to exposure to asbestos at work and its amendments, deals specifically with protecting workers from the risks related to exposure to asbestos at work.

> ! *The member states have transposed the provisions of this directive into their own national legislations, while sometimes including additional requirements. Make yourself familiar with legislation in your country concerning personal protective equipment!*

Before any work is done, a comprehensive risk assessment has to be carried out and preventive measures have to be established. Employers have to provide the necessary organisation of work, appropriate equipment (including suitable personal protective equipment), safe systems of work, training, information, and supervision. Suitable personal protective equipment in general includes respiratory equipment, coverall, gloves and safety boots.

Choosing appropriate protective clothing

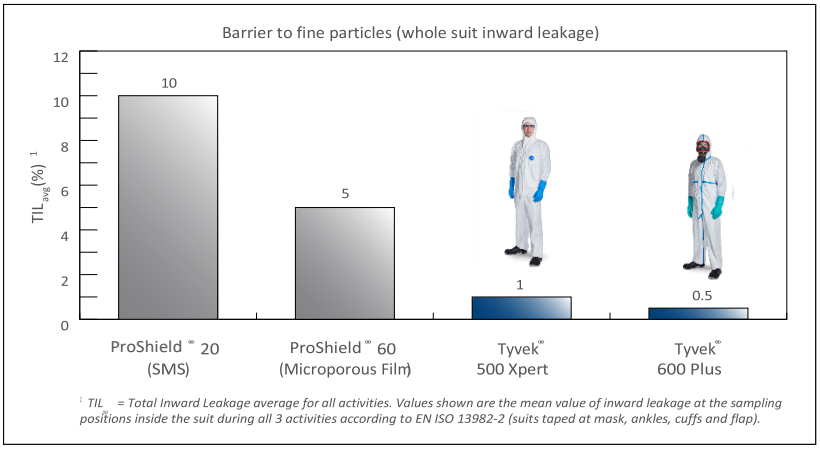
In order to avoid cross contamination, i. e. asbestos fibres attached to a person's skin or underwear are carried to uncontaminated places, released and then inhaled, protective coveralls must provide a high barrier against airborne particles (Category III, Type 5). They have to meet the following general requirements:

- High particle barrier (material, seams)
- Smooth surface to prevent particles from adhering to the garment
- Tight fit at arm and leg openings (elasticated cuffs and ankles)
- Compatible with additional PPE (masks, goggles, gloves)
- Comfortable to wear, high freedom of movement

However, existing national regulations may go even further: For example, the French decree n° 2012-639, which has come into force on 15 March 2013, dictates the use of a single-use garment that meets, at a minimum, the Type 5 level and has stitched and over-taped or welded seams. What is more, some work related with asbestos abatement may even require protective garments that are also resistant to light or heavy liquid spray (CE Category III, Type 3 and 4).

DuPont™ Tyvek® – Durable and robust protection against fine particles and fibres

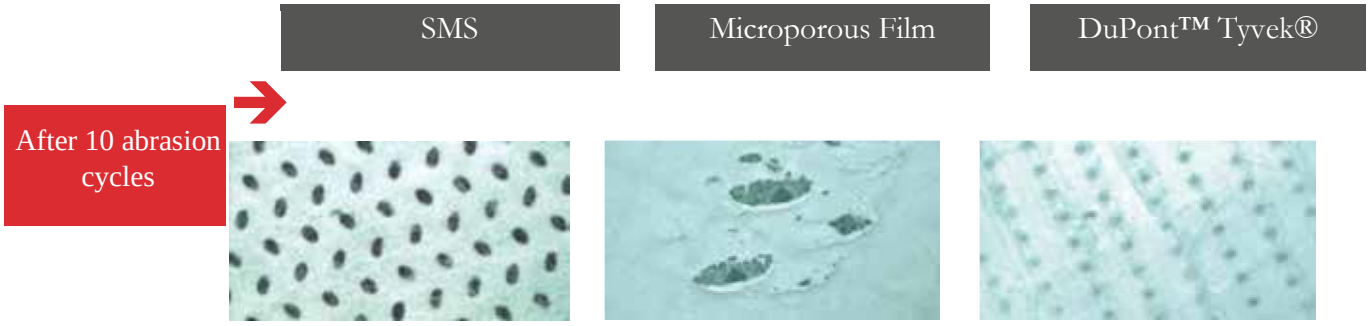
Protective coveralls made of DuPont™ Tyvek® such as Tyvek® 600 Plus and Tyvek® 500 Xpert provide an excellent barrier against airborne particles (Type 5). When comparing their barrier performance with other Type 5 suits made of MPF (Microporous Film) and SMS (Spunbond/Meltblown/Spunbond), the models made of Tyvek® show a significantly lower Average Total Inward Leakage (TIL_{avg}) according to EN ISO 13982-2* with an average value of less than 1%. The Type 5 product standard allows for an inward leakage of up to 15% in 8 out of 10 suits tested.



