# Risk assessment for new activities

Read safety data sheets, instructions, manuals, the laboratory safety manual and other relevant documents before executing the risk assessment. Work must not begin before a risk assessment have been carried out and the necessary actions have been taken to prevent ill health and accidents at work.

## Risk assessment

The risk assessment needs to be carried out in the light of the general experience gained in the work.

* Low risk**:** Risk that can cause insignificant or rapid transient illness/damage to person, organization, environment or property.
* Medium risk: Risk that can cause significant illness/injury (first aid treatment) to a person, organization, environment or property. Alternatively, an acceptable risk that occurs frequently.
* High risk: Risk that can cause serious and/or permanent illness/ injury to a person (sick leave/permanent injury), organization, environment or property or alternatively significant risk that occurs frequently.

## Actions

Low risk is acceptable until further notice/within a certain period of time and does not need to be addressed. Medium risk and high risk are addressed before the activity begins. Actions can address the risks at work by trying to remove them or by reducing the risk of the worker being exposed to them.

* Elimination: can the hazard be eliminated altogether e.g. by eliminating the need to do the job?. If elimination is not possible can something less harmful be used instead e.g. using fiberglass as an insulating material instead of asbestos?
* Engineering: can the hazard be isolated from the person e.g. through machine guarding dust/fume extraction, sound dampening devices or the person being isolated from the hazard e.g. by installing handrails or other barriers or changes to materials and equipment?
* Administration: where the other preferable controls are not possible or not sufficient on their own are there other controls available such as training, written procedures, permits to work for high risk activities, job rotation, job sharing, changes to work methods considered?
* Personal Protective Equipment (PPE) – the least preferred option because it is totally dependent on the individual to use, wear it and maintain it correctly. The problem is the hazard is still there so exposure to the hazard will occur if the PPE is not used correctly.

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| 1. **A Brief description of the activity to be conducted:**
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| *List the chemicals, the biological material, the equipment, the tools, the pressurized devices, the technology, etc. used during the activity.* | *List hazardous conditions (fire hazards, explosive, infectious, toxic, harmful, carcinogenic, sharp objects, hand and power tools, noise and vibration, crushing hazards, health risks, ionizing and non-ionizing radiation).* |
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| 1. Biohazards *(see Appendix 3 for more information regarding Laboratory Biosafety Levels)*
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| [ ]  BSL-1 [ ]  BSL-2 [ ]  BSL-3 [ ]  BSL-4 [ ]  Not applicable [ ]  Genetically Modified [ ]  Animal work[ ]  Non-Genetically Modified [ ]  Human cells, blood etc. [ ]  Permits issued by Swedish Work Environment Authority |
| Routes of transmission:[ ]  Direct contact [ ]  Droplet transmission [ ]  Airborne transmission [ ]  Bloodborne transmission[ ]  Transmission through eyes, nose and/or mouth [ ]  Vector transmission [ ]  Transmission by needle punctures and cuts [ ]  Other: |
| Can disease develop:[ ]  Yes [ ]  No [ ]  Do not know |
| If yes, how serious is the disease: |
| Symptoms if infected:  |
| Available treatment (e.g. antibiotics)[ ]  Yes (enter the treatment): [ ]  No [ ]  Do not know |
| Assessment of the duration of exposure:  |
| Specification of storage:[ ]  Ventilated cabinet [ ]  Explosion Proof cabinets [ ]  [Fire Rated Storage Cabinets](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Refrigerator](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Acid proof cabinet](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Steel cabinet](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [freezer](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Cryogenic freezer](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Bunding](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Not applicable](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Other:](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets)  |
| Waste management:[ ]  Cytotoxic and pharmaceutical waste [ ]  Chemical waste[ ]  Infectious or sharp waste [ ]  Radioactive waste [ ]  Other: |
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| Medical check-ups and health assessments *(tick on relevance)*[ ]  Vaccination: [ ]  Medical examination[ ]  Medical examination (hearing tests due to noise pollution)[ ]  Medical certificate[ ]  Other:  |
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| 1. **Chemicals**

