Personal protective equipment sheets

Document no.: 0001-0410 V09
Class: RESTRICTED
Type: T09
Date: 2017-11-07

Wind. It means the world to us.™

Vestas proprietary notice

Trademarks and permissions

Document update

The contents of this document is subject to change without notice. All statements, instructions, and recommendations are believed to be correct at time of release, but changes are the result of continued progress in the product, methods, procedures, and manufacturing. Users must take full responsibility for their deployment and maintenance of any products.

For answers to questions about Vestas products or publications, contact your local Vestas representative.

Head office

Vestas Wind Systems A/S
Hedeager 42
8200 Aarhus N
Denmark

Wind turbine type

Read the full document before you start to do work.

Send questions or concerns about the document to Vestas Wind Systems A/S.

Wind turbine type	Mk version
All	All

Change description

Description of changes
The document is updated to the latest standard.

Table of Contents

1 Introduction

0011371314

This document provides information about the use of PPE when you do work in high-risk areas of the wind turbines. The document states the minimum requirements in the high-risk areas and includes both physical and chemical hazards.

If local requirements are stricter than the minimum requirements given in this document, local requirements must be followed.

All hazards identified are classified with a number (for physical hazards) or with a letter (for chemicals hazard groups) by the QSE assurance and the improvement department.

Additional information about the chemicals can be found in the related SDS for the specific chemical. The latest version of the SDS can be obtained from the 3E online system or the local SBU.

1.1 Abbreviations and technical terms

0011371313

Table 1.1: Abbreviations

Abbreviation	Explanation
AC	Alternating current
ASTM	American Society for Testing and Materials
ATPV	Arc Threshold Performance Value
DC	Direct current
ECC	Energy control coordinator
HV	High-voltage
LCTU	Lightning current transfer unit
LV	Low-voltage
OEL	Occupational exposure limits
PPE	Personal protective equipment
QSE	Quality, Safety, and Environment
SBU	Sales business unit
SDS	Safety data sheet
SPRA	Standard procedure risk assessment
TSS	Technology and Service Solutions
UV	Ultraviolet
VPP	Vestas Process Portal

Table 1.2: Explanation of terms

Term	Explanation
SUS-ASM-HRA	The risk assessment process in VPP.

1.2 Symbols and conventions

0011371312

The words and symbols that follow are used in this manual to alert the operator for specific information related to personnel or process.

	**Warning** Failure to obey the instructions of a warning can result in injury or death of a personnel.
	**Note** Clarified information or specific instructions which are relevant to the immediate instruction.

The symbols that follow are in accordance with EN ISO 7010:2012 standard.

ISO 7010-M001 **General mandatory action sign**		ISO 7010-M002 **See instruction manual/booklet**	
ISO 7010-M003 **Wear hearing protection**		ISO 7010-M004 **Wear eye protection**	
ISO 7010-M008 **Wear safety footwear**		ISO 7010-M009 **Wear protective gloves**	
ISO 7010-M010 **Wear protective clothing**		ISO 7010-M011 **Wash your hands**	

ISO 7010-M012 **Use handrail**		ISO 7010-M013 **Wear face shield**	
ISO 7010-M014 **Wear head protection**		ISO 7010-M015 **Wear high-visibility clothing**	
ISO 7010-M016 **Wear a mask**		ISO 7010-M017 **Wear respiratory protection**	
ISO 7010-M018 **Wear safety harness**		ISO 7010-M019 **Wear a welding mask**	

ISO 7010-M026 **Use protective apron**		ISO 7010-P003 **No open flames. Fire, open ignition sources, and smoking prohibited**	
ISO 7010-P022 **No eating or drinking**			

2 Combination of hazards

0011371311

The PPE sheets are divided into physical and chemical hazards. In some situations, there can be more than 1 hazard. If several hazards are identified, it is necessary to use PPE from several PPE sheets. An example of this can be the risk of high noise level when you do work with electrical equipment. In such cases, PPE from 2 PPE sheets needs to be combined to provide the correct protection.

When you combine the PPE sheets, it is important that you do proper risk assessment, since addition of 1 type of PPE can increase the possibility of other hazards. An example is to add hearing protection. This can cause people to be unaware of crane operations in the surroundings.

If you add a lot of additional PPE, it will give a false security to the personnel and will not give additional protection. It is important to only use the necessary PPE for the specific task identified in the risk assessment.

3 Physical hazards

0011371338

Vestas always tries to follow the guidelines to reduce risk and hazards at the root cause. This is done by removal of hazards in the design phase, by use of closed systems and protective shielding, by removal of the personnel from work, and, if it is necessary, by use of PPE.

The table table *From SUS-ASM-HRA, identification of hazards and assessment of risks*, page 9 lists the physical hazards, which are identified in the global risk assessment process (SUS-ASM-HRA identifies hazards and assesses risks), available in the VPP. The hazards listed in the SPRA are incorporated in these physical hazards and mentioned in the headline under each PPE sheet for the specific hazard.

For a few risks in the global risk assessment process, there is no appropriate PPE assigned. The reason for this is that protection against some of the identified risks cannot be achieved by use of PPE. In such cases, other precautionary measures (for example, good design of equipment and work area, training, and well-written instructions) must be taken. The global risk processes, which do not have a PPE sheet assigned, are:

- Risk of getting squeezed/caught between objects

- Risk of slipping, tripping, or falling on the same level
- Risk of being struck or rubbed against something fixed or stationary
- Risk of injury during transport

Similar to the risks in the global risk assessment process, there are also a few risks in the SPRA which do not have a specific PPE sheet assigned. These risks are:

- Risk of transformation and storage of parts on-site
- Risk of working with pressurised systems
- Risk of working on mechanical systems and portable electrical equipment
- Risk of working with pneumatic/hydraulic tools
- Risk of routine work

For these risks, several types of PPE can be necessary to use and, as mentioned above, a combination of PPE sheets must be used.

Table 3.1: From SUS-ASM-HRA, identification of hazards and assessment of risks

Overview of PPE sheets that cover physical hazards
See section 3.1 *PPE sheet 1, general PPE on site*, page 10 for PPE sheet 1
See section 3.2 *PPE sheet 2, risk of contact with cutting tools*, page 10 for PPE sheet 2
See section 3.3 *PPE sheet 3, risk of contact with high/low temperatures*, page 13 for PPE sheet 3
See section 3.4 *PPE sheet 4, risk of contact with sharp objects (except cutting tools)*, page 14 for PPE sheet 4
See section 3.5 *PPE sheet 5, risk of electrical arc flash*, page 15 PPE sheet 5
See section 3.6 *PPE sheet 6, risk of electrical shock (except static shock)*, page 16 for PPE sheet 6
See section 3.7 *PPE sheet 7, risk of static shock*, page 18 for PPE sheet 7
See section 3.8 *PPE sheet 8, risk of falling from heights*, page 18 for PPE sheet 8
See section 3.9 *PPE sheet 9, risk of hazardous atmosphere*, page 21 for PPE sheet 9
See section 3.10 *PPE sheet 10, risk of high noise level*, page 22 for PPE sheet 10
See section 3.11 *PPE sheet 11, risk of injury during manual handling, lifting, or carrying*, page 23 for PPE sheet 11
See section 3.12 *PPE sheet 12, risk of being struck by a moving, flying, or falling object*, page 24 for PPE sheet 12
See section 3.13 *PPE sheet 13, risk of exposure to light sources*, page 25 for PPE sheet 13
See section 3.14 *PPE sheet 14, risk of exposure to magnetism/electromagnetism*, page 26 for PPE sheet 14
See section 3.15 *PPE sheet 15, risk of being struck by compressed air/liquid*, page 27 for PPE sheet 15

3.1 PPE sheet 1, general PPE on site

0011371310

On-site work (construction and service)

This sheet provides information about the use of PPE when you do on-site work. For more specific/detailed information about the local requirements, see the local PPE overview available on site.

Head protection 	• Wear safety helmet.
Foot protection 	• Wear safety footwear.
High-visibility apparel 	• Wear high-visibility apparel.
Notes 	• No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin before you eat, smoke, go to the lavatory, and at the end of the day.

3.2 PPE sheet 2, risk of contact with cutting tools

0011371309

Cutting work (includes the use of knives, scissors, disc grinders, and cutting torch)

This sheet provides information about the use of PPE when you do work with cutting tools. For information about cuts from sharp edges, see section 3.4 *PPE sheet 4, risk of contact with sharp objects (except cutting tools)*, page 14.

Respiratory protection 	• There are no particular mask/respiratory requirements. • Use a mask/respirator with a particle cartridge/filter, if the process creates a lot of dust.
Hand protection 	• Use cut-resistant gloves or heat-resistant gloves, if you use a cutting torch. • Change the gloves if the gloves show signs of degradation or damage.
Eye protection 	• Use eye protection.
Body protection 	• There are no particular clothing requirements. • Use a coverall, which protects against particles, if the process creates a lot of dust. • Wear a protective apron and protective sleeves/arm guards if you use a gas cutter/cutting grinder.

Hearing protection 	• There are no particular hearing protection requirements. • Use hearing protection if the cutting tool generates a noise level of more than 80 dB.
Notes 	• You are not allowed to do work with cutting tools unless you have training or instruction on how to use the equipment.

3.3 PPE sheet 3, risk of contact with high/low temperatures

0011371308

Includes work with hot elements and contact with hot or cold surfaces

This sheet provides information about the use of PPE when you handle hot or cold parts.

Hand protection 	• Use hot/cold-resistant gloves. • Change the gloves if the gloves show signs of degradation or damage.
Eye protection 	• Use eye protection.

Body protection 	• There are no particular clothing requirements. • Wear cold/heat-resistant clothing or an apron if there is a risk of exposure to the body.
Notes 	• Make sure that the gloves are designed for the temperature to which the gloves are exposed.

3.4 PPE sheet 4, risk of contact with sharp objects (except cutting tools)

0011371307

Sharp edges (glass, fibreglass, and wind turbine blades)

This sheet provides information about the use of PPE when you handle sharp objects. For information about risks related to cutting tools, see section 3.2 *PPE sheet 2, risk of contact with cutting tools*, page 10.

Hand protection 	• Use cut-resistant gloves. • Change the gloves if the gloves show signs of degradation or damage.
Eye protection 	• Use eye protection.
Notes 	• Watch where you walk and pay attention to your surroundings. • Contact your manager on how to shield this hazard, if you notice a sharp edge on a machine or equipment.

3.5 PPE sheet 5, risk of electrical arc flash

0011371306

Arc flash (switchgear and HV/LV electrical equipment)

Risk of exposure to live circuits or short circuits! SPRA ID No. 3.01

- Obey the applicable LOTO procedures.
- Only qualified persons are allowed to do the work with HV/LV cables or equipment.
- Use the necessary PPE that is given in PPE sheets 5 and 6.
- De-energise/isolate the work place before you start to do the work.
- Use an HV/LV voltage detector to measure zero voltage before you start to do the work.
- Use certified and correct equipment.

This sheet provides information about the use of PPE when you do work with the equipment which can create an arc flash.

The information is identical with PPE sheet 6. See section 3.6 *PPE sheet 6, risk of electrical shock (except static shock)*, page 16 to find the relevant information.

Body protection 	
Hand protection 	
Face protection 	
Notes 	

3.6 PPE sheet 6, risk of electrical shock (except static shock)

0011371305

Electrical equipment (when you do live electrical work / when you work with HV/LV cables or equipment / use of external generator / when you enter an HV transformer room / when you operate an HV switchgear / when you work on an LCTU)

Risk of electrical shock!

- This sheet provides information about the use of PPE when you do work with electrical equipment. Refer 0017-5311* ‘Vestas Standard for Electrical Safety’ for information about hazards from electrical energy. For more information about electrical hazards, contact your ECC or areas responsible.

<table>
<tr><td>Body protection
  </td><td>

All personnel, who perform electrical work, must wear non-melting clothing. Acceptable non-melting fabrics include 100% cotton, 100% wool, and flame-resistant materials.
The requirement for non-melting clothing applies even when the equipment is locked out.
See 0017-5311* ‘Vestas Standard for electrical safety (section 9.3 and 10.4.1)’ for more information on precautionary measures.

</td></tr>
<tr><td>Hand protection
  </td><td>

Rubber insulating gloves must be used and selected in accordance with the table that follows:

<table>
<tr><th>Glove class</th><th>ASTM class colour</th><th>Proof test voltage (AC/DC)</th><th>Maximum use of voltage (AC/DC)</th></tr>
<tr><td>00</td><td>Beige</td><td>2,500/10,000</td><td>500/750</td></tr>
<tr><td>0</td><td>Red</td><td>5,000/20,000</td><td>1,000/1,500</td></tr>
<tr><td>1</td><td>White</td><td>10,000/40,000</td><td>7,500/11,250</td></tr>
<tr><td>2</td><td>Yellow</td><td>20,000/50,000</td><td>17,000/25,500</td></tr>
<tr><td>3</td><td>Green</td><td>30,000/60,000</td><td>26,500/39,750</td></tr>
<tr><td>4</td><td>Orange</td><td>40,000/70,000</td><td>36,000/54,000</td></tr>
</table>

Wear leather protective gloves over the rubber insulating gloves to prevent mechanical damage.
Composite rubber insulating gloves rated in accordance with EN 60903 do not require leather protectors.
See 0017-5311* ‘Vestas standard for electrical safety (section 10.2)’ for more information on precautionary measures.

</td></tr>
<tr><td>Face protection
  </td><td>

Where national regulations require the use of protective face shields to perform electrical work, the face shield must be arc-rated.
The suggested minimum arc rating for the face shield is an ATPV of 8 cal/cm^2 per ASTM F2175.
See 0017-5311* ‘Vestas standard for electrical safety (section 9.4 and 10.4.2)’ for more information on precautionary measures.

</td></tr>
<tr><td>Notes
  </td><td>

The PPE mentioned above reflects Vestas’ minimum PPE level used for protection against hazards from electrical power.
Requirements can vary in regions and countries due to legal requirements. Any local requirements stricter than Vestas’ requirements will have precedence and must be followed.
Use non-melting safety shoes.

</td></tr>
</table>

* Document for internal use at Vestas only.

3.7 PPE sheet 7, risk of static shock

0011371344

Static shock (build-up of static electricity on the blade/when you work on an LCTU)

This sheet provides information on the use of PPE when you do work with equipment which can cause a build-up of static electricity.

Hand protection 	• Use rubber insulating gloves. See section 3.6 *PPE sheet 6, risk of electrical shock (except static shock)*, page 16. • Change the gloves if the gloves show signs of degradation or damage.
Eye protection 	• Use eye protection.
Notes 	• Use rubber insulating gloves only when you have to install the earthing cable.

3.8 PPE sheet 8, risk of falling from heights

0011371343

Work at heights (platforms / ladders/scaffolding / nacelle roof / service lifts / inside nacelle with open hatch / when you work in the hub with the nose cone open)

Risk of fall to the ground! SPRA ID No. 1.04

- Do not do work in extreme weather conditions.
- Use the necessary PPE that is given in PPE sheet 8. The PPE must be attached to approved anchor points.
- Make sure that the applicable LOTO procedures are obeyed before you do work on the nacelle roof.
- Obey the rules for work at height. Refer to local requirements.
- Close and secure all roof access points to prevent falls into the skylight.
- Set up a perimeter and signs to make sure that there are no persons in the areas where overhead work is done.

This sheet provides information about the use of PPE when you do work at heights.