EN 1073-2** measures the inward leakage of particles into the whole suit. The result is then expressed as the Nominal Protection Factor (NPF) of a garment. Tyvek® 600 Plus and Tyvek® 500 Xpert meet the requirements of Class 2 (NPF > 50), whereas most other Type 5 protective suits are only Class 1 (see table below).

Coverall	Material/seams	Average Total Inward Leakage for All Activities TIL_{avg} (%)	Nominal Protection Factor (NPF)	Performance Class (EN 1073-2:2002)
ProShield® 20	SMS/stitched	10	10	1
ProShield® 60	Microporous Film/stitched	5	10	1
Tyvek® 500 Xpert	Tyvek®/stitched	1	268	2
Tyvek® 600 Plus	Tyvek®/stitched and over-taped	0.5	401	2

Thanks to the unique non-woven structure of Tyvek®, which forms a durable barrier against airborne particles and many water-based inorganic chemicals, barrier performance will remain intact even if the outer layers become abraded in places. With MPF, the protective outer layer is easily damaged by abrasion, whereas the more open structure of SMS allows more particles to penetrate the garment.



Beyond its high abrasion and tear resistance, Tyvek® is also lightweight and soft, as well as permeable to both air and water vapour, providing a high level of wear comfort. Thanks to its smooth surface and antistatic treatment, Tyvek® prevents particles from adhering to the coverall.

** EN ISO 13982-2: Protective clothing for use against solid particulates -- Part 2: Test method of determination of inward leakage of aerosols of fine particles into suits*

*** EN 1073-2: Requirements and test methods for non-ventilated protective clothing against particulate radioactive contamination*

DuPont™ Tyvek® 600 Plus, model CHA5a

Hooded limited-life chemical protection suit, Category III, Type 4-B, 5-B and 6-B.

- stitched and over-taped seams for high particle barrier performance
- elasticated face, wrists and ankles for tight fit
- elastic thumb loops prevent sleeves from riding up when working overhead
- self-adhesive chin flap; hood optimised for tight fit around respirator masks
- available with or without attached socks
- Tyvek® zipper with self-adhesive flap for enhanced protection
- also available with integrated socks to wear in your own boots/shoes; prevent particles from entering the garment through leg openings
- complies with the new French decree on PPE for workers exposed to asbestos fibres

Colours: white and green (sizes XS to 7X)

DuPont™ Tyvek® 500 Xpert, model CHF5

Hooded limited-life chemical protection suit, Category III, Type 5-B and 6-B.

- design and construction provides high protection against particles
- sleeve design prevents sleeves from riding up when working overhead
- optimised 3-piece hood design for tight fit around the face
- elasticated face, wrists and ankles for tight fit
- Tyvek® zipper with flap for enhanced protection
- overall ergonomic shape for perfect fit and protection when moving

Colours: white, green and blue (sizes SM to 3X)

Need help finding and selecting chemical protective clothing?

Try DuPont™ SafeSPEC™

Browse and compare products by brand, design or certification, with direct access to all relevant information including permeation data.

www.safespec.dupont.co.uk

It is the user's responsibility to determine the level of toxicity and the proper personal protective equipment needed. Anyone intending to use this information should first verify that the garment selected is suitable for the intended use. The enduser should discontinue use of the garment if the fabric becomes torn, worn or punctured, to avoid potential chemical exposure. Since conditions of use are beyond our control, we make no warranties, expressed or implied, including but not limited to warranties of merchantability or fitness for a particular purpose and assume no liability in connection with any use of this information.

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