Preparation: |
| What are the safety ventilation needs? [ ]  Protection level 1 *( Open bench:biohazard safety cabinet class IOpen bench, biohazard safety cabinet class I)*[ ]  Protection level 2 *(Safety ventilated workstations such as fume cupboards, fume benches, local exhaust ventilation, microbiological safety cabinets, biohazard safety cabinet class II )*[ ]  Protection level 3 *(special premises or special local routines)* |
| Possible hazardous exposure due to:[ ]  Chemical inhalation [ ]  Direct contact [ ]  Splashes into the eye [ ]  Accidental intake through mouth [ ]  Other:  |
| Possible interacting effects and reactions: |
| Assessment of the total duration of exposure:  |
| Do not store together with:[ ]  Acid [ ]  Base [ ]  Organics [ ]  Nitric Acid [ ]  Alcohol [ ]  Oxidizing material [ ]  Hydrogen Peroxide [ ]  Ketones[ ]  Inflammable liquid [ ]  Inflammable gas [ ]  Flammable material [ ]  Not applicable [ ]  Other: |
| Specification of storage:[ ]  Ventilated cabinet [ ]  Explosion Proof cabinets [ ]  [Fire Rated Storage Cabinets](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Refrigerator](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Acid proof cabinet](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Steel cabinet](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [freezer](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Cryogenic freezer](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Bunding](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Not applicable](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) [ ]  [Other:](https://www.fireking.com/products/fire-rated-cabinets/fire-rated-storage-cabinets) |
| Waste management:[ ]  Cytotoxic and pharmaceutical waste [ ]  Chemical waste[ ]  Infectious or sharp waste [ ]  Radioactive waste [ ]  Other: |
| Environment:*Mark contingently recipient of chemicals or its waste*:[ ]  Emission to air [ ]  Emission to water [ ]  Emission to ground [ ]  Not applicable |
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| 1. **Silica and wood dust**

The work is carried out: [ ]  indoors [ ]  outdoors |
| Quartz content in handled material: [ ]  Do not know |
| Assessment of the duration of exposure:  |
| Creation and spread of Silica and wood dust:  |
| Waste management: |
| Describe the routine of cleaning *(when working with stone dust, cleaning must be carried out so that dust is not swirled up or spread):* |
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| 1. **Working alone in the laboratory**

Do you think that there might be a possibility that you will be working alone during the performance of the activity: [ ]  Yes [ ]  NoA person is considered working alone if they are working by themselves in such a way that assistance is not readily available should injury, illness or emergency occur. Safe working arrangements shall be introduced to minimize the risks as far as reasonably possible. |
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| 1. **Personal protective equipment**

*State what personal protective equipment is required for the work, and the procedures for which the equipment is to be worn:*[ ]  Protective glasses [ ]  Protective gloves [ ]  Breathing protection[ ]  Ear protection [ ]  Protective clothing [ ]  Protective shoes [ ]  Lead apron [ ]  Chemical protective suits [ ]  Not applicable [ ]  Other: |
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| 1. **First aid and readiness for accident, fire or overflow**

*State what emergency equipment is available/needed for work:* |
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| **9. Pregnancy and breastfeeding *(tick on relevance)***[ ]  I´m pregnant[ ]  I have recently given birth to a child (no more than 2 weeks before the activity is initiated)[ ]  I´m breastfeedingThe employer, together with a safety representative and the employee concerned, shall immediately carry out a separate risk assessment (risk assessment template for changes) to examine working conditions. |

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| Date: | School: | Unit/group: | Location: |
| Reviewed by: | Other: | Name and title of the performer of the risk assessment: |
| Head of unit/group: | Signature Head of unit/group: | Signature performer: | Time of the next planned risk assessment: |
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| **Risks and sources of risks***(Risk assessment of the inherent risks and other risks that may arise ( see table 1* *description of the activity to be conducted).* *When chemicals are used in the activity: see Annex I (inherent risks of chemicals) and Annex II (level of exposure) for the risk assessment of chemicals).* | **Risk assessment** *(see page 1)* | **Description of actions***(Low risk is acceptable until further notice/within a certain period of time and does not need to be addressed. Medium risk and high risk are addressed before the activity begins).* | **Responsible for actions** | **Completed***(tic the box when the action is complete)* | **Risk assessment after the action** |
|  | Low risk | Medium risk | High risk |  |  |  | Low risk | Medium risk | High risk |
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##  Annex I, Inherent risks of chemicals