Fall arrest protection 	• Wear full-body harness. • Wear fall arresters for wire or rail system. • Use a lanyard with energy absorber/twin tail. • Position the rope.
Head protection 	• Wear a helmet equipped with a chin strap. • Wear a head lamp. Always make sure that the helmet is functional and has no scratches. If the helmet is scratched or otherwise damaged, it must be changed immediately. Attach a head lamp to the helmet for emergency light (a minimum of 35 lumen).
Foot protection 	• Wear safety footwear.
Hand protection 	• Use work gloves.

High-visibility apparel 	• Wear high-visibility apparel.
Notes 	

3.9 PPE sheet 9, risk of hazardous atmosphere

0011371342

Areas with a risk of hazardous atmosphere (includes areas defined as confined space)

Risk of lung injuries! SPRA ID No. 24.01

- Use the necessary PPE that is given in PPE sheet 9.
- Provide adequate fresh-air ventilation into the space.
- Examine the air within the work space before you enter the work space.
- Find out if local requirements or rules classify the work space as a confined space. If not, get special procedures. Obey all local requirements and rules and get the possibly necessary permits.

This sheet provides information about the use of PPE when you do work in areas with a hazardous atmosphere.

A hazardous atmosphere can occur when you use certain chemicals or gases in confined spaces. These chemicals can create explosive or asphyxiating environments. Never do work in an explosive atmosphere.

The hazardous atmosphere also covers oxygen-deficient atmospheres. The definition of an oxygen-deficient atmosphere varies from country to country and the range is from below 19.5% down to 17%. The specific percentage is evaluated according to the local legislation.
Never do work in a hazardous atmosphere or in confined space when you are alone or without the supervision of another personnel.

Respiratory protection 	• Use supplied air respiratory equipment.
Fall arrest protection 	• Use full-body harness (for emergency rescue).
	• Wear a helmet equipped with a chin strap.
Notes 	• Work in areas with hazardous atmospheres must be done by at least 2 personnel. 1 personnel must do the work in the area and 1 personnel must stand outside the work area. The personnel who does the work must wear a full-body harness so that the personnel outside the work area can pull the other person to safety, if it is necessary.

3.10 PPE sheet 10, risk of high noise level

0011371341

Noise from machines and electrical equipment

This sheet provides information about the use of PPE when you do work in areas with high noise levels. If you are in doubt about the noise level, always wear hearing protection.

Hearing protection 	• Use hearing protection. If the noise level exceeds 85 dB(A), hearing protection is necessary (the requirement is 85 dB(A) unless local legislation is more restrictive).
Notes 	• Use hearing protection when you start the work. All personnel in the work area must use hearing protection, not only the personnel who does the work. A rule of thumb: If you have problems with hearing a personnel in a normal tone of voice at a distance of 1 metre, the sound level is too high or near the limit. If this is the case, wear hearing protection until a measurement has verified the actual noise level.

3.11 PPE sheet 11, risk of injury during manual handling, lifting, or carrying

0011371340

Manual lifting of heavy objects

This sheet provides information about the use of PPE when you do manual handling, lifting, or carrying. For more information about correct manual handling, lifting, or carrying, see 0006-6346 ‘Ergonomic tool’ / 0009-4777 ‘Instruction manual’ / 0006-4578 ‘User manual’.

Hand protection 	• Use work or cut-resistant gloves. • Change the gloves if the gloves show signs of degradation or damage.
Notes 	• Make sure that you lift heavy objects in a correct manner. • Follow good practice when you manually lift or move heavy objects. • As a standard rule, you must be very careful when you lift objects that weigh more than 15 kg.

3.12 PPE sheet 12, risk of being struck by a moving, flying, or falling object

0011371339

For crane and lifting operations (crane operations during commissioning/ decommissioning of the wind turbine by use of a service crane, and transportation/ unloading of parts by use of a truck)

This sheet provides information about the use of PPE when you do work in areas where there is a risk of falling objects. Only operate equipment you are trained to use and have a valid certificate to operate the equipment.

Head protection 	• Wear a safety helmet.
Foot protection 	• Wear safety footwear.
Hand protection 	• Use cut-resistant or work gloves.
Eye protection 	• Use eye protection.
Notes 	• Do not operate the crane or lifting equipment unless you are trained to operate the crane or lifting equipment and you have the valid certificates.

3.13 PPE sheet 13, risk of exposure to light sources

0016319601

Exposure to lasers or strong UV light

This sheet provides information about the use of PPE when you do work in areas where there is a risk of exposure to strong light sources.

Hand protection 	• Use cut-resistant or work gloves.
Eye protection 	• Use eye protection. Make sure that you have the correct eye protection (for example, UV filters) for protection against the light source.
Notes 	• Always prevent exposure to strong light sources.

3.14 PPE sheet 14, risk of exposure to magnetism/electromagnetism 0016319600

For climbing of ladders and work near the gearbox

This sheet provides information about the use of PPE when you work in areas where magnetic fields are generated.

Notes 	• Personnel with pacemakers must be aware of magnetic fields. If the pacemakers can lead to risks, the work or access to the area is not allowed. • Do not wear PPE with metal as it can be affected by magnetic fields.

3.15 PPE sheet 15, risk of being struck by compressed air/liquid

0016319599

For work with pneumatic tools and pressurised equipment

This sheet provides information about the use of PPE when you do work in areas where there is a risk of being struck by compressed air/liquid.

Head protection 	• Wear a safety helmet.
Foot protection 	• Wear safety footwear.
Hand protection 	• Use latex or other rubber work gloves.
Eye protection 	• Use eye protection.

Body protection 	• Use protective clothing.
Notes 	

4 Chemical hazards

0011371360

When it comes to chemical hazards versus physical hazards, people often tend to only look at the intrinsic risk of the chemical materials. In most cases, it is also a good idea to start with the intrinsic risk, but this needs to be evaluated together with the application method, the amounts of material used, and the surroundings where the product is being used.

It is difficult to make standard PPE sheets that cover all types of application of chemical materials. To evaluate the use of chemical materials, this section with chemical hazards is divided into 3 groups to cover most of the possible application methods of the products in the wind turbine or in areas with room ventilation.

The 3 groups of chemical hazards are:

- Physical form
- Specific chemical properties
- Overall type of material

The reason to divide the products into 3 groups is that there are very different hazards which depend on the types that follow:.

1. **Physical form**

   In this category, the level of risk of exposure is much higher with gases than with solids. Different measures must be taken to protect against hazardous gases versus hazardous liquids or solids.

2. **Specific chemical properties**

   These are driver/key values for the intrinsic risks and classification of materials. The specific chemical properties identified and used today are as follows:

   - Corrosive properties due to pH value
   - Evaporation rate due to solvent amount
   - Ability to bond

3. **Overall type of material**

This category covers the material used, which requires different types of PPE. The material groups identified are as follows:

- Paint
- Glue
- Oil
- Grease
- Paste
- Joint filler and sealing compounds
- Solid hazardous material
- Soldering tin
- Flush

Table 4.1: Overview of PPE sheets for chemical hazards

Chemical hazards	Examples of product types
Aerosols/vapours, products under pressure See section 4.1 *PPE sheet A, aerosols/ vapours, products under pressure*, page 31 for PPE sheet A	Spray cans, spray products, and such like
Organic solvents See section 4.2 *PPE sheet B, organic solvents*, page 32 for PPE sheet B	Cleaning agents, thinner for paint, and such like
Paint and lacquers (with solvents) See section 4.3 *PPE sheet C, paint and lacquers (with solvents)*, page 34 for PPE sheet C	Paint and lacquer applied by brush/rolls
Paint and lacquers (without solvents) See section 4.4 *PPE sheet D, paint and lacquers (without solvents)*, page 36 for PPE sheet D	Paint and lacquer applied by brush/rolls
Glue and adhesives See section 4.5 *PPE sheet E, glue and adhesives*, page 36 for PPE sheet E	Acrylate, isocyanates/epoxy, and such like
Acids See section 4.6 *PPE sheet F, acids*, page 39 for PPE sheet F	Cleaning products
Oil substances, lubricants, grease, and paste See section 4.7 *PPE sheet G, oil substances, lubricants, grease, and pastes*, page 40 for PPE sheet G	Corrosive protection, release agents, wax and polish, cooling fluid
Aqueous products (pH-neutral) See section 4.8 *PPE sheet H, aqueous products (pH neutral)*, page 41 for PPE sheet H	Cleaning agents, antifreeze fluid, and such like
Joint filler and sealing compound See section 4.9 *PPE sheet I, joint filler and sealing compound*, page 42 for PPE sheet I	Edge sealers, sealing compounds, and such like

Chemical hazards	Examples of product types
Alkali See section 4.10 *PPE sheet J, alkali*, page 43 for PPE sheet J	Cleaning products and soaps
See section 4.11 *PPE sheet K*, page 44 for PPE sheet K	
See section 4.12 *PPE sheet L*, page 45 for PPE sheet L	
Solid hazardous materials See section 4.13 *PPE sheet M, solid hazardous materials*, page 46 for PPE sheet M	Pre-preg (fibreglass with wet epoxy), carbon, and such like
See section 4.14 *PPE sheet N*, page 47 for PPE sheet N	
Products for electronic parts See section 4.15 *PPE sheet O, products for electronic parts*, page 48 for PPE sheet O	Equipment for soldering
Bio-hazardous products See section 4.16 *PPE sheet P, bio-hazardous products*, page 49 for PPE sheet P	Water treatment, pesticides, and such like
Fuel See section 4.17 *PPE sheet Q, fuel*, page 50 for PPE sheet Q	Gasoline, diesel oil, and bioethanol
Gases / gas cylinders See section 4.18 *PPE sheet R, gases/gas cylinders* , page 51 for PPE sheet R	Nitrogen, oxygen, and such like
Dust See section 4.19 *PPE sheet S, dust*, page 52 for PPE sheet S	Brake pads and slip rings

To find the correct PPE sheet for chemical hazards

When you evaluate a new product specified by TSS and assign the correct PPE sheet, use the method that follows:

1. Identify the current physical form of the product and the physical form during application. The personnel must look at the application method and the temperatures and pressure during application.
2. If the product is in 1 of the states that follow, related sheet must be used.
   - Gaseous state
   - Aerosols/vapour
   - Solid
3. When the product is in a liquid state, the next step is to look at the specific chemical properties, such like solvent amount, pH-value, and the ability to bond. If the product has 1 of the listed chemical properties, assign the relevant PPE sheet.
4. If the product does not have any of the specific chemical properties, the product must be assigned to 1 of the overall types of material which include:
   - Paint and lacquer
   - Glue and adhesives

- Oil, grease, and paste
- Joint fillers and sealing compounds
- Soldering tin, paste, and flush
- Fuel

5. When the product is evaluated and the PPE sheet is found, do a check of the SDS for the product and make sure that the PPE referred to in the PPE sheet protects the personnel.

Example

The product Alphasyn PG 320 is a gear oil used in some wind turbines. If you obey the above method, the PPE sheet for this product is:

- The product is in a liquid state when applied in the gear.
- It does not have any of the specific chemical properties listed.
- Since the product is a gear oil, it belongs to the group for oil, grease, and paste, which means that PPE sheet G must be applied.
- The information about PPE in section 8 of the SDS confirms that the equipment specified in PPE sheet G will protect the personnel.

If the SDS does not contain information about which glove material to use, see section 5 *Appendix 1: Glove material guide*, page 54 for information about substances and permeation time through different glove materials.

4.1 PPE sheet A, aerosols/vapours, products under pressure

0011371337

Spray cans and products used by the application of pressure (sprayers and sprayers under pressure)

This sheet provides information about the use of PPE when you do work with products that must be sprayed. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.
For larger spray application than a quick spray, contact QSE for approval and use correct PPE.

Respiratory protection 	• Use a mask/respirator with a combination filter/cartridge which protects against organic vapours and particles/aerosols (for example, A2/P2-filters (brown and white)). • Other personnel present in the work area must also use masks/ respirators or alternatively leave the area. • Ventilate the work area during and after use. • Store combination filter/cartridge in a closed air-tight plastic container/ bag when not in use.
Hand protection	• Use thin nitrile disposable gloves. • Always discard the gloves after use or at an interval of 15 minutes. • Change the gloves if the gloves show signs of degradation or damage. Visually examine the SDS or the label on the container and use specific gloves, if it is specified.

	
Eye protection 	• Use eye protection. If the product is classified as corrosive or as harmful when in contact with skin, a face shield will provide additional protection of the face.
Body protection 	There are no particular clothing requirements. • Use a disposable coverall, if there is a risk of getting splashes on the body and the product is classified as harmful when in contact with the skin.
Notes 	• No smoking and no naked lights are allowed in the work area. • Do not expose sprayers to direct sunlight. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.2 PPE sheet B, organic solvents

0011371336

Cleaning agents, paint thinners, and such like

This sheet provides information about the use of PPE when you do work with organic solvents. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.
Always prevent that skin comes in contact with solvents.

Respiratory protection 	• Use a mask/respirator with a combination filter/cartridge which protects against organic vapours and particles/aerosols (for example, A2 or AX cartridges). • Change combination filters/cartridge as required by the manufacturer and when the substance can be smelled inside the respirator. • Other personnel present in the work area must also use respiratory protection or alternatively leave the area. • Ventilate the work area during and after use.
Hand protection 	• Use thick nitrile gloves (for example, Solvex with minimum thickness of 0,4 mm) if you use the solvent for less than 5 minutes and the hands are not in contact with the solvents. If the work takes longer time or if hands are in direct contact with the material, use a 4H/Silvershield glove under the nitrile gloves to protect against solvents. • Discard the gloves after use, if the gloves change shape and appearance, or if the gloves are damaged.
Eye protection 	• Use eye protection.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing. • Change clothing, if spilled upon.
Notes 	• No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use. • Always do a check of the SDS section 8 about PPE before you start the work. • Organic vapour cartridges like AX filters are for boiling points lower than 65 °C.

4.3 PPE sheet C, paint and lacquers (with solvents)

0011371359

Liquid applied with a brush or rolls. For paint applied as spray, see section 4.1 *PPE sheet A, aerosols/vapours, products under pressure*, page 31.

This sheet provides information about the use of PPE when you do work with paint and lacquers with solvents. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.
The PPE described in this section is only for surfaces less than 1m^2. For bigger surfaces, contact QSE before you start the work.

Respiratory protection 	• Use a full face respiratory protection/mask with a combination filter/ cartridge which protects against organic vapours and particles (for example, A2/P-filters). • Other personnel present in the work area must also use full face respiratory protection/masks or alternatively leave the area. • Ventilate the work area during and after use. • Change combination filters/cartridge as required by the manufacturer and when the substance can be smelled inside the respirator. • Store combination filter/cartridge in a closed air-tight plastic container/ bag when not in use. If the paint contains low boiling solvents (with boiling points lower than 65° C), AX-filters must be used. Discard the AX-filters on the same day after use.
Hand protection 	• Use thick nitrile gloves (for example, Solvex with minimum thickness of 0,4 mm) if you use the solvent for less than 5 minutes and if hands are not in contact with the solvents. If the work takes longer time or if hands are in direct contact with the material, use a 4H/Silvershield glove under the nitrile gloves to protect against solvents. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing (for example, splash-tight coverall ISO EN 13034 (type 6)). • Change clothing, if spilled upon.
Notes 	• No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.4 PPE sheet D, paint and lacquers (without solvents)

0011371335

Liquid applied with a brush or rolls. For paint applied as spray, see section 4.1 *PPE sheet A, aerosols/vapours, products under pressure*, page 31.

