



Risk-assessments for products within five categories: **Medical supplies**

A report for Direktoratet for forvaltning og IKT (DIFI) by
Swedwatch

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Introduction

Swedwatch has carried out risk-assessments on thirty-four products within five product categories on behalf of Direktoratet for forvaltning og IKT (DIFI). The risk-assessment reports aim to provide information on potential adverse impacts on labour rights and human rights in the supply chains of the selected products. The reports will guide contracting authorities on the importance of social considerations in their purchasing practices and when such criteria should be applied. The risk-assessments will also improve the readers' understanding of what to look for when monitoring supplier compliance.

It is important to note that the risk-assessments do not aim to scrutinise or describe the supply chain of any particular brand or supplier. The purpose is to give a general understanding of the potential risks linked to the product in general.

Each product is described based on components and materials used in the product. The general supply chain is presented in a table, along with a narrative explanatory paragraph. The supply chain table is divided into three sections; assembly, component and raw material, and provides an overview of most relevant countries.

General risks are outlined and those which are categorised as most adverse risks for each step of the supply chain are summarised in an introductory table in order to provide an overview. The grading at the bottom of the risk-matrix indicates a combination of the *severity* and *likelihood* of the risk and aims to provide guidance on where main risks are located in the supply chain. For example, when a product is assembled in both a high-risk and a low-risk context to more or less the same extent, the risk will be graded lower than if the product had been predominantly assembled in a high-risk environment. This also means that even if a number of potential severe risks are listed in the column, the risk may still be considered low if it is likely that the production mostly takes place under safe and sound processes in a low-risk environment.

The grading includes the following steps:

Very low risk	Low risk	Medium-high risk	High risk	Very high risk
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Method and data

The data used for the risk-assessments comes mainly from reports, articles, films and academic research. Suppliers, and to a smaller, degree industry organisations/initiatives, have also been interviewed to provide input to the understanding of the supply chains. Trading data has been used for the mapping of the supply chains, as transparency and traceability is often limited. Therefore, the supply chain data, especially on a component and raw material level, partly presents the likelihood of a certain producing country being included in the supply chain. The supply chain data can therefore not be viewed as exact for every single product procured by Norwegian contracting authorities, but as a general estimate.

The report was written October to December 2017.

Medical supplies

Product	Assembly	Component	Raw material
Medical supplies	High risk	High risk	High risk
Surgical instruments	High risk	High risk	High risk
Medical disposable gloves	High risk	High risk	High risk
Dressings and plasters	Medium-high risk	Medium high-risk	High risk

The medical supplies covered in this category are produced in several countries and regions and to a large extent in countries where there is a high risk of human rights and labour rights violations, such as China, Pakistan, Malaysia and Thailand. Supply chains are complex and traceability is general limited partly due to the use of sub-contractors, for example in the production of surgical instruments.¹

On a general level, risks are linked to both manufacturing and raw material extraction. Low wages, excessive overtime, lack of union rights, child labour and forced labour are some of the human rights risks. Migrant workers, common in several of the aforementioned high-risk countries, particularly face particular risks of being exploited, ending up in forced labour and being discriminated against. Furthermore, different types of plastics are used which means enhanced risks of exposure to chemicals and heat as well as toxic pollution of the surrounding area. Other high-risk materials, such as cotton, latex (natural rubber) and steel are also common in the production of medical supplies.

As a number of reports in recent years have documented severe labour rights abuses in factories producing surgical instrument and medical gloves, contracting authorities in the UK, Sweden and Norway have conducted factory audits. Investigative reports have concluded that continued audits can serve to improve labour conditions but that many problems remain, particularly in regards to health and safety.²

Some suppliers of medical supplies have also developed codes of conduct and assert that they take action to mitigate risks through auditing and supplier evaluation.³

This risk-assessment includes the following products:

- Surgical instruments
- Medical gloves
- Dressings and plasters

¹ Swedwatch, Healthier procurement, 2015

² Swedwatch, [Healthier procurement](#), 2015

³ See for example [Mölnlycke Healthcare](#)

Industry & Sector Initiatives

The Surgical Instruments Manufacturers Association of Pakistan (SIMAP)

The Surgical Instruments Manufacturers Association of Pakistan was established in 1958 and works to promote the industry by providing support in addressing issues that may hinder development within the sector. A lot of this work is executed through its member companies.⁴