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| Risk category |
| **High risk**Carcinogenic, mutagenic, toxic for reproduction (high classification) R-phrases: R39,R40,R45,R46,R49,R60,R61,R62,R63,R68H-statements: H350,H351,H350i,H360,H360D,H360Df,H360FH,360FD,H360Fd,H361,H361d,H361f,H361fd,H362,H370, H371,H372, H373,H340, H341(Extremely) explosive or extremely flammable substance or gases R-phrases: R1,R2,R3,R4,R6,R9,R11,R12,R14,R15,R16,R17H-statements: EUH001,EUH006, EUH044,H200,H201,H202,H203, H204,H205,H220, H221,H222,H223,H224,H225,H240,H241,H250,H251,H260,H271,H280,H281(Very) toxic substances R-phrases: R23,R24,R25,R26,R27,R28H-statements: H300,H301,H304,H310, H311,H330, H331, EUH029,EUH031,EUH032,EUH070Substances that can cause allergy by inhalation R-phrases: R42H-statements: H334Substances that can cause allergy on skin contact R-phrases: R43H-statements: H317(Very) toxic to aquatic organisms R-phrases: R50,R50/53H-statements: H400,H410Corrosive substances R-phrases: R34,R35H-statements: H314,H318,H319,EUH071Toxic to environment and aquatic organisms R-phrases: R51,R51/53,R54,R55,R56,R57,R59H-statements: EUH059,H401,H411,H420- Substances with a maximum level limit value less than 1mg/m³ |
| **Medium risk**Hazardous substances and/or irritating substances R-phrases: R20,R21,R22,R36,R37,R38H-statements: H336,H302,H303,H305,H312,H313,H332,H333,H315,H320,H335,EUH066Substances that are explosive under certain conditions. Flammable substances R-phrases: R5,R7,R8,R10,R18,R19H-statements: H226,H227,H228,H242,H252,H261,H270,H272,EUH014,EUH018,EUH019,Harmful to aquatic organisms. Long-term adverse effects in the environment R-phrases: R52,R52/R53,R53,R58H-statements: H402,H412,H413Substances with a maximum level limit value bigger than or equal to 1 mg/m³ but less than 5mg/m³**Low risk**Substances with a maximum limit value bigger than or equal to 5 mg/m³ |

## Annex 2, Level of exposure

The level of exposure should be calculated under this section (see table).
The level is worked out by multiplying the factors by each other (exposure level = Factor A \* Factor B \* Factor C).

Total value up to 1000 = Low exposure level

Total value 1 001 10 000 = Medium exposure level

Total value above 10 000 = High exposure level

Where jobs are performed often (e.g. daily) or last for long periods, this extra factor should also be taken into account when assessing their exposure level. This applies in particular to substances covered by the R-phrases R33 ("Danger of cumulative effects") and R48 ("Danger of serious damage to health by prolonged exposure"). Check material safety data sheet (MSDS) item 9 for information on properties.

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|  | Factor=1 | Factor=10 | Factor=100 |
| 1. **Quantity of the substance**
 | < 1 g< 1 ml | 1 - 10 g1 - 10 ml | > 10 g> 10 ml  |
| 1. **Physical properties of the substance**
 | Solid substancesNon-volatile substancesNo skin absorption | Dust-producing substancesVolatile substances, Concentrated solutionsLow skin absorption | Gases or aerosolsHighly volatile substancesSubstances readily absorbed through the skin |
| 1. **Working method**
 | Predominantly closed systemLow risk of incorrect handling | Partially open systemMedium risk of incorrect handling | Open handlingHigh risk of incorrect handling |

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| Description | Abbreviation | Boiling point (°C) | Example |
| Very volatile (gaseous) organic compounds | VVOC | <0 till 50-100 | Propane, butane, methyl chloride |
| Volatile organic compounds | VOC | 50-100 till 240-260 | Formaldehyde, d-Limonene, toluene, acetone, toluene, ethanol (ethyl alcohol) 2-propanol (isopropyl alcohol), hexanal |

## Annex 3, Laboratory Biosafety Levels

**BSL-1:** As the lowest of the four, biosafety level 1 applies to laboratory settings in which personnel work with low-risk microbes that pose little to no threat of infection in healthy adults. An example of a microbe that is typically worked with at a BSL-1 is a nonpathogenic strain of *E. coli*.

This laboratory setting typically consists of research taking place on benches without the use of special contaminant equipment. A BSL-1 lab, which is not required to be isolated from surrounding facilities, houses activities that require only standard microbial practices

**BSL-2:** This biosafety level covers laboratories that work with agents associated with human diseases (i.e. pathogenic or infections organisms) that pose a moderate health hazard. Examples of agents typically worked with in a BSL-2 include equine encephalitis viruses and HIV, as well as *Staphylococcus aureus (staph infections).*

BSL-2 laboratories maintain the same standard microbial practices as BSL-1 labs, but also includes enhanced measures due to the potential risk of the aforementioned microbes. Personnel working in BSL-2 labs are expected to take even greater care to prevent injuries such as cuts and other breaches of the skin, as well as ingestion and mucous membrane exposures.

**BSL-3:** Again building upon the two prior biosafety levels, a BSL-3 laboratory typically includes work on microbes that are either indigenous or exotic, and can cause serious or potentially lethal disease through inhalation. Examples of microbes worked with in a BSL-3 includes; yellow fever, West Nile virus, and the bacteria that causes tuberculosis.

The microbes are so serious that the work is often strictly controlled and registered with the appropriate government agencies. Laboratory personnel are also under medical surveillance and could receive immunizations for microbes they work with.

**BSL-4:** BSL-4 labs are rare. As the highest level of biological safety, a BSL-4 lab consists of work with highly dangerous and exotic microbes. Infections caused by these types of microbes are frequently fatal, and come without treatment or vaccines. Two examples of such microbes include Ebola and Marburg viruses.