This sheet provides information about the use of PPE when you do work with paint and lacquers without solvents. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

The PPE described in this section is only for surfaces less than 1m^2. For bigger surfaces, contact QSE before you start the work.

Respiratory protection 	• Respiratory equipment is not necessary. • Ventilate the work area during and after use.
Hand protection 	• Use thin nitrile gloves. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing (for example, a splash-tight coverall ISO EN 13034 (type 6)). • Change clothing, if spilled upon.
Notes 	• No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.5 PPE sheet E, glue and adhesives

0011371354

Glue and adhesives applied by brush or rolls (examples of product types are epoxy, isocyanates, and acrylate glues)

Risk of exposure to hazardous substances and mixtures, adhesive! SPRA ID No. 2.02

- Use the necessary PPE that is given in sheet E. Read and obey the related SDS.

Spraying of glue is not covered in this PPE sheet. If the glue is to be applied by spray, QSE approval is necessary.

Substances that contain isocyanate and epoxy must not be used by personnel suffering from asthma, eczema, proven lung diseases or proven skin, or airway isocyanate allergies. This also applies to personnel who are suffering from excessively perspiring hands (hyperhidrosis manuum).

Respiratory protection 	• Always verify if respiratory equipment is necessary when you do work with glue/adhesives. • Unless specified differently in the SDS, use a respirator with a combination filter/cartridges which protects against organic vapours and particles when you glue the surfaces which are larger than 5 cm^2 (for example, AX/P2-filters/cartridge (brown and white)). • Discard the combination filter/cartridges on the same day after use.
Hand protection 	• Use thick nitrile gloves (for example, Solvex with minimum thickness of 0.4 mm). • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing (for example, a splash-tight coverall ISO EN 13034 (type 6)). • Change clothing, if spilled upon.
Notes 	• Always do a check of the SDS section 8 about PPE before you work with adhesives. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use. • To work with epoxy and isocyanates requires special training in some countries. Therefore, always make sure that you comply with the national/local requirements. • Apply warning signs around the work area to state that the product contains epoxy/isocyanate and that products are in use.

4.6 PPE sheet F, acids

0011371353

Sulphuric acid, phosphoric acid, and such like

This sheet provides information about the use of PPE when you do work with acids. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• Use a respirator with a combination filter/cartridge when you do work with the acid for more than 10 minutes (for example, A1B1E1P2 or similar).
Hand protection 	• Use thick nitrile gloves (for example, Solvex with minimum thickness of 0,4 mm). • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection. Wear face protection if there is a risk of splashes to the face.

Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing. • Change clothing, if spilled upon.
Notes 	• Acid and alkali is very harmful to the eyes due to their corrosive properties. Always make sure that eye flushing equipment is available before you start the work. • Do not mix or combine different substances as this can result in a hazardous combination (some acids can react with metal to create toxic gases). • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day.

4.7 PPE sheet G, oil substances, lubricants, grease, and pastes

0011371352

Oil products

This sheet provides information about the use of PPE when you do work with chemicals classified as oil, lubricants, or grease. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• A mask or respiratory protection is not necessary when you do work with oil at room temperature. • Use a filter mask/respirator with a combination filter (vapours and particle) when you work with hot oil (above 60°C). • Change filters when you notice a resistance over the combination or when the oil can be smelled through the combination filter.
Hand protection 	• Use nitrile disposable gloves when you work with oil substances. • Discard the disposable gloves after use and if the gloves change shape and appearance or if the gloves are damaged.

Eye protection 	• Use eye protection or a face shield when you handle concentrated substances and if there is a risk of drops or splashes.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing. • Change clothing, if spilled upon.
Notes 	• Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.8 PPE sheet H, aqueous products (pH neutral)

0011371351

Aqueous cleaners, anti-freezing products, and such like

This sheet provides information about the use of PPE when you do work with aqueous pH neutral products. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Hand protection 	• Use thin, nitrile disposable gloves. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection when you handle concentrated substances if there is a risk of drops falling into the eyes or contact with eyes.
Notes 	• Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.9 PPE sheet I, joint filler and sealing compound

0011371350

Fillers and sealing compounds (applied with a caulking gun, brush, or rolls)

This sheet provides information about the use of PPE when you do work with chemicals classified as fillers or sealing compounds. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• Respiratory equipment/masks are not necessary when you work with fillers and sealing compounds. If you do not work with fillers and sealing compounds, contact the local QSE for further assistance to evaluate the need of mask and choice of filter. Always do a check of the SDS and to see if the filler or sealing product requires respiratory protection because some products can contain solvents.
Hand protection 	• Use thin nitrile disposable gloves. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection when you handle concentrated substances if there is a risk that drops can fall into the eyes or come in contact with eyes.
Body protection 	• Use a disposable coverall when there is a risk of spillage on clothing. • Change clothing, if spilled upon.
Notes 	• Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.10 PPE sheet J, alkali

0011371805

Alkali (cleaning products with a high pH-value)

This sheet provides information about the use of PPE when you do work with chemicals with high pH value. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• Respiratory equipment/mask is not necessary when you do work with alkali that have low pH values. • Always examine the SDS for respiratory protection because chemicals with high pH value often require respiratory protection.
Hand protection 	• Use thin nitrile disposable gloves. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection.
Notes 	• Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.11 PPE sheet K

0011371349

This PPE sheet is intentionally left blank to keep the same alphabetical order of the other PPE sheets.

This sheet provides information about the use of PPE when you do work with XXX. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	
Hand protection 	
Eye protection 	
Body protection 	
Notes 	

4.12 PPE sheet L

0011371348

This PPE sheet is intentionally left blank to keep the same letters in alphabetical order of the PPE sheets.

This sheet provides information about the use of PPE when you do work with XXX. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	
Hand protection 	
Eye protection 	
Body protection 	
Notes 	

4.13 PPE sheet M, solid hazardous materials

0011371347

Solid hazardous materials

This sheet provides information about the use of PPE when you do work with solid hazardous materials. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

If the dust is generated during work, see section 4.19 *PPE sheet S, dust*, page 52.

Respiratory protection 	• Respiratory equipment/mask is not necessary when you do work with solid hazardous materials. • Always do a check of the SDS and use respiratory protection if specified in section 8 of the SDS.
Hand protection 	• Use thick nitrile gloves (for example, Solvex with minimum thickness of 0,4 mm). • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	• Use eye protection.
Body protection 	• The use of a protective coverall depends on the material. • Wear a protective coverall if there is a risk of exposure to the body.
Notes 	• Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.14 PPE sheet N

0011371346

This PPE sheet is intentionally left blank to keep the same letters in alphabetical order of the PPE sheets.

This sheet provides information about the use of PPE when you do work with XXX. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	
Hand protection 	
Eye protection 	
Body protection 	
Notes 	

4.15 PPE sheet O, products for electronic parts

0011371345

Soldering tin, paste, and flush

This sheet provides information about the use of PPE when you do work with soldering tin, paste, and flush. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• Use supplied air respirators if no ventilation is available.
Hand protection 	• Use thick nitrile gloves when you handle the materials.
Eye protection 	• Use eye protection.
Body protection 	
Notes 	

4.16 PPE sheet P, bio-hazardous products

0011371364

Water treatment products, pesticides, and such like

This sheet provides information about the use of PPE when you do work with water treatment products. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	• Generally, no respiratory protection is necessary for the specific product. • Always do a check of the SDS and see if respiratory protection is necessary for the specific product.
Hand protection 	• Use thin nitrile gloves.
Eye protection 	• Use eye protection.
Notes 	• When you work with materials that are classified as possibly toxic to the environment or to the aquatic environment, make sure that the materials are stored correctly so that there is no impact on the environment. • No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.17 PPE sheet Q, fuel

0011371363

Fuel including petrol, diesel, and bioethanol

This sheet provides information about the use of PPE when you do work with fuel. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

PPE is not necessary when you add fuel to a vehicle, transport equipment, or to a closed tank.

The PPE that follows is necessary if fuel is added to an open system or if fuel is used for purposes other than powering a vehicle or transportation equipment.

Respiratory protection 	**Be careful during respiration**. • Use a mask with organic cartridge/filter (for example, A2-filters (brown)) if fuels are used for more than 5 minutes. • Other personnel present in the work area must use masks or alternatively leave the area. • Ventilate the work area after use of fuel. • Change filters as required by the manufacturer and when the substance can be smelled through the filter. • Store filters in closed plastic container/bag when not in use.
Hand protection 	**Prevent skin contact**. • Use thick nitrile gloves (for example, Solvex with a minimum thickness of 0,4 mm) if you use the solvent for less than 5 minutes and the hands are not in contact with the solvents. If the work takes longer time or if hands are in direct contact with the material, use 4H/Silvershield gloves below the nitrile gloves to protect against solvents. • Discard the gloves after use and if the gloves change shape and appearance or if the gloves are damaged.
Eye protection 	**Prevent contact with eyes**. • Use eye protection.
Body protection 	**Prevent spillage on clothing**. • Use a disposable coverall when there is a risk of spillage on clothing. • Change clothing, if spilled upon.
Notes 	• No smoking and no naked lights are allowed in the work area. • Wash your hands and other areas of skin after you handle the substances and before you eat, smoke, go to the lavatory, and at the end of the day. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use.

4.18 PPE sheet R, gases/gas cylinders

0011371362

Gases and gas in pressure cylinders (oxygen, acetylene)

This sheet provides information about the use of PPE when you do work with gases/ gas cylinders. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

Respiratory protection 	There are no particular requirements for respiratory protection. However: • Make sure that all the fittings and hoses are tight. • Make sure that there is adequate ventilation in case of gas discharge.
Hand protection 	• Use thick leather gloves which protect against cold and pressure impact. • Make sure that the gloves are sufficiently loose so that it is easy to remove the gloves.
Eye protection 	• Use eye protection.
Notes 	• No smoking and no naked lights are allowed in the work area. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use. • Do not leave the hose connected to the cylinder in a restricted space overnight. Disconnect the hose.

4.19 PPE sheet S, dust

0011371361

Dust (for example, from fibreglass, brake pads, and slip rings)

This sheet provides information about the use of PPE when you do work with processes that create a lot of dust. Additional information is available on the SDS which can be obtained from the 3E online system and the local SBU.

- Use a vacuum cleaner (with a special fibre-absorbing filter) to remove dust from surfaces and to remove dust produced by the work process. This must be done before and during the work process.

Respiratory protection 	• Use dust masks/respiratory protection with a particle filter/cartridge (for example, N95/P2 filter (white)) when you do work, change, and clean dusty areas. • Use a dust mask with N100/P3 filter (white) when you change and clean the brake pads or the slip rings.
Hand protection 	• Use work gloves or goat skin gloves.
Eye protection 	• Use eye protection.
Body protection 	• Use a disposable dust-protective coverall (for example, an EN ISO 13982-1:2004 type-5 coverall).
Notes 	• If you get dust on your skin, make sure that the contaminated area is washed. • No smoking and no naked lights are allowed in the work area. • Do not store food, beverages, and tobacco together with chemicals. • Do not smoke, drink, or eat in the work area when the substances are in use. • Waste that contains residual/dust from the work process, vacuum cleaner filters, and PPE that was used must be collected in sealed packaging.

5 Appendix 1: Glove material guide

0016336977

Always use the correct glove material to handle chemicals as given in the SDS for the product. If the manufacturer of the product has not specified a specific glove type on the SDS, the tables that follow can be used to find the suitable glove material for the work.

Recommended>8 hours	5
Recommended>4 hours	4
Caution 1–4 hours	3
Not recommended<1 hour	2
Not tested/no valid information	1