BSCI

BSCI was launched in 2003 at the initiative of the Foreign Trade Association (FTA). The initiative works toward the integration by purchasing companies of the BSCI Code of Conduct into their business practices. BSCI provides support, auditing tools and a database for its members.⁵

Medtech Europe

Medtech Europe is a member organisation and industry initiative for companies and suppliers of medical products. The organisation works in part on environmental issues relevant for the industry.⁶

⁴ [The Surgical Instruments Manufacturers Association of Pakistan \(SIMAP\)](#)

⁵ Business Social Compliance Initiative, BSCI-intl.org

⁶ [Medtech Europe](#)

Surgical instruments

Summary of the most severe risks

Assembly/Manufacturing	Components	Raw materials
Poor health and safety Child labour Forced labour Violation of regulations on minimum wage Excessive overtime Lack of union rights Poor working conditions	Plastics, steel Forced labour Poor health and safety Pollution Lack of union rights Exposure to harmful fumes chemicals and temperatures Low wage Excessive overtime	Oil and iron ore: Poor health and safety Child labour Low wage Excessive overtime Lack of union rights Poor working conditions Forced labour Abuse of migrant workers Pollution with impacts on local communities Conflict with local communities Sexual abuse
High risk	High risk	High risk

The product

The manufacturing of surgical instruments is a large global industry, producing around 150 million reusable and disposable surgical instruments every year. The category includes hand instruments such as forceps, knives, saws, retractors, clamps, bone drills⁷ as well as tweezers and scissors. The instruments are made of stainless steel and/or plastics.

The supply chain

The dominant share of metallic surgical instruments on the global market is produced in Sialkot, northern Pakistan. Transparency beyond the first tier of the supply chain is very low. The value chain analysis of the surgical instruments market includes different stakeholders, namely raw material providers (oil and metal), metal processors, manufacturers of steel and plastic instruments,⁸ distributors, and retailers.

Surgical instruments of stainless steel are mainly produced in Pakistan and China. Some are manufactured in Germany (and to lesser extent also in Sweden). The raw material for stainless steel instruments is iron ore and iron scrap which has been refined in steelworks. China is the world’s largest iron ore producer, and a large refiner of iron scrap.⁹ Steel is to a small extent refined in Sweden.¹⁰

⁷ HighBeam Business, [Surgical and Medical Instruments and Apparatus](#) Retrieved 17-11-30

⁸ Enact Sustainable Strategies, Riskanalysis: Instrument, 2017

⁹ McKinsey & Company, Metals and Mining Practice, 2017

¹⁰ Enact Sustainable Strategies, Riskanalysis: Instrument, 2017

A large share of plastic instruments are manufactured in Sweden and Japan, using plastic material which most likely has been processed (granulated plastics) in China, the world’s largest plastics producer.¹¹

Manufacturing ¹²	Component	Raw Material
Stainless steel instruments Pakistan China ¹³ Germany Sweden ¹⁴	Oil based granulated plastics China ¹⁶ Steel China ¹⁷	Iron ore China (dominant), Australia, Brazil and India ¹⁸ Crude oil ¹⁹ Saudi Arabia, Russia, United Arab Emirates, Nigeria, Kazakhstan
Plastic instruments ¹⁵ Sweden Japan		

Risks

Risks are generally highest at point of extraction of raw materials and during the manufacturing phase in Pakistan.²⁰ Since the production of surgical instruments involves a range of sub-suppliers and activities in many countries, surgical instruments are linked to many risks that are challenging to identify.

Surgical instruments of stainless steel

In relation to manufacturing, over 50 000 workers in Sialkot, Pakistan, do most of the filing, grinding, hammering and polishing of instruments by hand. Reportedly, many people regularly work over 80 hours a week for inadequate wages, and frequently suffer musculoskeletal injuries, that are sometimes incapacitating.²¹ Health and safety is poor: there is risk of injury and exposure to toxic fumes and chemicals as well as loud noise as machine guards and personal protective equipment isn’t commonly used.²² The industry employs hundreds of children, some aged as young as 7 years. Many children work to pay off debts owed to their father’s employer. Most work full time and receive no formal education and are thus trapped in poverty.²³