Table 5.1: Master chemical resistance table

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Acetaldehyde	75-7-0	5	2	2	2	2	2	2	2	5	4	4
Acetic acid	64-19-7	5	2	3	2	2	2	2	3	4	3	5
Acetic acid (30–70%)	64-19-7	5	2	5	3	2	2	3	4	5	1	5
Acetic anhydride	108-24-7	5	2	3	2	1	1	2	2	5	1	5
Acetone	67-64-1	5	2	2	2	2	2	2	2	3	5	5
Acetone cyanohydrin	75-86-5	5	1	1	1	1	1	1	1	1	1	1
Acetonitrile	75-05-8	5	2	2	2	2	3	2	2	3	5	5
Acetonphenone	98-86-2	5	2	2	2	1	1	2	2	5	1	5
Acetoxyacetyl chloride	1383-1-31-7	5	2	4	3	1	1	1	5	1	1	1
Acetyl chloride	75-36-5	3	1	2	2	2	2	2	2	4	1	1
Acrolein	107-02-8	5	2	2	2	2	2	2	2	5	4	4
Acrylamide (30–70%)	79-06-1	5	2	2	5	1	1	4	4	5	1	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Acrylic acid	79-10-7	5	2	4	3	2	2	2	4	5	1	4
Acetyl-beta-mercaptoisobutyric acid	7649-7-39-7	1	1	1	1	1	1	1	1	1	5	1
Acrylonitrile	107-13-1	4	2	2	2	2	2	2	2	5	5	5
Adiponitrile	111-69-3	1	1	1	1	1	1	1	1	1	1	1
Aluminium sulfate hydrate <30%	1004-3-01-3	1	1	1	1	1	1	1	1	1	1	1
Allyl acrylate	999-55-3	1	2	2	2	1	1	2	2	1	1	1
Allyl alcohol	107-18-6	5	2	3	2	1	2	2	5	1	5	1
Allylamine	107-11-9	3	2	2	2	2	2	2	2	1	2	2
Allyl bromide	106-95-6	2	2	1	1	1	1	1	1	1	1	1
Allyl chloride	107-05-1	2	2	2	2	1	4	2	2	2	5	4
Ambush®	5264-5-53-1	1	1	3	4	2	1	1	2	1	1	4
9-Aminoacridine hydrochloride	90-45-9	5	5	5	1	1	1	5	1	1	1	1
2-(2-Amino ethoxy) ethanol	929-06-6	1	1	1	1	1	1	1	1	1	1	4
1-(2-Aminoethyl) piperazine	140-31-8	4	1	1	2	1	1	1	1	1	1	1
2-Aminopyridine	504-29-0	1	1	1	1	1	1	1	1	1	1	1
Ammonia, gas	7664-41-7	5	2	4	4	2	2	2	5	5	2	2
Ammonia, liquid	7664-41-7	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Ammonium acetate, sat	631-61-8	1	5	5	5	1	1	1	1	1	1	1
Ammonium bicabonate	1066-33-7	1	1	5	1	1	1	1	1	1	1	1
Ammonium cabonate, sat	506-87-6	1	5	5	5	1	1	1	1	1	1	1
Ammonium chloride, sat	1212-5-02-9	1	1	1	1	1	1	1	1	1	1	1
Ammonium fluoride 30–70%	1212-5-01-8	1	4	5	5	1	2	4	1	1	5	5
Ammonium hydroxide <30%	1336-21-6	5	3	5	5	2	2	4	5	5	2	4
Ammonium hydroxide 30–70%	1336-21-6	5	2	4	4	2	2	3	5	5	2	1
Ammonium nitrate	6884-52-2	5	1	5	1	1	1	4	1	1	1	1
Ammonium nitrate 30–70%	6884-52-2	5	1	5	1	1	1	4	1	1	1	1
tert-Amyl methyl ether	994-05-8	1	2	2	5	1	1	1	1	1	1	1
Aniline	62-53-3	5	1	1	1	1	5	1	1	5	5	5
Aqua regia (hydrochloric acid, 25–37% and Nitrile acid 63–75%)		5	2	5	4	1	2	3	5	1	1	4
Arsine	7784-42-1	1	1	1	1	1	1	1	1	5	1	1
Benomyl	1780-4-35-2	1	2	1	2	2	1	1	1	1	1	4
Benzaldehyde	100-52-7	5	2	2	2	1	4	2	5	1	5	5
Benzene	71-43-2	2	2	2	2	2	5	2	5	4	5	5
Benzeneaceto-nitrile	140-29-4	1	1	1	1	1	1	1	1	1	1	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Benzenesulfonyl chloride	98-09-9	1	1	1	1	1	1	1	1	1	1	1
Benzethonium chloride	121-54-0	5	5	5	1	1	1	5	1	1	1	1
Benzonitrile	100-47-0	5	2	2	2	1	5	2	2	1	1	1
3,3',4,4'-Benzophenonetetracarboxylic dianhydride	2421-28-5	1	1	1	1	1	1	1	1	1	1	4
Benzo(a) pyrene	50-32-8	1	1	1	1	1	1	1	1	1	1	1
p-Benzoquinone	106-51-4	1	2	2	2	1	1	2	1	1	1	1
Benzoyl chloride	98-88-4	3	2	2	2	1	5	2	5	5	5	1
Benzotrichloride	98-07-1	1	2	2	5	1	4	2	1	1	5	1
Benzyl acetate	140-11-4	1	2	1	2	1	1	1	1	1	1	4
Benzyl alcohol	100-51-6	5	2	3	4	1	2	2	5	5	5	5
Benzylamine	100-46-9	1	2	1	1	1	1	1	1	1	1	1
Benzyl bromide	100-39-0	1	2	1	1	1	1	1	1	1	1	1
Benzyl chloride	100-44-7	1	2	2	2	2	1	2	1	1	1	5
Benzyl chloroformate	501-53-1	1	1	1	1	1	1	1	1	1	1	1
n-Benzyl dimethylamine	103-83-3	1	1	1	1	1	1	1	1	1	1	4
Benzyl neocaprate	6679-4-75-0	1	1	1	4	1	1	1	1	1	1	1
Bicyclo[2.2.1] hept-5-en-2-ol acetate	6143-29-9	1	1	1	1	1	1	1	1	1	1	1
Bisphenol A diglycidyl ether	1675-54-3	3	2	2	1	2	4	2	1	1	5	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinylchloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Borane pyridine complex	110-51-0	1	1	1	1	4	1	1	1	1	1	1
Boric acid	1004-3-35-3	5	1	5	5	1	1	1	5	1	1	1
Boron trichloride (gas)	1029-4-34-5	1	1	1	1	1	1	1	1	1	1	1
Boron trifluoride (gas)	7637-07-2	1	1	1	1	1	1	1	1	5	1	1
Boron trifluoride ethyl etherate	109-63-7	1	1	1	1	1	1	1	1	1	1	1
Boron trifluoride methyl etherate	353-42-4	1	1	1	1	1	1	1	1	1	1	1
Bromine	7726-95-6	2	2	3	3	2	1	1	4	2	1	1
Bromine trifluoride	7787-71-5	2	1	1	1	1	1	2	1	1	1	1
Bromoacetonitrile	590-17-0	5	2	1	1	1	5	1	5	1	1	1
Bromobenzene	108-86-1	2	2	2	2	1	5	2	5	1	1	1
Bromochloromethane	74-97-5	1	1	1	1	1	1	1	1	1	1	1
Bromodichloromethane	75-27-4	2	2	2	2	1	4	2	4	1	1	1
2-Bromoethanol	540-51-2	5	2	1	2	1	2	2	5	1	1	1
2-Bromoethyl acetate	927-68-4	5	2	3	2	1	1	1	4	1	1	1
1-Bromoethyleth-yl carbonate	8976-6-09-6	1	1	1	1	1	1	1	1	1	1	4
1-Bromo-4-fluorobenzene	460-00-4	1	1	1	1	1	1	1	1	1	1	1
1-Bromopropane	106-94-5	2	2	2	2	1	5	2	1	3	5	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinyl chloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
1-Bromo-2-propanol	1968-6-73-8	5	2	1	2	1	5	1	5	1	1	1
3-Bromo-1-propanol	6271-18-9	5	2	5	2	1	5	1	5	1	1	1
3-Bromopropionic acid	590-92-1	5	3	4	3	1	2	3	1	5	5	1
1,3-Butadine (gas)	106-99-0	4	2	2	4	2	1	2	5	5	1	1
n-butane gas	106-97-8	1	1	3	5	1	2	5	4	5	5	1
1,4-butanediol diglycidyl ether	2425-79-8	1	1	1	1	1	1	1	1	1	1	4
n-butanol	71-36-3	5	2	4	3	2	3	3	5	5	5	5
sec-Butanol	78-92-2	5	2	1	4	1	1	1	1	5	5	5
tert-Butanol	75-65-0	5	2	5	5	1	1	1	1	5	5	5
2-Butanone peroxide	1338-23-4	4	2	4	1	1	1	1		4	1	1
2-Butene	107-01-7	1	2	1	1	1	1	1	1	1	1	1
1-Butoxy-2-propanol	5131-66-8	5	2	4	3	1	1	1	5	1	1	1
n-Butyl acetate	123-86-4	3	2	2	2	2	4	2	2	2	5	5
Butyl acrylate	141-32-2	3	2	2	2	1	1	2	2	2	1	5
n-Butylamine	109-73-9	2	2	2	2	1	2	2	2	3	1	1
sec-Butylamine	513-49-5	3	2	2	2	1	1	2	2	1	1	1
tert-Butylamine	75-64-9	4	2	2	2	1	1	2	2	1	1	1
Butyl benzyl phthalate	85-68-7	1	1	1	5	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinyl chloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
n-Butyl chloride	109-69-3	2	2	2	2	1	5	2	4	1	1	1
Butyldiglycol	112-17-4	5	2	3	4	1	5	3	5	5	1	1
Butyldiglycol acetate	124-17-4	5	2	2	4	1	1	1	5	1	1	1
1,4-Butylene glycol	110-63-4	5	1	1	5	1	1	1	1	1	1	1
Butyl ether	142-96-1	1	1	1	1	1	1	1	1	1	1	5
Butyl glycol	111-76-2	5	2	3	4	1	3	2	5	5	5	4
Butyl glycol acetate	112-07-2	5	2	1	1	1	1	2	2	1	1	1
tert-butyl hydrogenperoxide	75-91-2	1	1	4	3	1	1	1	1	1	1	5
tert-Butyl methyl ether	1634-04-4	2	2	2	5	1	1	1	5	1	1	1
tert-Butyl peroxybenzoate	614-45-9	5	1	3	1	1	1	1	1	1	1	1
p-tert-butyltoluene	98-51-1	2	2	2	4	1	5	1	5	1	1	5
Butyltriglycol	143-22-6	5	2	4	4	1	1	1	5	1	1	1
Butyraldehyde	123-72-8	5	2	2	2	2	2	2	2	1	1	1
Butyric acid	107-92-6	5	2	3	1	1	1	2	5	1	3	1
beta-Butyrolactone	3068-88-0	1	2	2	2	1	3	2	1	1	1	1
gamma-Butylrolactone	96-48-0	5	2	3	2	1	3	2	3	5	5	5
Cadmium oxide, solid	1306-19-0	1	1	5	5	1	1	1	1	1	1	1
Calcium chloride, 30–70%	1004-3-52-4	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Calcium hydroxide	1305-62-0	1	1	5	5	5	1	1	1	1	1	1
Camphor	464-49-3	1	1	2	4	4	1	2	1	1	1	1
Caprylic acid	124-07-2	2	2	5	5	1	1	2	5	1	1	1
Carbon disulfide	75-15-0	2	2	2	2	2	5	2	5	5	5	5
Carbon monooxide	630-08-0	1	1	1	1	1	1	1	1	1	1	1
Carbon tetrachloride	56-23-5	2	2	2	2	2	5	2	5	5	1	5
Chlordane	57-74-9	1	1	1	1	1	1	1	1	1	1	1
Chlordane 30–70%	57-74-9	1	1	1	1	1	1	1	1	1	1	4
Chlorine, gas	7782-50-5	5	1	5	4	2	1	2	5	5	5	5
Chlorine, liquid	7782-50-5	1	2	2	1	1	1	2	1	1	1	1
Chlorine dioxide gas, <30%	1004-9-04-4	1	1	1	1	1	1	1	1	1	1	1
Chlorine trifluoride gas	7790-91-2	1	1	1	1	1	1	1	1	1	1	1
Chloroacetic acid	79-11-8	4	2	4	2	1	2	2	5	1	1	1
Chloroacetic acid <70%	79-11-8	4	2	5	2	4	2	2	5	1	5	1
Chloroactone	78-95-5	1	1	1	1	1	1	1	1	1	1	4
Chloroacetonitrile	107-14-2	5	2	1	2	1	5	1	5	1	1	1
2-Chloroacetophenone	532-27-4	1	1	1	1	1	1	1	1	1	1	1
Chloroacetyl chloride	79-04-9	1	1	1	1	1	1	1	1	3	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
2-Chloroacrylonitrile	920-37-6	1	1	1	1	1	1	1	1	1	1	1
4-Chloroaniline	106-47-8	1	1	1	1	1	1	1	1	1	1	1
Chlorobenzene	108-90-7	2	2	2	2	1	5	2	5	5	5	1
4-Chlorobenzotrichloride	5216-25-1	1	2	2	5	1	2	2	1	1	1	1
4-Chlorobenzotrifluoride	98-56-6	2	2	2	4	2	3	2	3	3	1	1
2-Chlorobenzyl chloride	611-19-8	5	2	3	1	1	5	2	1	5	3	1
Chloroethane gas	75-00-3	1	2	1	1	1	1	1	1	1	5	1
2-chloroethanol	107-07-3	5	1	3	2	2	5	1	5	1	1	4
Chloroform	67-66-3	2	2	2	2	2	5	2	5	3	2	5
Chloromethyl methyl ether	107-30-2	1	2	1	1	1	1	1	1	1	1	1
4-Chloro-2-methylphenoxyacetic acid	94-74-6	1	1	4	3	2	1	3	1	1	1	4
2-(4-chloro-2-methylphenoxy) propionic acid	93-65-2	1	1	4	3	2	1	3	1	1	1	4
3-Chloro-2-methylpropene	563-47-3	2	2	2	1	1	2	2	5	1	1	1
1-Chloronaphatalene	91-58-7	2	2	2	2	1	4	2	5	5	5	1
2-Chloronitrobenzene	88-73-3	1	2	1	1	2	1	2	5	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinylchloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
4-Chloronitrobenzene	100-00-5	1	2	1	1	2	1	2	1	1	1	1
2-Chloro-2-nitropropane	594-71-8	5	2	2	2	1	5	2	2	1	1	1
p-Chlorophenol	106-48-9	1	1	1	1	1	1	1	1	1	1	1
Chloropicrin	76-06-2	1	1	1	1	1	1	1	1	1	1	1
Chloroprene	126-99-8	2	2	2	2	1	5	2	5	1	1	1
1-Chloropropane	540-54-5	1	1	1	1	1	1	1	1	1	1	1
3-Chloro-1,2-propanediol	96-24-2	1	1	1	1	1	1	1	1	1	1	1
1-Chloro-2-propanol	127-00-4	5	2	1	2	1	2	5	2	5	1	1
3-Chloro-1-propanol	627-30-5	5	2	1	2	1	2	2	5	1	1	1
Chlorosulfonicacid	7790-94-5	2	2	2	1	1	1	2	2	2	1	1
o-Chlorotoluene	95-49-8	2	2	2	2	2	3	2	4	5	5	1
p-Chlorotoluene	106-43-4	2	2	2	2	1	1	2	4	5	5	1
Chlorpyrifos, <30%	2921-88-2	1	1	1	1	1	1	1	1	1	1	1
Chloromethyl ether	107-30-2	1	2	1	1	1	1	1	1	1	1	1
Chlorotrimethylsilane	75-77-4	2	2	2	4	1	1	2	5	1	1	1
Chromic acid	7738-94-5	5	2	2	4	4	2	4	5	5	1	4
Chromium trioxide	1333-82-0	4	2	2	3	4	2	4	4	1	1	1
Chromosulfuric acid	6527-2-71-1	5	2	3	3	1	1	1	5	1	1	1
Chromosulfuric acid <30%	6527-2-71-1	5	3	5	5	1	1	1	5	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
C I Pigment Yellow 74	6358-31-2	1	5	5	1	1	1	1	1	1	1	1
Cobalt sulfate heptahydrate	1002-6-24-1	1	5	1	1	1	1	5	1	1	1	1
Creosote	8001-58-9	5	1	3	1	1	1	2	5	1	1	1
Creosote (Wood creosote)	8021-39-4	1	1	3	1	1	1	1	5	1	1	4
m-Cresol	108-39-4	5	2	4	3	2	1	3	5	1	1	1
o-Cresol	95-48-7	1	1	1	1	2	1	1	1	1	1	1
p-Cresol	106-44-5	5	2	5	1	1	1	1		5	1	4
Cresols, isomeric mixtures	1319-77-3	5	2	4	3	2	1	3		5	1	1
Crotonaldehyde	4170-30-3	5	2	2	2	2	2	2	2	1	1	1
Cumene	98-82-8	2	2	2	3	1	1	2	5	1	1	1
Cyanogen bromide gas	506-68-3	2	1	1	1	1	1	1	1	1	1	1
Cyanogen chloride gas	506-77-4	1	1	1	1	1	1	1	1	1	1	1
Cyclohexane	110-82-7	2	2	2	5	2	4	2	5	5	1	5
Cyclohexanol	108-93-0	5	2	5	5	1	5	4	5	5	5	4
Cyclohexanone	108-94-1	5	2	2	2	1	5	2	2	3	5	5
Cyclohexylamine	108-91-8	2	2	2	2	1	2	2	2	1	1	1
Cyclohexyl isocyanate	3173-53-3	1	1	1	1	1	1	1	1	1	1	1
1,5-Cyclooctadiene	111-78-4	4	2	2	4	2	1	2	5	5	1	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Cyclopentane	287-92-3	2	2	1	1	1	1	1	1	1	1	1
Cyclopentanone	120-92-3	1	1	1	1	1	1	1	1	1	1	4
Cyclopropane	75-19-4	2	2	1	1	1	1	1	1	1	1	1
Cypermethrin	5231-5-07-8	1	1	1	1	1	1	1	1	1	1	4
2,4-D dimethylamine ammonium salt	2008-39-1	1	5	5	5	1	1	5	1	1	1	1
Decanal	112-31-2	5	1	1	1	1	1	3	1	1	1	1
Diallylamine	124-02-7	2	2	2	2	1	4	2	4	1	1	1
Di-n-amylamine	2050-92-2	2	2	2	5	1	1	2	5	1	1	1
Diazinon, <30%	333-41-5	1	1	1	1	1	1	1	1	1	1	1
Diborane	1928-7-45-7	2	1	1	1	1	1	1	1	1	1	1
Dibromochloromethane	124-48-1	2	2	2	2	2	3	2	5	1	1	1
1,2-Dibromo-3-chloropropane	96-12-8	1	1	1	1	1	1	1	1	1	1	1
Di-n-butylamine	111-92-2	2	2	2	5	1	5	2	5	1	1	1
Di-n-butyl phthalate	84-74-2	5	2	3	5	1	5	2	5	5	1	4
1,3-Dichloroacetone	534-07-6	1	1	1	1	1	1	1	1	1	1	1
Dichloroacetyl chloride	79-36-7	2	2	2	2	1	3	2	5	1	1	1
3,4-Dichloroaniline	95-76-1	1	1	1	1	1	1	1	1	1	1	1
1,2-Dichlorobenzene	95-50-1	2	2	2	2	2	5	2	5	1	5	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
1,3-Dichlorobenzene	541-73-1	2	2	2	2	1	1	2	5	1	1	1
1,4-Dichlorobenzene	106-46-7	2	2	2	3	1	1	2	1	1	1	1
1,3-Dichloro-2-butene	926-57-8	1	1	1	1	1	1	1	1	1	1	4
1,4-Dichloro-2-butene	764-41-0	4	1	2	2	2	5	2	5	1	1	1
1,1-Dichloroethane	75-34-3	2	2	2	2	2	3	2	3	1	1	1
cis-1,2-Dichloroethylene	156-59-2	2	2	2	2	1	2	2	3	1	1	1
trans-1,2-Dichloroethylene	156-60-5	2	2	2	2	1	2	2	3	1	1	1
cis,trans-1,2-Dichloroethylene	540-59-0	2	2	2	2	1	2	2	3	1	5	1
1,2'-Dichloroethyl ether	111-44-4	1	1	1	1	1	1	1	1	1	1	1
1,1-Dichloro-1-fiuoroethane (Refrigerant 141B)	1717-00-6	2	2	2	3	1	1	2	2	2	5	1
2-(2,4-Dichlorophenoxy)propionic acid	120-36-5	1	1	4	3	2	1	3	1	1	1	4
1,2-Dichloropropane	78-87-5	2	2	2	2	1	5	2	5	1	1	1
2,3-Dichloro-1-propene	78-88-6	2	2	2	2	1	5	2	5	1	1	1
1,3-Dichloropropene	542-75-6	2	2	2	2	1	5	2	5	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VA-L)	Polyvinyl chloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Dichlorosilane	4109-96-0	1	1	1	1	1	1	1	1	1	1	1
1,1-Dichloro-1,2,2,2-tetrafluoroethane (CFC 114)	374-07-2	1	1	1	1	1	1	1	1	1	1	1
1,2-Dichloro-4-(trifiuoromethyl) benzene	328-84-7	1	1	3	4	1	1	2	5	1	1	1
Diesel fuel	6847-4-34-6	2	2	3	5	2	1	4	5	5	1	1
Diethanolamine	111-42-2	5	4	5	5	1	1	5	5	1	1	4
Diethylacetamide	685-91-6	1	1	1	1	1	1	1	1	1	1	4
Diethylamine	109-89-7	2	2	2	2	2	2	2	2	2	5	4
2-(Diethylamino) ethanol	100-37-8	5	2	2	5	1	5	2	5	1	1	1
N,N-Diethylaniline, crude	91-66-7	1	1	1	4	1	1	1	1	1	5	1
Diethylbenzene	2534-0-17-4	2	2	1	1	1	1	1	1	1	1	1
Diethylcarbonate	105-58-8	1	2	2	2	1	1	1	2	1	1	1
Diethyldichlorosilane	1719-53-5	2	2	2	5	1	2	2	5	1	1	1
Diethylene glycol	111-46-6	5	4	5	5	1	1	4	5	5	5	5
Diethylenetriamine	111-40-0	5	2	5	2	1	2	2	5	1	1	4
N,N-Diethylformamide	617-84-5	1	1	1	1	1	1	1	1	1	5	1
Di-(2-ethylhexyl) adipate	103-23-1	1	1	1	5	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinylchloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Di-(2-ethylhexyl) phthalate	117-81-7	5	1	1	3	1	1	2	5	1	1	4
N,N-Diethylhydroxylamine	3710-84-7	1	1	1	4	1	1	1	1	1	5	1
Diethylphthlate	84-66-2	5	1	5	5	1	1	1	5	1	1	4
N.N-Diethyl-m-toluidene. crude	91-67-8	1	1	1	1	1	1	1	1	1	1	1
Diethyl sulfate	64-67-5	1	1	1	1	1	1	1	1	5	1	1
1,1-Difluoroethane	75-37-6	1	1	1	2	1	1	1	1	1	1	1
2,3-Dihydrodecafluoropentane	1384-95-42-8	5	2	5	5	1	4	4	1	5	5	1
Diisobutylamine	110-96-3	2	2	2	5	1	5	2	5	1	1	1
Diisobutyl ketone	108-83-8	1	1	1	1	1	1	1	1	1	1	1
Diisooctyl phthalate	2755-4-26-3	1	2	1	5	1	1	1	1	1	1	1
Diisopropylamine	108-18-9	2	2	2	3	1	1	2	5	1	1	1
Dimethoxane	828-00-2	1	2	2	2	1	1	1	1	1	1	1
N.N-Dimethylacetamide	127-19-5	5	2	2	2	2	2	2	2	3	5	3
Dimethylamine	124-40-3	3	2	3	1	1	2	2	3	1	1	1
2-(Dimethylamino) ethanol	108-01-0	5	2	2	5	1	5	2	5	1	1	1
2-[(2 [-(Dimethylamino)ethoxy] ethyl)	8301-6-70-0	3	1	3	3	1	1	1	3	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
methylamino] ethanol												
3-(Dimethylamino) propylamine	109-55-7	5	2	2	2	1	2	2	2	1	1	1
N,N-Dimethylaniline	121-69-7	1	1	1	1	1	1	1	1	1	1	4
1,3-Dimethylbutylamine	108-09-8	2	2	2	2	1	2	2	2	1	1	1
N,N-Dimethylcyclohexylamine	98-94-2	3	1	3	3	1	1	2	3	1	1	5
Dimethyldichlorosilane	75-78-5	2	2	2	3	1	1	1	4	1	1	4
Dimethyldiglykol	111-96-6	1	1	1	1	1	1	1	1	1	5	1
Dimethyl disulfide	624-92-0	1	1	1	1	1	1	1	1	1	1	1
Dimethyl ether	115-10-6	5	2	5	1	1	1	2	1	1	1	1
N,N-Dimethylethylamine	598-56-1	1	1	1	1	1	1	1	1	1	1	2
N,N-Dimethylformamide	68-12-2	5	2	2	2	2	2	2	2	3	5	5
1,1-Dimethylhydrazine	57-14-7	5	2	2	2	2	2	2	2	5	1	1
Dimethyl malate	624-48-6	1	1	1	1	1	1	1	1	1	1	1
2,6-Dimethylmorpholine	141-91-3	1	2	2	2	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
N,N-Dimethylpiperazine	106-58-1	3	2	2	3	1	1	2	2	1	1	1
N,N-Dimethyl-1,3-propanediamine	111-33-1	3	1	3	3	1	1	2	3	1	1	1
Dimethyl sulfate	77-78-1	3	2	4	2	1	1	2	4	5	1	4
Dimethyl sulfide	75-18-3	1	2	1	1	1	1	1	1	1	1	1
Dimethyl sulfoxide	67-68-5	5	2	4	3	1	2	2	2	5	5	5
Dimethyl-d6 sulfoxide	2206-27-1	1	1	1	1	1	1	1	1	1	1	1
Dimethylvinyl chloride	513-37-1	2	2	2	2	1	2	2	3	1	1	1
2,4-Dinitrotoluene	121-14-2	1	2	2	2	1	1	2	1	1	1	1
2,4-Dinitrotoluene, 30–70%	121-14-2	5	2	3	2	1	1	2	3	1	1	1
4,6-Dinitro-o-cresol	534-52-2	1	2	4	4	1	1	2	1	1	1	1
Di-n-octyl phthalate	117-84-0	5	3	5	4	1	2	2	5	5	5	4
1,3-Dioxane	505-22-6	5	2	2	2	2	2	2	2	1	1	1
1,4-Dioxane	123-91-1	5	2	2	2	2	2	2	2	3	5	5
Diphenylamine	122-39-4	5	1	3	2	1	1	1	5	1	1	1
1,3-Diphenylguanidine	102-06-7	1	5	5	1	1	1	1	1	1	1	1
Diphenyl phosphite	4712-55-4	1	1	5	1	1	1	1	1	1	1	1
Di-n-propylamine	142-84-7	2	2	2	2	1	1	1	3	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Dipropylene glycol	2526-5-71-8	5	1	1	5	1	1	3	1	1	1	1
Diquat dibromide (Reglone®)	85-00-7	1	1	1	1	1	1	1	1	1	1	4
Divinylbenzene	1321-74-0	2	2	2	2	1	5	2	5	1	5	1
Dodecane	112-40-3	1	1	1	1	1	1	1	1	1	1	5
Dodecylbenzenesulphonica-cid	2717-6-87-0	1	1	1	5	1	1	1	1	1	1	1
Dynamite (Ethylene glycol dinitrate, 70% and Nitroglycerine, 30%)		1	1	3	4	1	1	3	1	1	1	1
Epibromohydrin	3132-64-7	5	2	2	2	1	5	2	5	1	1	1
Epichlorohydrin	106-89-8	5	2	2	2	2	4	2	2	5	5	4
1,2-Epoxybutane	106-88-7	3	2	2	2	2	1	2	2	4	3	5
Epoxytrichloropropane	6766-4-94-2	1	2	2	2	1	1	2	1	1	1	1
Ethanol	64-17-5	5	2	4	3	3	2	2	5	5	5	5
Ethanolamine	141-43-5	5	2	3	2	2	2	2	2	1	1	2
Ethanolamine, 30–70%	141-43-5	5	2	3	2	2	2	2	2	1	1	2
Ethidium bromide, <30%	1239-45-8	5	1	1	5	1	1	1	1	5	5	1
1-Ethoxy-2-propanol	1569-02-4	1	1	1	2	1	1	1	1	1	1	1
2-Ethoxy-1-propanol	1908-9-47-5	1	1	1	1	1	1	1	1	1	1	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinylalcohol (PVAL)	Polyvinylchloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
1-Ethoxy-2-propylacetate	5483-9-24-6	1	1	1	1	1	1	1	1	1	1	5
Ethyl acetate	141-78-6	3	2	2	2	2	4	2	2	2	5	5
Ethyl acrylate	140-88-5	4	2	2	2	2	5	2	2	1	1	4
Ethylamine	75-04-7	5	2	3	2	2	2	2		1	1	2
Ethylamine 30–70%	75-04-7	5	2	3	2	2	2	2		1	1	2
Ethyl-3-aminocrotonate	626-34-6	1	1	1	3	1	1	1	1	1	5	1
Ethyl benzene	100-41-4	2	2	2	2	2	2	2	5	5	1	1
Ethyl bromide	74-96-4	2	2	2	2	1	3	2	3	1	1	1
Ethyl-n-butylamine	1336-0-63-9	2	2	2	2	1	4	2	2	1	1	1
Ethyl butyrate	105-54-4	3	2	2	2	1	1	1	2	1	1	1
Ethyl bromoacetate	105-36-2	1	1	1	1	1	1	1	1	1	5	1
Ethyl chloroformate	541-41-3	1	2	1	1	1	1	1	1	1	1	1
Ethyldiglycol	111-90-0	1	1	1	1	1	1	1	1	1	1	1
Ethyldiglycolacetate	112-15-2	5	2	5	2	1	1	2	2	1	1	1