¹¹ Enact Sustainable Strategies, Riskanalys: Instrument, 2017
¹² BMA, In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves, 2016
¹³ Swedwatch, Healthier procurement, 2015
¹⁴ Enact Sustainable Strategies, Riskanalys: Instrument, 2017
¹⁵ Enact Sustainable Strategies, Riskanalys: Instrument, 2017
¹⁶ Enact Sustainable Strategies, Riskanalys: Instrument, 2017
¹⁷ World Atlas, Top Iron Ore Producing Countries in the World, Retrieved 2017-11-28
¹⁸ World Atlas, Top Iron Ore Producing Countries in the World, Retrieved 2017-11-28
¹⁹ Observatory of Economic Complexity, Crude oil, Retrieved 2017-11-22
²⁰ Enact Sustainable Strategies, Riskanalys: Instrument, 2017
²¹ Santhakumar, A., and Mahmood, B., Humanitarian news, Labour rights violations in the manufacture of healthcare goods, 2015
²² Swedwatch, Healthier procurement, 2015
²³ Santhakumar, A., and Mahmood, B., Humanitarian news, Labour rights violations in the manufacture of healthcare goods, 2015 and United States Department of Labor, List of Goods Produced by Child Labor or Forced Labor Report, 2016

Many employees in Sialkot work on a per-piece rate, which is often associated with an unpredictable income. Personal safety equipment is rarely provided. In the few cases where training on work-related safety risks is offered, this tends to be inadequate. Without precautionary measures for workers that hone and weld, there are serious risks for negative health impacts, including respiratory problems, lung cancer, and poisoning/skin problems.²⁴

The production of steel is in many countries closely linked to serious health and security risks for employees. Production commonly takes place under harsh conditions, with extreme temperatures, heavy lifting and large machinery. This exposes employees to harmful fumes and dust.²⁵ The processing of steel (such as alloys) involves a range of chemicals that are harmful to humans and ecosystems. The extraction of iron ore entails similar risks.²⁶

In most countries, mining remains the most hazardous occupation.²⁷ Mine sites represent one of the deadliest work environments globally. Mining operations in many countries are tainted by child labour, sexual exploitation, severe health impacts, forced labour, extensive pollution of land and water, land grabbing, violation of indigenous peoples rights, and violent confrontations with armed security guards.²⁸ Chinese mine sites have been found to rely heavily on migrant workers, who receive less pay and work without personal protection equipment.²⁹

Surgical instruments of plastics

The processing which eventually creates the plastic material for plastic surgical instruments is likely mainly done in Chinese factories. Reports indicate that Chinese workers are subjected to excessive working hours, no and/or unpaid vacation, lack of freedom of association, inadequate salaries, and poor health and safety standards. Employees are often at risk of burns and other injuries linked to the handling of combustible chemicals and processing in high temperatures. The handling of cancerogenic chemicals is another risk factor.³⁰

A significant share of plastic instruments is manufactured in Sweden and Japan; countries with low levels of labour rights risks.³¹

The plastics used in surgical instruments originally derive from oil. Oil is extracted in a number of places worldwide with very limited traceability. Oil extraction is linked to environmental and social risks in Saudi Arabia, Russia, United Arab Emirates and Nigeria. Risks include lack of union rights, poor working conditions and forced labour as well as oil spills leading to adverse health impacts and contamination of soil and water for surrounding communities. Pollution often has detrimental

²⁴ Upphandlingsmyndigheten, [Risker inom upphandling av varor inom sjukvård och omsorg](#), 2016

²⁵ Enact Sustainable Strategies, Riskanalys: Instrument, 2017

²⁶ Enact Sustainable Strategies, Riskanalys: Instrument, 2017

²⁷ ILO, [Mining: A Hazardous work](#), Retrieved 2017-11-28

²⁸ Unicef, [Children's rights and the mining sector](#), 2015

²⁹ Enact Sustainable Strategies, Riskanalys: Instrument, 2017

³⁰ Swedwatch, [Healthier procurement](#), 2015

³¹ Enact Sustainable Strategies, Riskanalys: Instrument, 2017

impacts over communities' livelihood.³² Oil extraction in high-risk environments has also been linked to sexual exploitation and abuse of women in surrounding areas.³³

Medical disposable gloves

Summary of the most severe risks

Assembly/Manufacturing	Components	Raw materials
Exploitation of migrant workers Poor health and safety Poor working conditions Excessive overtime Low wage Forced labour Lack of union rights	Plastic materials and synthetic rubber Poor health and safety Exposure to heat and chemicals Pollution Lack of union rights Forced labour Low wages Excessive overtime	Natural rubber, oil Poor health and safety Child labour Forced labour People trafficking Poor working conditions Low wages Discrimination of migrant workers Lack of union rights Pollution with impacts on local communities Sexual abuse
High risk	High risk	High risk

The product

The manufacturing of medical gloves is a large global industry, producing well over 100 billion pairs of gloves per year.³⁴ Today, the vast majority of surgical gloves are made from latex, which is derived from natural rubber.³⁵ Latex-free medical gloves are commonly made of synthetic materials such as synthetic rubber, nitrile, neoprene or vinyl.³⁶ Synthetic gloves are produced from polymers of petrochemical origin.³⁷

Depending on the type, gloves are either powdered or non-powdered. Various types of powder, including cornstarch, is used.³⁸

³² Råvarumarknaden.se, [USA passerade Saudiarabien som världens största oljeproducent](#), Retrieved 2017-10-27

³³ Wday, [The Bakken's dirty secret: sex trafficking has growing precense in oil patch experts say](#) 2014-05-06, Al Jazeera, [The Dark side of the oil boom: Human trafficking in the Heartland, 2014-04-28](#)

³⁴ The manufacture of disposable gloves is estimated to 150 billion pairs of per year. Of all disposable gloves, an estimated 85-95% are used in the medical sector, and most of the remainder in the food sector. Shields D. [World Disposable Gloves Market - Opportunities and Forecasts, 2013-2020](#). Allied Market Research, 2014

³⁵ Surgeon Gloves, [Surgeon Glove Overview](#) Retrieved 2017-11-22

³⁶ Surgeon Gloves, [Surgeon Glove Overview](#) Retrieved 2017-11-22

³⁷ BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

³⁸ However, the use of powder on medical gloves presents numerous risks to patients and health care workers, which is why US authorities banned the use of powdered gloves effective in early 2017. Food and Drug Administration, [Final Rule \[Docket No. FDA-2015-N-5017\]](#)

The supply chain

The value chain analysis of the disposable gloves market includes different stakeholders, namely: raw material providers, manufacturers, distributors, and retailers.³⁹

Most glove production is outsourced to factories in Malaysia and Thailand and a handful of other Asian countries, including China, Indonesia and, to a lesser extent, Sri Lanka, the Philippines, Singapore and Vietnam. At present, around two-thirds of all disposable gloves are manufactured in Malaysia.⁴⁰ Malaysia mainly imports synthetic rubber from South Korea, Japan and Thailand.⁴¹ The traceability of the components used to produce the thermoset plastics - the base for synthetic rubber - is poor.

When it comes to latex gloves, the raw material is extracted from the rubber tree, which mostly grows in Southeast Asia, Western Africa and South America.⁴²

Manufacturing ⁴³	Component ⁴⁴	Raw Material
Malaysia Thailand China Sri Lanka Vietnam	Thermoset plastic such as nitrile, neoprene, vinyl: Japan China Germany USA	Main natural rubber producers: Thailand, Indonesia, Malaysia ⁴⁵ Other natural rubber producers: India, China, Malaysia, the Philippines, Guatemala, Ivory Coast, Brazil, Myanmar, Cambodia and Liberia ⁴⁶ Crude oil: Saudi Arabia, Russia, United Arab Emirates, Nigeria, Kazakhstan ⁴⁷

³⁹ Shields D. [World Disposable Gloves Market - Opportunities and Forecasts, 2013-2020](#). Allied Market Research, 2014

⁴⁰ BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

⁴¹ Observatory of Economic Complexity, [Where does Malaysia import synthetic rubber from? \(2016\)](#), Retrieved 2017-11-24

⁴² HIS Markit, [Chemical Economics Handbook, Natural Rubber](#), 2017

⁴³ BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

⁴⁴ The USA and China are the largest exporters of vinyl. Observatory of Economic Complexity, [Vinyl Chloride Polymers](#) Retrieved 17-11-22 Business Wire, Technavio Announces Top Seven Vendors in the Global Neoprene Market from 2016 to 2020, 2016-06-27. Thermoset plastic materials include a range of types, of which natural rubber, nitrile, neoprene and vinyl are a few. [Global Thermosetting Plastics Market - Segmented by Type, Industry and Geography - Trends and Forecasts \(2015-2020\)](#), 2015. BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