Ethylene	74-85-1	1	1	1	1	1	1	1	1	1	1	1
Ethylene carbonate, 30–70%	96-49-1	5	4	5	5	1	1	1	5	1	1	1
Ethylenediamine	107-15-3	5	2	4	2	3	2	2	2	1	1	1
Ethylene dibromide	106-93-4	2	2	2	2	2	5	2	5	1	1	5
Ethylene dichloride	107-06-2	2	2	2	2	2	4	2	5	5	5	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinyl chloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Ethyl 3-ethoxypropionate	763-69-9	1	1	1	3	1	1	1	1	1	1	1
Ethylene glycol	107-21-1	5	5	5	5	5	3	5	5	5	5	5
Ethylene glycol dimethyl ether	110-71-4	4	2	2	2	1	2	2	2	1	1	1
Ethyleneimine	151-56-4	5	2	2	1	1	1	1	1	1	1	1
Ethylene oxide gas	75-21-8	3	2	2	2	2	1	2	2	4	3	5
Ethyl ether	60-29-70	2	2	2	2	2	5	2	2	2	5	5
Ethyl format	109-94-4	3	2	2	2	1	1	1	2	1	1	1
Ethyl glycol	110-80-5	5	2	3	3	1	2	2	2	4	5	5
Ethyl glycol acetate	112-15-9	5	2	3	3	2	4	2	2	3	5	4
2-Ethylhexanoic acid	149-57-5	1	1	4	4	1	1	4	1	1	1	1
2-Ethyl-1-hexanol	104-76-7	5	2	5	1	1	4	1	5	1	1	1
2-Ethylhexyl acrylate	103-11-7	4	2	1	4	1	1	1	1	1	1	1
Ethyl L-lactate	687-47-8	5	2	3	4	1	3	2	4	5	5	1
Ethyl mercaptan	75-08-1	1	2	1	1	1	1	1	1	1	1	1
Ethyl methacrylate	97-63-2	4	2	2	2	2	5	2	2	1	1	1
Ethyl parathion	56-38-2	1	1	1	1	1	1	1	1	1	1	1
Ethyltriglycol	112-50-5	5	1	4	4	1	1	3	5	1	1	1
Ethyl vinyl ether	109-92-2	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Ethyl vinyl ketone	1629-58-9	1	2	1	1	1	1	1	1	1	1	1
Ferric chloride	7705-08-0	1	1	5	5	1	1	1	1	1	1	1
Fluorine	7782-41-4	2	1	1	1	1	1	2	1	1	1	1
Fluorobenzene	462-06-6	1	1	1	1	1	1	1	1	1	1	1
Fluorosilic acid	1696-1-83-4	1	1	1	1	1	1	1	1	1	1	1
Fluorosulfonic acid	7789-21-1	1	1	1	1	2	1	1	1	1	1	1
Formaldehyde gas	50-00-0	1	1	1	1	1	1	1	1	1	1	1
Formaldehyde, 30–70%	50-00-0	5	2	4	5	2	2	3	5	5	5	5
Formamide	75-12-7	1	1	4	1	1	1	1	1	1	1	1
Formic acid	64-18-6	1	2	5	5	2	2	4	1	1	5	3
Formic acid >70 %	64-18-6	5	2	5	3	2	2	4	3	5	5	3
Freon 12	75-71-8	1	1	2	1	1	1	1	1	1	1	1
Freon 113	76-13-1	2	2	3	5	2	4	2	4	1	1	4
Freon TMC		2	2	2	2	1	4	2	1	1	1	1
Furan	110-00-9	2	2	2	2	1	3	2	2	1	1	1
Furfural	98-01-1	5	2	2	2	1	4	2	3	5	5	5
Furfuryl alcohol	98-00-0	1	1	1	1	1	2	2	1	1	5	5
Fusilade 250EC	6980-6-50-4	1	2	2	4	1	1	2	1	1	1	5
Glutaraldehyde, 30–70%	8006-61-9	5	3	5	4	1	2	4	5	1	5	4
Glutaraldehyde <30 %	8006-61-9	5	4	5	5	5	2	4	5	5	5	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Glycerol	111-30-8	5	5	5	5	5	1	1	5	5	5	5
Glycerol monothioglycolate, >70%	6814-8-42-5	1	1	1	1	1	1	1	1	1	1	4
Glycerol propoxy triacrylate	5459-38-1	1	2	2	2	1	1	1	1	1	1	4
Glycidyl methacrylate	106-91-2	1	1	1	1	1	1	1	1	1	1	4
Glycolic acid, sat.	79-14-1	1	1	1	1	1	1	1	1	1	1	1
Guthion	86-50-0	1	3	5	5	1	1	3	1	1	1	1
Halothane	151-67-7	3	2	2	2	1	5	2	2	1	1	1
n-Heptane	142-82-5	2	2	2	5	1	5	2	5	5	5	5
4-Heptanone	123-19-3	3	2	2	2	1	1	1	2	1	1	1
Hexachloro-1,3-butadiene	87-68-3	1	1	1	1	1	1	1	1	1	1	1
Hexachlorocyclopentadiene	77-47-4	5	2	2	5	1	5	2	5	1	1	1
1,1,1,3,3,3-Hexachloropropane	3607-78-1	1	1	1	1	1	1	1	1	1	1	1
Hexafluoroethane	76-16-4	1	1	1	1	1	1	1	1	1	1	1
Hexafluoroisobutylene	382-10-5	1	1	1	1	1	1	1	1	1	1	1
Hexamethyldisiloxane	107-46-0	1	1	4	4	1	5	1	1	1	5	1
1,1,1,3,3,3-Hexamethyldisilazane	999-97-3	4	2	2	5	1	4	2	5	5	5	4
Hexamethylene-1,6-diisocyanate	822-06-0	5	1	3	1	5	1	2	1	5	1	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Hexamethylphosphoramide	680-31-9	3	1	1	2	2	1	1	1	1	1	1
n-Hexane	110-54-3	2	2	2	5	2	5	2	5	5	5	5
1,6-Hexanediamine	124-09-4	5	2	5	3	1	1	1	1	1	1	1
1,6-Hexanediamine, 30–70%	124-09-4	5	3	5	5	1	1	1	1	1	1	1
1,6-Hexanediol diacrylate	1304-8-33-4	5	2	2	4	1	1	1	1	1	1	1
3-Hexanone	589-38-8	3	2	2	2	1	1	1	2	1	1	1
1-Hexene	592-41-6	2	2	2	3	1	1	2	5	1	1	1
Hexyldiglycol	112-59-4	5	1	4	4	1	1	3	5	1	1	1
Hexyl glycol	1559-35-9	5	1	4	4	1	1	3	5	1	1	1
Hydrazine	302-01-2	5	3	5	5	1	2	5	2	4	1	4
Hydrazine 30–70%	302-01-2	5	3	5	5	1	2	5	4	5	5	1
Hydrazine hydrate 30–70%	7803-57-8	5	1	5	5	1	1	1	5	1	1	1
Hydriodic acid, 30–70%	1003-4-85-2	1	1	1	1	1	1	1	1	1	1	1
Hydrobromic acid, 30–70%	1003-5-10-6	1	4	4	4	1	4	2	1	1	5	1
Hydrochloric acid, 37%	7647-01-0	5	4	5	4	3	2	4	5	5	5	4
Hydrochloric acid, <30%	7647-01-0	5	5	5	5	3	2	4	5	5	5	4
Hydrofluozirconic acid	1202-1-95-3											
Hydrofluoric acid, 30–70%	7664-39-3	1	5	5	5	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Hydrogen bromide	1003-5-10-6	1	1	1	1	1	1	1	1	1	1	1
Hydrogen chloride	7647-01-0	5	1	5	3	2	1	3	5	5	1	4
Hydrogen cyanide	74-90-8	3	2	5	5	2	1	2	1	1	5	4
Hydrogen cyanide gas	74-90-8	1	1	1	1	1	1	1	1	1	1	1
Hydrogen fluoride	7664-39-3	2	2	3	2	2	2	2	3	3	5	2
Hydrogen peroxide, 30–70%	7722-84-1	5	5	5	5	5	2	4	5	1	1	4
Hydrogen selenide	7783-07-5	1	1	1	1	1	1	1	1	1	1	1
Hydrogen sulfide	7783-06-4	1	1	1	1	1	1	1	1	1	1	1
Hydrogentrichlorosilane	1337-75-79-8	2	2	2	2	1	1	1	4	1	1	4
Hydroquinone	123-31-9	4	2	4	4	1	2	2	1	1	1	4
2-Hydroxyethyl acrylate	818-61-1	2	2	4	2	1	1	1	5	1	1	4
2-Hydroxyethyl methacrylate	868-77-9	1	1	4	1	1	1	1	1	1	1	4
2-Hydroxyethyl-N,N,N-trimethyl ammonium hydroxide	62-49-7	1	1	1	1	1	1	1	1	1	1	5
4-Hydroxy-4-methyl-2-pentanone	123-42-2	5	2	3	3	1	3	2	2	1	5	4
Hypophosphorus acid, 30–70%	6303-21-5	1	5	5	5	1	1	1	1	1	1	1
3,3'-Iminobis (propylamine)	56-18-8	5	2	5	2	1	2	2	5	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Iodine, solid	7553-56-2	5	1	5	5	4	1	1	5	1	1	1
1-Iododecane	2050-77-3	1	1	1	4	1	1	1	1	1	1	1
beta-Ionone	79-77-6	5	2	2	5	1	5	2	5	1	1	1
Isobutane	75-28-5	1	1	1	1	1	1	1	1	1	1	1
Isobutanol	78-83-1	5	2	5	4	1	2	2	5	5	5	4
Isobutyl acrylate	106-63-8	5	2	2	2	1	5	2	2	1	1	1
Isobutylamine	78-81-9	2	2	2	2	1	2	2	2	1	1	2
Isobutylbenzene	538-93-2	1	1	1	1	1	1	1	1	1	1	1
Isobutylnitrite	542-56-3	2	1	1	2	1	1	2	2	1	1	1
Isobutyraldehyde	78-84-2	5	2	2	2	1	2	1	2	1	1	1
Isobutyronitrile	78-82-0	1	2	1	1	1	1	1	1	1	1	1
Isooctane	2663-5-64-3	2	2	3	5	1	4	2	5	5	5	1
Isopentyl acetate	123-92-2	3	2	2	2	2	1	2	2	1	1	1
Isopentyl alcohol	123-51-3	5	1	5	5	1	1	3	5	1	1	1
Isopentylnitrite	110-46-3	2	2	2	3	1	5	2	2	1	1	1
Isophorone	78-59-1	5	2	3	3	1	5	2	3	1	1	4
Isophorone diisocyanate	4098-71-9	5	3	1	5	1	5	1	5	1	5	1
Isoprene	78-79-5	1	2	2	2	1	5	1	4	5	1	1
Isopropanolamine	78-96-6	5	1	5	1	1	1	5	5	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinylalcohol (PVAL)	Polyvinylchloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Isopropylacetate	108-21-4	3	2	2	2	1	1	1	2	1	1	1
Isopropanol	67-63-0	5	2	5	5	2	2	3	5	5	5	5
Isopropylamine	75-31-0	3	2	2	2	1	1	2	2	1	5	1
Isopropyl ether	108-20-3	1	2	2	1	1	1	2	1	1	1	1
Isopropyl methacrylate	4655-34-9	5	2	2	2	1	5	2	2	1	1	1
Isopropylnitrite	1712-64-7	1	1	1	1	1	1	1	1	1	1	4
Isovaleraldehyde	590-86-3	1	2	1	1	1	1	1	1	1	1	1
Lactic acid, >70%	50-21-5	5	5	5	5	1	3	5	5	1	5	1
Lauric acid, 30–70 %	143-07-7	5	4	5	5	4	2	2	5	1	1	1
Lewsite (CW Agent L)	541-25-3	1	1	1	1	1	1	1	1	1	5	1
d,-Limonene	5989-27-5	2	2	2	5	1	5	2	5	5	5	4
Lithium chloride, <30%	7447-41-8	1	1	1	1	5	1	1	1	1	1	1
Lithium hydroxide, <30%	1310-65-2	1	1	1	1	5	1	1	1	1	1	1
Malathion	121-75-5	1	1	1	1	1	1	1	1	1	1	4
Malathion, 30–70%	121-75-5	1	1	1	1	1	1	1	1	1	1	4
Maleic acid	110-16-7	5	4	5	5	1	2	4	5	1	1	1
Maleic anhydride	108-31-6	1	1	1	1	1	1	1	1	1	1	1
Mercaptoacetic acid	68-11-1	5	2	5	2	1	2	2	5	1	1	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
2-Mercaptoethanol	60-24-2	5	2	3	2	1	1	1	5	1	1	4
Mercuric chloride, sat.	7487-94-7	1	1	1	1	1	1	1	1	1	1	1
Mercury	7439-97-6	5	5	5	5	1	1	5	5	5	1	5
Mesityl oxide	141-79-7	1	1	1	1	1	1	1	1	1	1	1
Methacrylic acid	79-41-4	5	2	3	2	1	2	2	5	5	1	5
Methacrylonitrile	126-98-7	5	2	1	2	1	2	2	2	1	1	1
Methane	74-82-8	1	1	1	1	1	1	1	1	1	1	1
Methanesulfonic acid	75-75-2	1	1	4	1	1	1	4	1	1	1	1
Methanesulfonyl chloride	124-63-0	1	1	3	1	1	1	2	1	1	1	1
Methanol	67-56-1	5	2	3	2	2	2	2	3	3	5	3
Methomyl®, <30%	1675-2-77-5	1	1	1	1	2	1	1	1	1	1	1
1-Methoxy-2-propylacetate	108-65-6	5	2	2	3	1	4	2	3	4	5	4
(2-Methoxymethylethoxy) propanol	3459-0-94-8	1	1	4	4	1	1	1	1	1	1	1
4-Methoxy-4-methyl-2-pentanone	107-70-0	5	2	2	2	1	5	2	2	1	1	1
1-Methoxy-2-propanol	107-98-2	5	2	4	4	1	2	3	3	5	5	4
Methyl acetate	79-20-9	3	2	2	2	1	2	2	2	1	1	5
Methyl acrylate	96-33-3	3	2	2	2	1	3	2	2	3	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Methylacrylic acid	79-41-4	5	2	3	2	1	2	2	5	5	1	5
Methylamine gas	74-89-5	1	2	1	1	1	2	2	1	1	2	1
Methylamine, 30–70%	74-89-5	5	2	4	5	1	2	3	5	5	5	4
3-Methylamino-propylamine	6291-84-5	5	2	2	2	1	2	2	2	1	1	1
Methyl bromide	74-83-9	4	3	4	1	2	1	2	1	1	1	1
Methyl chloride gas	74-87-3	5	2	3	4	2	1	2	5	5	1	1
Methyl chloroacetate	96-34-4	5	2	2	2	1	1	1	2	1	1	1
Methyl chlorformate	79-22-1	1	2	1	1	1	1	1	1	2	1	1
Methyldichloro-silane	75-54-7	2	2	2	2	1	1	1	4	1	1	4
Methyldiglycol	111-77-3	5	3	4	3	1	1	3	5	1	1	1
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1	1	1	1	1	1	1	1	1	1	4
4,4'-Methylene bis (cyclohexylar-nine)	1761-71-3	1	1	1	1	1	1	1	1	1	1	1
Methylene bisphenyl-4,4'-diisocyanate	101-68-8	5	1	1	1	1	1	1	5	1	1	5
Methylene bromide	74-95-3	2	2	2	2	1	4	2	4	4	5	1
Methylene chloride	75-09-02	2	2	2	2	2	5	2	3	2	2	5
4,4'-Methylenedia-niline	101-77-9	5	1	5	2	2	1	1	5	1	1	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
N-methylethanolamine	109-83-1	5	2	5	1	1	1	1	5	1	1	1
Methyl ethyl ketoxime	96-29-7	1	1	1	1	1	1	1	1	1	1	1
Methyl ethyl ketone	78-93-3	4	2	2	2	2	2	2	2	2	5	5
Methyl eugenol	93-15-2	5	2	2	1	1	1	1	5	1	1	1
N-Methylformamide	123-39-7	1	1	1	1	1	1	1	1	1	1	1
Methyl formate	107-31-3	3	2	2	2	1	1	1	2	1	1	1
Methyl fluoride	593-53-3	1	1	1	1	1	1	1	1	1	1	1
2-Methylglutaronitril, >70%	4553-62-2	1	1	1	1	1	1	1	1	1	1	1
Methyl glycol	109-86-4	5	2	2	2	1	2	2	2	5	5	4
Methyl glycol acetate	110-49-6	5	2	2	2	1	2	2	2	1	1	4
5-Methyl-2-hexanone	110-12-3	1	1	1	1	1	1	1	1	1	1	5
Methylhydrazine	60-34-4	3	2	1	2	2	2	2	2	2	2	2
Methyl iodide	74-88-4	2	2	2	2	2	5	2	5	1	1	1
Methyl isobutyl ketone	108-10-1	4	2	2	2	1	4	2	2	2	5	5
Methyl isocyanate	624-83-9	2	2	2	2	2	5	2	2	2	1	5
Methyl mercaptan	74-93-1	1	1	1	1	1	1	1	1	1	1	1
N-Methylmethacrylamide	3887-02-3	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Methyl methacrylate	80-62-6	3	2	2	2	2	5	2	2	2	5	5
Methyl 3-methoxypropionate	3852-09-3	1	1	1	2	1	1	1	1	1	1	1
4-Methyl-4-oxide-morpholine	7529-22-8	1	2	2	2	1	1	1	1	1	1	1
Methylnadic anhydride	2513-4-21-8	1	1	1	1	1	1	1	1	1	1	4
Methyl parathion	298-00-0	1	1	1	1	2	1	1	1	1	1	1
2-Methylpentamethylenediamine	1552-0-10-2	1	1	4	1	1	1	1	1	1	1	1
Methyl pentyl ketone	110-43-0	3	2	2	1	1	1	1	2	2	5	4
N-Methyl-2-pyrrolidone	872-50-4	5	2	2	2	1	2	2	2	2	5	5
Methyl salicylate	119-36-8	1	1	1	1	2	1	1	1	1	1	1
alpha-Methylstyrene	98-83-9	2	2	2	2	1	3	1	5	1	1	1
Methyltrichlorosilane	75-79-6	2	2	2	3	1	1	1	4	1	1	4
Methyltriglycol	112-35-6	5	1	4	3	1	1	3	1	1	1	1
Methyl vinyl ether	107-25-5	1	2	1	1	1	1	1	1	1	1	1
Methyl vinyl ketone	78-94-4	4	1	2	1	1	1	2	1	1	1	1
Morpholine	110-91-8	5	2	2	2	1	3	2	2	3	5	5
Mustard gas	505-60-2	4	1	1	1	1	1	1	1	5	1	1
Naphtha, <3% aromatics, 150–200°C	6474-1-65-7	2	2	3	5	2	4	3	5	5	5	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinylchloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Naphtha, 10–15% aromatics, 120–140°C	8030-30-6	2	2	3	5	2	4	3	5	5	5	5
Naphtha, 15–20% aromatics, 150–200°C	8052-41-3	2	2	2	4	1	4	2	5	5	5	1
Naphthalene	91-20-3	2	2	2	2	1	1	2	1	1	1	1
Nickel carbonyl	1346-3-39-3	1	1	1	1	1	1	1	1	1	1	1
Nickel subsulfide	11113-75-0	1	1	5	1	1	1	1	1	1	1	1
Nicotine	54-11-5	1	1	1	3	1	1	1	1	1	1	4
Nitric acid, red fuming	8007-58-7	1	2	2	2	2	2	2	2	3	5	2
Nitric acid. >70%	7697-37-2	4	2	4	2	2	2	2	4	1	5	3
Nitric acid, 30–70%	7697-37-2	5	2	5	2	4	2	3	5	5	5	4
Nitric acid, <30%	7697-37-2	5	5	5	3	4	2	5	5	5	5	4
Nitric oxide	1010-2-43-9	1	1	1	1	1	1	1	1	1	1	1
Nitrobenzene	98-95-3	5	2	2	2	2	5	2	5	5	5	5
4-Nitrodiphenylamine	836-30-6	1	1	1	1	1	1	1	1	1	1	4
Nitroethane	79-24-3	5	2	2	2	1	3	2	2	1	1	5
Nitrogen dioxide	1010-2-44-0	1	1	1	1	1	1	2	1	1	1	1
Nitrogen tetroxide	1054-4-72-6	3	2	2	2	1	2	2	1	1	1	1
Nitrogen trifluoride	7783-54-2	1	1	1	1	1	1	1	1	1	1	1
Nitroglycerol	55-63-0	1	1	1	1	1	1	1	1	1	1	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinyl chloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Nitroglycol	628-96-6	1	1	1	1	1	1	1	1	1	1	4
Nitromethane	75-52-5	5	2	2	2	1	4	2	2	5	5	5
1-Nitropropane	108-03-2	5	2	2	2	1	5	2	2	1	1	1
2-Nitropropane	79-46-9	5	2	2	2	1	5	2	2	3	5	4
N-Nitrosodiethylamine	55-18-5	4	2	1	2	1	1	1	1	1	1	4
N-Nitrosodimethylamine	62-75-9	1	2	2	2	1	2	2	2	1	1	1
2-Nitrotoluene	88-72-2	5	2	1	2	1	1	2	1	1	1	1
4-Nitrotoluene	99-99-0	1	2	2	1	2	1	2	1	1	1	1
Nitrous oxide	1002-4-97-2	1	1	1	1	1	1	1	1	1	1	1
Nonylamine	112-20-9	1	1	1	1	1	1	1	1	1	1	1
Nonylphenol	2515-4-52-3	1	1	5	4	1	1	1	1	1	1	1
n-Octane	111-65-9	2	2	3	5	1	1	2	5	1	1	1
n-Octanol	111-87-5	5	2	3	5	1	4	3	5	1	1	1
Oleic acid	112-80-1	5	4	3	5	1	3	3	5	1	1	1
Oleyl amino ethoxylate	2663-5-93-8	1	1	5	5	1	1	1	1	1	1	1
Orthocid 83®	133-06-2	1	1	1	1	1	1	1	1	1	1	4
Oxalic acid. sat. soL	144-62-7	5	5	5	5	1	2	5	5	1	1	5
Oxalic acid, <30%	144-62-7	5	5	5	5	1	2	5	5	1	1	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
4,4' -Oxidianiline	101-80-4	1	1	1	1	3	1	1	1	1	1	1
Palmitic acid	57-10-3	5	2	5	2	1	2	3	1	1	1	1
Paraphenylene diisocyanate, crude	104-49-4	1	1	1	1	1	1	1	1	1	1	1
Pentachloro-phenol	87-86-5	1	2	4	5	1	2	3	5	1	1	5
n-Pentane	109-66-0	2	2	2	5	2	4	2	5	1	5	5
2,4-Pentanedione	123-54-6	1	2	1	1	1	1	1	1	1	1	1
n-Pentanol	71-41-0	5	2	4	5	1	4	2	5	5	5	1
2-Pentanone	107-87-9	4	2	2	2	1	1	2	2	1	5	1
n-Pentene	109-67-1	1	2	1	1	1	1	1	1	1	1	1
cis-2-Pentenenitrile, >70%	2589-9-50-7	4	1	1	1	1	1	1	1	1	1	1
2-Pentenenitrile	1328-4-42-9	1	1	1	1	1	1	1	1	1	1	1
3-Pentenenitrile	4635-87-4	1	1	1	1	1	1	1	1	1	1	1
2-Pentanone	107-87-9	4	2	2	2	1	1	2	2	1	5	1
n-Pentyl acetate	628-63-7	3	2	2	2	1	4	2	2	2	5	1
n-Pentylarnine	110-58-7	3	2	2	2	1	1	2	2	1	1	1
Pentyltrichloro-silane	107-72-2	1	2	1	1	1	1	1	1	1	1	1
Perchloric acid, 30–70%	7601-90-3	5	5	5	5	1	2	5	1	1	1	4
Perchloroethy-lene	127-18-4	2	2	2	4	2	5	2	5	5	5	5
Peroxyacetic acid	79-21-0	5	2	4	2	1	2	2	4	1	5	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Petroleum ethers, 80–110°C	8032-32-4	2	2	2	5	2	1	2	5	1	1	5
1-Phenylethanol	98-85-1	1	1	1	1	1	1	1	1	1	1	1
2-Phenylethanol	60-12-8	1	1	1	1	1	1	1	1	1	1	1
Phenol, >70%	108-95-2	5	2	3	2	2	1	1	2	1	1	1
Phenolphthalein	77-09-8	1	4	4	4	1	1	4	1	1	1	1
Phenolsulfonic acid	1333-39-7	1	1	5	3	1	1	1	1	1	1	1
Phenyl mercaptan	108-98-5	1	1	1	1	1	1	1	1	1	1	5
Phenyl glycidyl ether	122-60-1	1	1	1	1	1	1	1	1	1	1	1
Phosgene	75-44-5	1	1	2	1	1	1	1	1	4	1	1
Phosphine	7803-51-2	1	2	2	1	2	1	2	1	1	1	1
Phosphoric acid, >70%	7664-38-2	5	5	5	5	5	2	5	5	5	5	5
Phosphorus oxychloride	1002-5-87-3	3	2	2	2	2	1	2	2	1	1	4
Phosphorus tribromide	7789-60-8	1	1	1	1	1	1	2	1	1	1	1
Phosphorus trichloride	7719-12-2	2	1	2	1	1	1	2	1	3	1	1
Phthalic acid anhydride	85-44-9	1	1	1	1	1	1	1	1	1	1	4
o-Phthaldehyde, 30–70%	643-79-8	1	1	5	1	1	1	1	1	1	1	1
alpha-Picoline	109-06-8	1	1	1	1	1	1	1	1	1	1	1
beta-Picoline	108-99-6	1	2	2	2	1	1	2	2	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Picric acid	88-89-1	1	2	3	3	1	2	2	1	1	1	1
Piperazine	110-85-0	3	2	2	2	1	1	2	2	1	1	1
Piperidine	110-89-4	2	2	2	1	1	2	1	1	1	1	1
Polychlorinated biphenyls	1336-36-3	5	2	5	3	2	1	5	5	1	5	5
Polyethylene glycol	2532-2-68-3	1	1	1	1	1	1	1	1	1	1	5
Polymethylene polyphenyl isocyanate	9016-87-9	1	1	1	1	1	1	1	1	1	1	1
Potassium acetate, sat.	127-08-2	1	1	1	1	1	1	1	1	1	1	1
Potassium carbonate	584-08-7	1	1	1	1	1	1	1	1	1	1	1
Potassium chromate, sat.	7789-00-6	1	1	1	1	1	1	1	1	1	1	1
Potassium cyanide	151-50-8	1	1	1	1	5	1	1	1	1	1	1
Potassium fluoride, 30–70%	7789-23-3	1	1	1	5	1	1	1	1	1	1	1
Potassium hydroxide, 30–70%	1310-58-3	5	5	5	5	1	2	5	5	5	5	5
Potassium iodide	7681-11-0	1	5	5	5	1	1	1	1	1	1	1
Potassium permanganate, sat.	7722-64-7	1	1	1	1	5	1	1	1	1	1	1
Pramitol	1610-18-0											
Promethazine hydrochloride	58-33-3	5	5	5	1	1	1	5	1	1	1	1
Propane gas	74-98-6	1	1	5	5	1	1	2	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
1,3-Propanediamine	109-76-2	5	2	3	2	1	2	2	2	1	1	1
n-Propanol	71-23-8	5	2	4	4	1	2	3	5	5	5	4
beta-Propiolactone	57-57-8	1	2	1	1	2	1	1	1	1	1	1
Propionaldehyde	123-38-6	5	2	2	2	2	2	1	2	1	1	1
Propionic acid	79-09-4	4	1	3	2	2	1	2	1	1	3	1
Propionitrile	107-12-0	2	2	1	2	1	5	2	2	1	1	1
Propiophenone	93-53-0	1	1	1	1	1	1	1	1	1	1	4
1-Propoxy-2-propanol	1569-01-3	5	2	3	3	1	1	3	5	1	1	1
n-Propyl acetate	109-60-4	3	2	2	2	1	3	2	2	2	1	5
n-Propylamine	107-10-8	2	2	2	5	1	5	2	5	1	1	1
Propyldiglycol	6881-94-3	5	1	4	3	1	1	3	5	1	1	1
Propylenediamine	78-90-0	5	1	5	1	1	2	2	5	1	1	1
Propylene glycol	57-55-6	5	4	5	5	1	1	1	5	1	1	4
1,2-Propylene oxide	75-56-9	2	2	2	2	2	2	2	2	2	5	4
Propyl glycol	2807-30-9	4	1	4	4	1	1	3	5	1	1	1
Propyl methacrylate	2210-28-8	3	2	2	2	1	5	2	2	1	1	1
Propyzamide, <30%	2395-0-58-5	1	1	1	1	1	1	1	1	1	1	4
Pyridine (Azine)	110-86-1	3	2	2	2	2	2	2	2	2	5	5
Pyrrolidine	123-75-1	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Quinoline	91-22-5	1	1	1	1	1	1	1	1	1	1	4
Sarin	107-44-8	1	1	1	1	1	1	1	1	1	5	1
Sevin 50W	63-25-2	1	4	4	4	1	1	4	1	1	1	1
Silicon tetrachloride	1002-6-04-7	2	2	2	2	1	1	2	5	1	1	4
Silane	7803-62-5	1	1	1	1	1	1	1	1	1	1	1
Silicon tetrachloride	1002-6-04-7	2	2	2	2	1	1	2	1	3	1	1
Silver cyanide, <30%	506-64-9	1	1	1	1	1	1	1	1	1	1	4
Sodium carbonate	497-19-8	1	5	5	5	1	1	1	1	1	1	1
Sodium chloride, sat.	7647-14-5	1	5	5	5	1	1	1	1	1	1	1
Sodium cyanide, solid	143-33-9	1	5	5	5	1	1	5	1	1	1	1
Sodium cyanide, 30—70%	143-33-9	1	1	1	1	1	1	1	1	1	1	1
Sodium cyanide,sat. solution	143-33-9	1	1	1	1	1	1	1	1	1	1	1
Sodium dichromate, <30%	1058-8-01-9	1	1	1	1	5	1	1	1	1	1	1
Sodium fluoride, sat.	7681-49-4	1	5	5	5	1	1	5	1	1	1	1
Sodium hydrogen sulfide	1672-1-80-5	1	1	1	1	1	1	1	1	1	1	1
Sodium hydroxide, sat	1310-73-2	1	1	1	1	5	1	1	1	1	1	1
Sodium hydroxide, 30–70%	1310-73-2	5	5	5	5	5	2	5	5	5	5	5