⁴⁵ HIS Markit, [Chemical Economics Handbook, Natural Rubber](#), 2017

⁴⁶ HIS Markit, [Chemical Economics Handbook, Natural Rubber](#), 2017

⁴⁷ Observatory of Economic Complexity, [Crude oil](#). Retrieved 2017-11-22

Risks

The manufacturing of disposable medical gloves involves high risk of labour rights abuse. The manufacturing sector in the production-countries in Asia is generally characterised by dire labour conditions and elevated risks related to human rights and corruption. This includes factories manufacturing for small-scale medical glove- suppliers as well as those manufacturing for major international brands.⁴⁸

Examples of some of the most common challenges in these countries, including within glove manufacturing, are: underpayment, work environment with weak health and safety procedures, unpaid and compulsory overtime and infringements on the freedom of association and unionisation.⁴⁹

Many factories in these regions are reliant on migrant workers who are exposed to particular risks. Malaysian glove factories in particular have become infamous for the ill-treatment of migrant workers. Serious labour rights concerns have been documented at many of these factories, including: excessive working hours and production targets, inadequate pay, extortionate recruitment fees, illegal confiscation of passports, and anti-union activities. In some factories, there have been allegations of illegal imprisonment of workers and beatings.⁵⁰

The process for manufacturing medical gloves varies between factories. Factories that rely on more chemical-intensive production processes risk exposing employees to toxic substances.⁵¹ For example, manufacturing of nitrile, neoprene and vinyl gloves (i.e. synthetic rubber gloves) commonly involves cancerogenic chemicals which can have serious negative impacts on workers' health.⁵² During the vulcanization of gloves, employees can be exposed both to heat from the presses and to fumes from the heated rubber products.⁵³

Although some extraction is conducted at smaller, family-based farms, extraction of rubber commonly takes place in large rubber tree plantations in tropical climates. The work environment is usually demanding and includes exposure to malaria and highly toxic chemicals such as paraquat – a chemical commonly used in pesticides which is prohibited in the EU due to its severe impacts on humans, animals and the environment.⁵⁴

⁴⁸ BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

⁴⁹ Enact Sustainable Strategies, [Riskanalys: medicinska undersökningshandskar](#), 2017

⁵⁰ BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016, and Finnwatch, [Working conditions improve at medical glove manufacturer's Malaysian factory](#), 2016. Retrieved 2017-11-22

⁵¹ Manufacturing of medical gloves has been found to include exposure to chemical products such as caustic soda, potassium hydroxide, ammonia, chlorine gas, and hydrochloric acid, often with inadequate storage of these chemicals, or inadequate personal protective equipment for employees. BMA, [In Good Hands – Tackling labour rights concerns in the manufacture of medical gloves](#), 2016

⁵² Enact Sustainable Strategies, [Riskanalys: medicinska undersökningshandskar](#), 2017

⁵³ International Agency for Research on Cancer, [Chemical Agents and Related Occupations](#), 2012

⁵⁴ Danwatch, [Behind the rubber label](#), 2013

Studies from different natural rubber producing countries⁵⁵ have identified similar labour rights abuses at rubber plantations, including: wages below minimum wage, lack of freedom of association, and discriminatory practices in the treatment of migrant workers with reports of confiscation of personal documents, subminimum wages, discrimination, and lack of necessary safety equipment. In several countries, including top exporters Thailand, Indonesia, Vietnam and Myanmar, rubber plantations are also dependent on forced labour. Although exact figures are lacking, the number of victims of forced labour is believed to be considerable.⁵⁶ Trafficking of migrants from Myanmar and other countries is also a risk.⁵⁷

Child labour in rubber plantations exists in many countries, including Cambodia, Indonesia, Myanmar⁵⁸ and Malaysia.⁵⁹ The children often work under hazardous conditions, which include the use of sharp tools and spraying of pesticides; tasks that require significant physical effort. Many drop out of school to work full-time and work long days.⁶⁰ A study published in 2016 by the Vietnamese Government estimated that 10,224 children were involved in rubber production - 42.5 percent of which were under the age of fifteen, with some as young as 5 years old.⁶¹

The synthetic materials used in medical gloves originally derive from oil. Oil is extracted in a number of places worldwide with very limited traceability. Oil extraction is linked to environmental and social risks in Saudi Arabia, Russia, United Arab Emirates and Nigeria, including lack of union rights, poor working conditions and forced labour as well as oil spills leading to health impacts and contamination of soil and water for surrounding communities.⁶²

⁵⁵ [Danwatch, Verité, Fair Rubber Association](#)

⁵⁶ Verité, [Rubber](#) Retrieved 2017-11-20

⁵⁷ Human Rights Watch, [From the tiger to the crocodile: Abuse of migrant workers in Thailand](#), 2010

⁵⁸ United States Department of Labor, [List of Goods Produced by Child Labor or Forced Labor](#), Retrieved 2017-11-20

⁵⁹ US Department of Labor, [Report on child labor, Thailand](#), 2012; ILO, [Combating the worst forms of child labour in shrimp and seafood processing areas in Thailand](#), 2016; Danwatch, [Do you use rubber?](#), Jan 2013

⁶⁰ United States Department of Labor, [List of Goods Produced by Child Labor or Forced Labor](#), Retrieved 2017-11-20, United States Department of Labor, [List of Goods Produced by Child Labor or Forced Labor Report](#), 2016

⁶¹ United States Department of Labor, [List of Goods Produced by Child Labor or Forced Labor Report](#), 2016

⁶² Råvarumarknaden.se, [USA passerade Saudiarabien som världens största oljeproducent](#), Retrieved 2017-10-27

Dressings and plasters

Summary of the most severe risks

Assembly/Manufacturing	Components	Raw materials
Poor health and safety Excessive working hours Low wages Forced labour Child labour Lack of union rights Exploitation of migrant workers	Poor health and safety Exposure to chemicals Excessive working hours Low wages Forced labour Child labour Lack of union rights Exploitation of migrant workers	Oil, cotton, cellulose Poor health and safety Exposure to pesticides and chemicals standards Child labour Forced labour Excessive working hours Lack of union rights Inadequate salaries Impact on indigenous peoples' rights Environmental pollution Negative impacts on local communities Sexual abuse
Medium-high risk	Medium-high risk	High risk

The product

There is a wide variety of wound-care products. Apart from plasters and compresses, there is a large variation of dressings that serve many purposes depending on the wound.

Common dressings are presented in the table below. It lies beyond the scope of this risk assessment to identify risks associated with all the substances and materials in each dressing-type. Polyurethane foam dressing is commonly used⁶³, and this risk-assessment will therefore focus on this type of dressing.

Type of dressing	Commonly contains
Foam	Generally made from semipermeable polyurethane and plastic polymer. May contain silver
Hydrocolloid	Contain a chemical substance, commonly either gelatine, pectin and carboxymethyl cellulose. The surface is coated with a substance which contains polysaccharides and other polymers.
Cloth	Cotton· rayon fleece
Hydrogel	Absorbent polymer. The top surface is a waterproof polyurethane film.

⁶³ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017

Alginate	Sodium and seaweed fibers
Collagen	Different versions are gels, pads, particles, pastes, powders, sheets or solutions derived from bovine, porcine or avian sources. Collagen is derived from animals, generally cattle, pigs and horses.
Hydrofiber	Sodium carboxymethylcellulose fibers
Silicone	Different versions such as gel, foam, sheets, and tape, which contain synthetic polymers.
Cover dressings such as wraps, gauze and tape	Cotton, acrylic fleece, rayon, polyester, cellulose

Polyurethane foam dressings are mainly made of layers of polyurethane or polyethylene, with a foam core made of viscose, polyester and cotton. An outer plastic film is made of polyurethane. The raw materials used for polyurethane foam dressings are crude oil, wood-based fiber and cotton. Silver (silver sulfadiazine) is also used in some types foam dressings.

Plasters are generally made of an oil-based plaster film coated with an even layer of adhesive and an absorbent wound pad centered on the plastic film. The adhesive coated surface is covered by two partially overlapping silicon strips.⁶⁴ The absorbent parts are commonly made of cellulose.⁶⁵ Some plasters are made with viscose from cellulose or cotton. Others come with antiseptic ointments or silver technology.⁶⁶

The supply chain

The supply chains for dressings, plasters and compresses are opaque and end-buyers tend to have poor insight beyond the first tier.⁶⁷

China is considered to produce most of the foam cores for polyurethane dressings, while the end-product is commonly made in China, Great Britain, USA and Finland. A significant share of plastic film is manufactured in the Netherlands and Great Britain. The Netherlands is also an important producer of silver sulfadiazine.⁶⁸ Information on origin of the raw materials used is limited.⁶⁹

Plasters are produced in many countries, including several EU countries. It can be assumed that part of the materials used for plasters made in Europe have been imported from high-risk countries that produce plastics, viscose, cotton and silver.