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Sodium hydroxide, >70%	1310-73-2	1	1	5	1	1	1	5	1	1	1	1
Sodium hypochlorite, 30–70%	7681-52-9	5	5	5	5	5	1	5	5	1	1	5
Sodium methylate, 30–70%	124-41-4	1	1	1	1	1	1	1	1	1	1	1
Sodium thiosulfate	7772-98-7	5	5	5	5	1	1	5	5	1	1	1
Styrene	100-42-5	2	2	2	2	2	4	2	5	4	5	5
Sulfallate	95-06-7	5	1	4	5	1	1	1	5	1	1	1
Sulfamic acid, <30%	5329-14-6	1	1	1	1	5	1	1	1	1	1	1
Sulfur dichloride	1054-5-99-0	1	1	1	1	1	1	1	1	1	1	1
Sulfur dichloride	1054-5-99-0	1	2	2	1	1	1	1	1	1	1	1
Sulfur dioxide	7446-09-5	4	1	4	1	2	1	1	1	5	1	1
Sulfur hexafluoride	2551-62-4	1	1	1	1	1	1	1	1	1	1	1
Sulfuric acid, fuming	8014-95-7	3	2	3	2	3	2	2	4	5	1	1
Sulfuric acid, >70%	7664-93-9	5	2	3	2	4	2	3	5	5	5	5
Sulfuric acid, 30–70%	7664-93-9	5	5	5	3	5	2	5	5	5	5	5
Sulfuric acid, <30%	7664-93-9	5	5	5	4	5	2	5	5	5	5	5
Sulfur monochloride	1002-5-67-9	1	1	1	1	1	1	1	1	1	1	1
Sulfur trioxide	7446-11-9	2	1	1	1	1	1	2	1	1	1	1
Sulfuryl chloride	7791-25-5	2	1	1	1	1	1	2	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Tannic acid	1401-55-4	5	4	5	4	1	2	5	5	1	1	1
1,2,4,5-Tetrachlorobenzene	95-94-3	1	1	1	5	1	5	2	1	1	1	1
1, I ,2,2-Tetrabromoethane	79-27-6	1	1	1	1	1	1	1	1	1	1	1
2,2' ,6,6'-Tetrachloro bisphenol A	79-95-8	1	1	1	1	1	1	1	1	1	1	1
1,1,1,2-Tetrachloroethane	630-20-6	2	2	2	2	2	5	2	5	1	1	1
1,1,2,2-Tetrachloroethane	79-34-5	2	2	2	2	2	5	2	5	1	1	1
Tetraethoxysilane	78-10-4	1	1	1	5	1	1	1	1	1	1	1
Tetraethylenepentamine	112-57-2	5	3	5	1	1	1	2	5	1	1	1
Tetraethyl Lead (TEL)	78-00-2	1	1	1	1	1	1	1	1	1	1	1
1,1,1,2-Tetrafluoroethane	811-97-2	1	1	1	1	1	1	1	1	1	1	1
Tetrafluorethylene	116-14-3	5	1	5	1	1	5	1	5	1	1	1
Tetrafluormethane	75-73-0	1	1	1	1	1	1	1	1	1	1	1
Tetrafluoroboric acid, 30–70%	1687-2-11-0	5	1	5	4	1	1	1	5	5	1	4
Tetrahydrofuran (THF)	109-99-9	2	2	2	2	2	3	2	2	2	5	5
Tetrahydrothiophene	110-01-0	1	2	2	2	1	5	1	1	1	5	1
alpha-Tetralone	529-34-0	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Tetramethyl ammonium hydroxide	75-59-2	1	1	1	5	1	1	1	1	1	5	5
N,N,N',N'-Tetramethylenediamine	110-18-9	2	2	2	2	1	1	2	5	5	1	4
Tetramethylethylene oxide	5076-20-0	1	1	1	1	1	1	1	1	1	1	1
Thiocarbamide, <30%	62-56-6	1	1	1	1	1	1	1	1	1	1	4
Thionyl chloride	7719-09-7	1	2	2	2	1	1	2	1	4	5	1
Thiophene	110-02-1	2	2	2	2	1	3	2	5	1	1	1
Titanium tetrachloride	7550-45-0	1	1	4	1	1	1	2	1	1	1	1
Toluene	108-88-3	2	2	2	2	2	5	2	5	4	5	5
Toluene-2,4-diisocyanate	584-84-9	5	2	2	2	2	5	2	5	5	5	5
Toluene-2,4-diisocyanate > 70%	584-84-9	5	2	2	2	2	5	2	5	5	5	5
Toluene-2,6-diisocyanate	2647-1-62-5	1	2	2	2	2	1	2	1	1	1	1
p-Toluenesulfonic acid	104-15-4	1	1	4	1	1	1	5	1	1	1	1
m-Toluidine	108-44-1	1	1	1	1	1	1	1	1	1	1	1
o-Toluidine	95-53-4	5	1	3	1	2	1	2	5	5	1	5
Trefian EC	1582-09-8	1	2	2		1	1	2	1	1	1	1
Triallylarnine	102-70-5	2	2	2	5	1	1	2	5	5	5	1
Tribromomethane	75-25-2	3	2	2	2	1	5	2	5	5	5	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinylchloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
2,4,6-Tribromophenol	118-79-6	1	1	1	1	1	1	1	1	5	1	1
Tributyl phosphate	126-73-8	1	1	1	1	1	1	1	1	1	1	4
Tributyltin oxide (Bis(tributyltin) oxide)	56-35-9											
Trichloroacetaldehyde	95-87-6	2	2	2	2	1	5	2	4	1	1	1
Trichloroacetic acid	76-03-9	1	1	1	4	1	1	1	1	5	1	1
1,1,3-Trichloroacetone	921-03-9	1	1	1	1	1	1	1	1	1	1	1
Trichloroacetonitrile	545-06-2	2	2	2	2	1	5	2	2	1	1	1
1,2,4-Trichlorobenzene	120-82-1	2	2	2	2	2	2	2	4	5	1	1
1,1,1-Trichloroethane	71-55-6	2	2	2	2	2	5	2	5	5	5	5
1,1,2-Trichloroethane	79-00-5	2	2	2	2	2	4	2	5	1	1	1
2,2,2-Trichloroethanol	115-20-8	1	1	1	1	2	1	1	1	1	1	1
Trichloroethylene	79-01-6	2	2	2	2	2	5	2	5	3	5	5
Trichlorophenylsilane	98-13-5	1	1	1	1	1	1	1	1	1	1	1
1,2,3-Trichloropropane	96-18-4	5	1	1	2	1	5	1	5	1	1	1
Trichlorosilane	1002-5-78-2	1	1	1		1	1	1	1	1	1	1
Tricresyl phosphate	95-95-4	5	2	4	4	1	5	5	5	1	1	1
Triethanolamine	102-71-6	5	3	4	4	1	1	4	5	5	1	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Triethanolamine >70%	102-71-6	5	4	4	5	1	5	5	5	5	1	4
Triethoxysilane	998-30-1	1	1	1	1	1	1	1	1	1	1	1
Triethylamine	121-44-8	2	2	2	5	1	5	2	5	5	5	1
Triethylenediamine	280-57-9	1	1	1	1	1	1	1	1	1	1	5
Triethylenetetraamine	112-24-3	5	2	5	5	1	1	2	5	5	1	4
Trifluoroacetic acid	76-05-1	1	1	5	1	1	1	2	1	1	1	4
Trifluoroacetyl chloride	354-32-5	1	1	1	1	1	1	1	1	1	1	1
2.2,2-Trifluorethanol	75-89-8	1	3	3	2	2	1	2	4	1	1	1
Trifluoromethane	75-46-7	1	1	1	1	1	1	1	1	1	1	1
Trifluoromethanesulfonic acid	1493-13-6	2	2	2	2	1	1	1	5	1	1	1
Trifluoromethylbenzene	98-08-8	1	2	2	3	1	4	2	3	1	5	1
m-Trifluoromethylphenol	98-17-9	1	1	5	3	1	1	1	1	1	1	1
Trimethylamine gas	75-50-3	2	1	1	1	1	1	1	1	1	1	1
1,2,3-Trimethylbenzene, >70%	526-73-8	1	1	1	1	1	1	1	1	1	1	1
Trimethylolpropane triacrylate	1562-5-89-5	5	4	1	5	1	1	1	1	1	1	1
Trimethyl phosphate	512-56-1	1	1	1	2	1	1	2	2	1	1	1
Trimethyl phosphite	121-45-9	1	1	1	1	1	1	1	1	1	1	1
Triphenyl phosphite	101-02-0	1	1	1	1	1	1	1	1	1	1	1