⁶⁴ Salvequick, [FAQ](#), Retrieved 2017-11-29

⁶⁵ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017

⁶⁶ Elastoplast, [Cuts and grazes](#), Retrieved 2017-11-29

⁶⁷ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017

⁶⁸ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017

⁶⁹ This risk assessment relies heavily on a survey among Swedish public procurers of medical products, conducted by Enact Sustainable Strategies in 2017. The survey results are presented in Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017.

China is the world’s leading producer of plastics, and it is therefore likely that most of the plastics in wound treatment products have been processed in Chinese factories.⁷⁰

It is unclear where the process to turn cellulose into pulp for viscose takes place. However, China, India and Indonesia are the world’s largest producers of staple fibers of viscose rayon.⁷¹ Some of the largest pulp producing countries are associated with low-risks for labour rights violations, namely: USA, Canada and Sweden. However, high-risk countries such as India and China are increasing their pulp production.⁷²

The cotton sector is known for poor traceability and highly complex supply chains. Hybrid cottonseed production, farming and processing take place in different places.⁷³

Manufacturing ⁷⁴	Component	Raw Material - main producers
China, Great Britain, USA, Finland	<p>Plastic film: USA, Great Britain, Finland</p> <p>Foam core: China</p> <p>Silver sulfadiazine: The Netherlands</p>	<p>Wood-based fibres (pulp): USA, Canada, Sweden, Russia, China, India⁷⁵</p> <p>Viscose: China, India, Indonesia⁷⁶</p> <p>Cotton India, China, USA, Pakistan, Brazil, Australia, Uzbekistan⁷⁷</p> <p>Silver (mainly in) Mexico, Peru, China⁷⁸</p> <p>Crude oil Saudi Arabia, Russia, China, United Arab Emirates, Nigeria, Kazakhstan (and others)⁷⁹</p>

Risks

Risks are generally highest at the point of extraction of raw material and during the manufacturing phase in China. Since transparency is low and the materials used in these medical products involve a

⁷⁰ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017
⁷¹ Observatory of Economic Complexity, [Staple fibres of viscose rayon](#), Retrieved 2017-11-30
⁷² World Atlas, [All about the pulp and paper industry](#), Retrieved 17-11-30
⁷³ Miljöstyvningsrådet, [Riskanalys av råvaror till textilier, elektronik och biodrivmedel](#) 2010
⁷⁴ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017
⁷⁵ World Atlas, [All about the pulp and paper industry](#), Retrieved 2017-11-30
⁷⁶ Observatory of Economic Complexity, [Staple fibres of viscose rayon](#), Retrieved 2017-11-30
⁷⁷ Statista, [Cotton production by country worldwide 2016/2017](#), Retrieved 2017-11-30
⁷⁸ Investing News, [Silver](#), 2017-08-22
⁷⁹ Observatory of Economic Complexity, [Crude oil](#), Retrieved 2017-11-22

range of sub-suppliers and activities in many countries, this product category is linked to many risks that are challenging to identify.

Labour rights are overall at risk in Chinese production plants. Chinese workers are in many cases subjected to excessive working hours, no/unpaid vacation, lack of freedom of association, inadequate salaries, and poor health and safety standards.⁸⁰ Migrant workers from rural areas constitute a particularly vulnerable group, in which individuals often lack contracts and access to social security.⁸¹ Forced labour and even child labour has been identified in the Chinese manufacturing industry.⁸² Employees are often at risk of burns and other injuries linked to the handling of combustible chemicals and processing in high temperatures.⁸³ The handling of cancerogenic chemicals is another risk factor in such work environments.

The plastic materials originally derive from crude oil. Oil is extracted in a number of places worldwide with very limited traceability. Oil extraction is linked to environmental and social risks in Saudi Arabia, Russia, China, United Arab Emirates and Nigeria among other. Risks include lack of union rights, poor working conditions and forced labour as well as oil-spills leading to health impacts and contamination of soil and water for surrounding communities. The pollution often has detrimental impacts over communities' livelihood.⁸⁴ Oil extraction (and mining) in high-risk environments has also been linked to sexual exploitation and abuse of women in surrounding areas.⁸⁵

The risks within forestry relates mainly to health and safety. Main concerns are related to lack of adequate protection equipment and training for employees. Wood that originates from Russia, China and the Baltics (and also Asian and West African countries) are at high risk of links to illegal logging; a rapidly growing industry globally that carries detrimental impacts on local communities, including land grabbing, deforestation and violence.⁸⁶ Migrant workers are also at increased risk of exploitation and forced labour.⁸⁷

Wood is treated with chemicals to produce pulp. In countries with poor adherence to regulations on chemical management, this process involves risks for humans and the environment. The processing of pulp into viscose involves many steps which can expose employees to health and safety risks.

Cotton production is linked to serious labour rights and human rights violations. For instance, 20 countries have been found to have child labour and/or forced labour in their cotton production

⁸⁰ China Labour Bulletin, [Wages and Employment](#), Retrieved 17-12-06

⁸¹ China Labour Bulletin, [Migrant workers and their children](#), Retrieved 2017-11-30

⁸² United States Department of Labor, [List of Goods Produced by Child Labor or Forced Labor](#), Retrieved 2017-11-20

⁸³ China Labour Bulletin, [The Dark Side of the Toy World](#), Retrieved 17-12-06. CCTV, [Plastic factory blows up in north China province](#), 2017

⁸⁴ Råvarumarknaden.se, [USA passerade Saudiarabien som världens största oljeproducent](#), Retrieved 2017-10-27

⁸⁵ Wday, [The Bakken's dirty secret: sex trafficking has growing precense in oil patch experts say](#) 2014-05-06, Al Jazeera, [The Dark side of the oil boom: Human trafficking in the Heartland, 2014](#)-04-28, Columbia law school, Righting wrongs? [Barrick Gold's remedy mechanism for sexual violence in Papua New Guinea](#) November 2015

⁸⁶ Världsnaturfonden, [Illegal skogsverkning och virkeshandel](#), Retrieved 2017-11-30

⁸⁷ Nederland MVO, CSR Risk [Russian Federation](#), Freedom House, Freedom in the World 2013 - Russia, Retrieved 2017-11-01 Eurasia Foundation, [Protection the rights of migrant workers in Russia](#), 2013;

sector.⁸⁸ In Central Asia, cotton production has been found to be an important financial source for authoritarian regimes and for contributing to critical environmental impacts.⁸⁹ Cotton production in India and Pakistan is similarly problematic, with endemic levels of child labour. Child labour in hybrid cottonseed production in India is rife.⁹⁰ Many children work 9-12 hours a day and suffer from health problems related to exposure to pesticides.⁹¹

Mining is one of the most high-risk sectors in the world. In most countries, mining remains the most hazardous occupation.⁹² Extraction and processing of silver requires chemicals such as cyanide and mercury. Both can be harmful to humans and the environment. If not managed properly, exposure to mercury can damage the central nervous system and the kidneys.⁹³ Recycled silver, which is increasingly used today, has less negative impacts. Silver mines in several countries, including Mexico, Guatemala and Chile are highly controversial due to their negative impacts on local communities. Severe water pollution, land controversies, killings of protestors, and failure to respect indigenous peoples' rights are a few of the concerns.⁹⁴

⁸⁸ United States Department of Labor, [2016 List of Goods Produced by Child Labor or Forced Labor](#), 2016

⁸⁹ Environmental Justice Foundation, [The True Costs of Cotton: Cotton Production and Water Insecurity](#), 2012

⁹⁰ Ethical Trading Initiative Norway, [Cotton's forgotten children](#), 2015

⁹¹ Fairtrade, [Fairtrade and Cotton](#), 2015

⁹² ILO, [Mining: A Hazardous work](#), Retrieved 2017-11-28

⁹³ Enact Sustainable Strategies, Riskanalys: Förband och sårvård, 2017

⁹⁴ Telesur, [Canadian Mining Giant Violently Evicts Villagers in Mexico](#), 2017-01-31, The Guardian, [The Canadian company mining hills of silver – and the people dying to stop it](#), 2017-07-13, Observatorio de Conflictos Mineros en América Latina, [Juan Claro, Julio Ponce y Pascua Lama, algunos de los casos más polémicos que esperan decisiones clave del Tribunal Ambiental](#), 2017-09-13