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (PE)	Polyvinyl alcohol (PVAL)	Polyvinyl chloride (PVC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Tri-n-propylamine	102-69-2	2	2	5	5	1	5	2	5	1	1	1
Tripropylene glycol diacrylate	4297-8-66-5	1	1	1	1	1	1	1	1	1	1	4
Tris (1.3-dichloroisopropyl) phosphate	126-72-7	1	1	1	5	1	1	1	1	1	1	1
Tungsten hexafluoride	7783-82-6	1	1	1	1	1	1	1	1	1	1	1
Turpentine	8006-64-2	2	2	2	3	1	4	2	5	5	5	5
Undecane	1120-24-4	1	1	1	5	1	1	1	1	1	1	1
Valeronitrile	110-59-8	5	2	2	2	1	5	2	2	1	1	1
Vrnyl acetate	108-05-4	3	2	2	2	1	1	2	2	3	5	5
Vinyl bromide	593-60-2	1	1	1	1	1	1	1	1	1	1	1
Vinyl chloride gas	75-01-4	2	2	2	4	1	1	2	4	5	5	5
4-Vinyl-1-cyclohexane	100-40-3	2	1	1	4	1	3	1	5	1	1	1
Vinyl fluoride	75-02-5	2	1	1	1	1	1	1	1	1	1	1
Vinylmagnesium chloride, <30%	3536-96-7	1	1	1	1	1	1	1	1	1	1	1
Vinylidene chloride	75-35-4	2	2	2	2	1	4	2	2	1	5	5
Vinylidene fluoride	75-38-7	5	2	2	1	1	1	2	5	1	1	1
4-Vinylpyridine	100-43-6	1	1	1	1	1	1	1	1	1	1	1
N-Vinylpyrrolidone	88-12-0	1	2	2	2	1	2	2	1	2	5	4

Chemical name	CAS #	Butyl rubber	Natural rubber (Latex)	Neoprene rubber	Nitrile rubber	Polyethylene (P-E)	Polyvinyl alcohol (P-VAL)	Polyvinylchloride (P-VC)	Viton®	Viton®/Butyl rubber	Barrier® (PE/PA/PE)	Silvershield/4H® (PE/EVAL/PE)
Vinyltrichlorosilane	75-94-5	2	2	2	2	1	1	1	4	1	1	4
Water	7732-18-5	5	4	5	5	1	2	1	5	1	1	5
Xylene	1330-20-7	2	2	2	2	2	5	2	5	5	5	5
Xylenesulphonic acid sodium salt, 30–70%	1300-72-7	1	5	5	1	1	1	5	1	1	1	1
Xylenol	1300-71-6	1	2	1	1	1	1	1	1	1	1	1

- Reference: Forsberg. K. Mansdorf S. Z. Quick selection guide to chemical protective clothing, 5th edition 2007
- Reference: Glove manufacture permeation guides

6 Appendix 2: Cartridges/filters for respiratory protection

0016336211

Protection from different air pollutants

	US standard		EU standard	
Reference	**Colour code**	**Main application**	**Type/colour code**	**Main application**
Gas and vapour EU: (EN 141, EN149, EN405, EN371) US: NIOSH	White	Acid gas (for example, sulfuric acid)	E/Yellow	Acid gases and vapours (for example, sulphur dioxide, hydrogen chloride)
	Yellow	Acid gas and organic vapour	B/Grey	Inorganic gases and vapours (for example, chlorine (not carbon monoxide))
	Brown	Acid, ammonia, and organic vapours		
	Red	Acid gas, ammonia, carbon monoxide, and organic vapours		
	Green	Ammonia	K/Green	Ammonia and organic ammonia derivative

	US standard		EU standard	
			I/Orange	Iodine
	Blue	Carbon monoxide gas	CO/Black	Carbon monoxide
	White and yellow	Chlorine		
	Black	Organic vapour	A/Brown	Organic vapours with a boiling point>65°C
			AX/Brown	Certain organic compounds with a boiling point≤65 °C
			Hg/Red	Mercury vapour
			Nox/Blue	Nitrogen monoxide, Azote oxide, Nitrous vapour
	Olive	Other vapours and gases		
	Orange	Dust, fumes, and mists (non-radioactive)		
Particles EU: (EN 143 & EN 149) US: NIOSH ()	N95, R95, P95	Filters at least 95% of airborne particles	P1/White	Protection against particulates in concentrations up to 4xOEL
	N99, R99*, P99	Filters at least 99% of airborne particles	P2/White	Protection against particulates in concentrations up to 10xOEL
	N100, R100*, P100	Filters at least 99.97% of airborne particles	P3/White	Protection against particulates in concentrations up to 20xOEL
	N: Not oil resistant R: Oil resistant P: Oil proof * No NIOSH approvals are held by this type of disposable particulate respirator.			

Combination cartridges:

Some countries use combination cartridges which protect against several pollutants. An example from EU is the A2B2-P3 type of combination cartridges.

Figure 6.1: A2B2-P3 combination cartridges

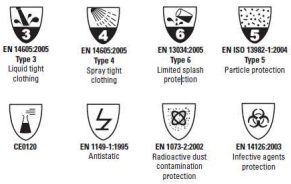
A filter with the colour code mentioned above is suitable for the contaminants that follow:

- Gases and vapours of organic compounds with a boiling point beyond 65 and 65th a with colour covered by filter class 2.
- Inorganic-gases and vapours (for example, chlorine, hydrogen sulphide, hydrogen cyanide) upto concentrations covered by filter class 2 and P particles upto concentrations covered by class 3.

7 Appendix 3: Coverall materials

0016336212

US standards		EU standards	
ANSI/ISEA 101-2014 American National Standard for Limited-Use and Disposable Coveralls-Size and Labelling Requirements ANSI 103-2010 Standard for Classification and Performance Requirements for Chemical Protective Clothing		EN14605, EN14605, EN13034, EN ISO 13982-1, EN1149-1, EN1073-2, EN 14126	
Type	**Protection**	**Type**	**Protection**
Category 1	A gas-tight chemical protective suit with an internal independent breathing air supply, such as a self-contained breathing apparatus, that is used where there is an immediate danger to life and health, immediate skin hazard or contamination hazard, or unknown atmosphere.	Type 1	Gas-tight clothing
Category 2	A gas-tight chemical protective suit with an external independent breathing air-supply used to respond to an immediate danger to life and health hazard, where the atmosphere is known and not likely to contaminate the breathing apparatus.	Type 2	Non-gas-tight clothing
Category 3	A liquid-tight full body chemical protective clothing used in non-immediate danger to life and health atmosphere, where the main hazard is from contact with liquids or splashes.	Type 3	Liquid-tight clothing
Category 4	A liquid spray-tight full body chemical protective clothing used in non-immediate danger to life and health situations, where there is a potential for splashes from liquids that are not immediately hazardous to the skin.	Type 4	Spray-tight clothing
Category 5	A particle-tight full body chemical protective clothing	Type 5	Particle protection

US standards		EU standards	
	used in non-immediate danger to life and health situations, where the major hazard is contamination from particles that present no hazard to the skin.		
Category 6	A limited spray-tight full or partial body chemical protective clothing that offers protection for a particular part of the body from liquid penetration, such as protection for medical personnel from blood-borne pathogens.	Type 6	Limited splash protection
		PB (6)	Partial body protection
			

8 Appendix 4: Fall protection equipment

0016336213

Equipment	Description/Vestas requirements	US standard	EU standard
Full-body harness	A full-body harness must be designed for fall protection, work support, climbing, rescue and evacuation.	ANSI/ASSE Z359.1-2007-Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components ANSI/ASSE Z359.11-2014-Safety Requirements for Full Body Harnesses	EN-361 Full body harness
Fall arrester for wire or rail system	A fall arrester for a wire or rail system must be designed with an energy absorber. The arresting force shall not exceed 6 kN.		EN-353-1 Rail-based glider system EN-353-2 Flexible anchor line glider system
Lanyard with energy absorber/ twin tail	A lanyard with an energy absorber/twin tail must be designed to arrest a fall and reduce the arresting energy to an acceptable level (maximum 6 kN). The lanyard must have 2 connectors/carabineers	ANSI/ASSE Z359.13-2013-Personal Energy Absorbers and Energy Absorbing Lanyards ANSI/ASSE Z359.12-2009-Connecting Components for	EN-355 Energy absorber EN-358 Support belts and lines EN-362 Carabiner

Equipment	Description/Vestas requirements	US standard	EU standard
	to attach to the anchor points. The opening of the carbines must be a minimum of 59 mm for easy attachment to anchor points. When the lanyard is not deployed, the length of the lanyard must not exceed 2 metres.	Personal Fall Arrest System	
Positioning rope	A positioning rope must be designed with length adjustment and a connector/carabineer for extra support. The opening of the carabineer must be a minimum of 59 mm for easy attachment to anchor points.	ANSI/ASSE Z359.3-2007-Safety Requirements for Positioning and Travel Restraint Systems	EN-795 Positioning rope
Climbing helmet	A climbing helmet must be equipped with a chinstrap to prevent the helmet from falling off. The helmet also protects against head injuries from falling objects.	ANSI Z89.1-2009-American National Standard for Industrial Head Protection	EN12492 Standard EN397
Safety helmet	A safety helmet protects against head injury from falling objects.	(29 CFR 1910.135(b)(1)) 1. ANSI Z89.1-2003, American National Standard for Industrial Head Protection (29 CFR 1910.135(b)(1)(i)) or 2. ANSI Z89.1-1997, American National Standard for Industrial Head Protection (29 CFR 1910.135(b)(1)(ii)) or 3. ANSI Z89.1-1986, American National Standard for Personnel Protection -Protective Headwear	EN 397 Specification for industrial safety helmets EN 12492 Mountaineering equipment-Climber's safety helmets
Safety footwear	Safety footwear must be designed with a safety toecap that is anti-static	ASTM F-2412-2005, Standard Test Methods for Foot Protection, and	EN ISO 20345:2011-Personal safety equipment – Safety footwear

Equipment	Description/Vestas requirements	US standard	EU standard
	and penetration-resistant. Ankle protection (boots that cover the ankle) is recommended for on-site activities/work.	ASTM F-2413-2005, Standard Specification for Performance Requirements for Protective Footwear (29 CFR 1910.136(b)(1)(i)) or ANSI Z41-1999, American National Standard for Personal Protection- Protective Footwear (29 CFR 1910.136(b)(1)(ii)) or ANSI Z41-1991, American National Standard for Personal Protection- Protective Footwear (29 CFR 1910.136(b)(1)(iii))	EN ISO 20347:2012
High-visibility apparel	On-site personnel must wear reflective vests and/or clothes to increase visibility.	ANSI/ISEA 107-Standard for High Visibility Safety Apparel	EN ISO 20471
Abrasion-resistant gloves	Abrasion-resistant gloves must be designed with abrasion, blade-cutting, tear and puncture-resistant specifications. The gloves must also be designed with a palm of Nitril or a similar material for better grip.	ANSI/ISEA 105-2011	EN388 Gloves Giving Protection from Mechanical Risks
Headlamp	A headlamp that mounts on a helmet for emergency light (a minimum of 35 lumen).		