



IMPORTANT GUIDELINES

GENERAL RISKS

RESULTING FROM THE NATURE AND CHARACTER OF HAZARDOUS CHEMICAL SUBSTANCES, MECHANICAL, THERMAL AND OTHER EFFECTS OF THE COMPANY'S PRODUCTION AND INDIVIDUAL PRODUCTION SECTIONS

Document related to Directive 401 "Basic OSH Regulations" and Directive 402 "Safety Rules for Workers of Other Organizations"

Released: 7. 11. 2024

Elaborated by: ORLEN Unipetrol RPA s.r.o. - Safety and Risk Prevention Department

1 HAZARDS - RISKS

The Chempark Záluží and the Kralupy nad Vltavou Chemical Production Area are production sites with a high concentration of chemical and energy equipment in which hazardous substances are present. There is also extensive rail and road traffic in and around these sites. Some hazardous substances are present in the company's premises in the facilities of other external entities (AIR PRODUCTS spol. s r.o., SYNTHOS Kralupy a.s., etc.). The source of the hazard is the processing, production, storage, transport and handling of hazardous substances and the nature of the production facility. These substances are present on the company's premises mainly in liquid or gaseous form and their hazardousness in the event of non-compliance with regulations and procedures lies in their ability to cause a serious accident. The consequence of such a major accident may be a fire, explosion or release of hazardous substances which may result in damage or endangerment to the life and health of persons, the environment or damage to property.

1.1 Leakage of flammable gases and vapours

In the event of a leakage of flammable gases and vapours:

- a) the immediate initiation of a cloud of flammable gases and vapours at the point of leakage (or the leakage and spontaneous ignition of pressurised hydrogen);
- b) fire and subsequent burns to persons, damage to property, destruction (collapse) of metal structures by heat, fumigation of the area,
- c) an explosion, in which persons and property are additionally endangered by a pressure wave and the scattering of debris,
- d) the advancement of a cloud of flammable gases or vapours downwind into or out of the company premises, with possible initiation by the path (within the range of the upper and lower explosive limits of their mixture with air), the possible consequences are the same as in the previous point.

1.2 Flammable liquid leakage

In the event of a flammable liquid leak:

- a) in the event of immediate initiation of a pool fire and subsequent burns to persons, damage to property, destruction (collapse) of metal structures by heat, fumigation of the area,
- b) the flammable liquid is discharged and during its evaporation a cloud of flammable vapours is formed, advancing in the direction of the wind, in the event of subsequent initiation, an explosion, fire and subsequent burning of persons or their injuries by pressure wave and debris flight, damage to property by heat, pressure wave or debris flight, fumigation of the area.
- c) in case of leakage of flammable liquids and substances hazardous to the environment, their penetration into sewers and watercourses may result in contamination of surface waters, in case of leakage into the rock environment, its contamination and subsequent contamination of groundwater may occur.

1.3 Release of toxic and noxious gases and vapours

Toxic and harmful gases and vapours can escape:

- a) to increase the concentration of a hazardous substance in the air above the permitted limit, to spread a toxic cloud of gases and vapours (without initiation) downwind to the company's premises or its surroundings and to subsequently poison (or irritate or burn the mucous membranes of) persons in the area of the harmful concentration (e.g. in the case of a chlorine or ammonia leak),
- b) explosion and fire in case of initiation of their mixtures with air, if in addition flammable gases and vapours are involved (The consequences of initiation are the same as in Article 1.1, e.g. in case of leakage of carbon monoxide, hydrogen sulphide or ammonia).

1.4 Leakage of toxic and harmful liquids

In case of leakage of toxic liquids and substances hazardous to the environment, their penetration into sewers and watercourses may lead to contamination of surface waters, while leakage into the rock environment may lead to its contamination and subsequent contamination of groundwater.

1.5 Leakage of nitrogenous substances

In the event of a leak of asphyxiating substances:

- a) in the gaseous state to displace air from the leakage area and consequently suffocate the occupants,
- b) in the liquid state, frostbite in affected persons, intense evaporation, spread of the gaseous cloud and the same consequences as in the gaseous state.

1.6 Leakage of corrosive liquids

In the event of a leakage of corrosive liquids:

- a) ...to splash and splash on the affected persons,
- b) to sewers, watercourses, and/or the upland environment and subsequent contamination of surface or groundwater and/or soil,
- c) to distort metal (structural) materials,
- d) contact of nitric acid with organic substances leads to their ignition and subsequent fire with consequences, see Article 1.1

1.7 Explosion of combustible dusts from operating equipment (polypropylene powder, polyethylene powder, carbon black, etc.) mixed with air

In the event of an explosion of combustible dusts mixed with air:

- a) to the destruction of the device (destruction),
- b) injury to persons by flying debris or pressure waves,
- c) a subsequent fire with the consequences as in Article 1.1.

1.8 Dropping objects

In the event of objects falling from a height when working on pipeline bridges or elevated workplaces, when handling objects using aerial work platforms and hoists, or due to climatic conditions (corrosion, frost), the following may occur:

- a) personal injury caused by falling objects,
- b) damage, destruction of equipment,
- c) to endanger road users.

1.9 Fugitive dust, particles, vapour emissions

In the event of flying dust, particles or vapour emissions:

- a) eye contact (damage),
- b) to endanger road users.

1.10 Rail and road transport

Due to the density of road and rail traffic (cars, trucks, trolleys, rail vehicles, bicycles), the following can occur:

- a) hit, bumped, pinched, crushed or bruised by road or rail users.

1.11 Communication

Due to the density of the roads and the possible defects on them, there may be:

- a) slipping, tripping, falling on flat ground - due to unclean, wet (spilled operating fluids, water, dirt) or uneven (uneven or damaged road surface) surface, poor footing
- b) slipping, tripping, falling on flat ground - due to weather conditions
- c) sinking or sliding - caused by poor securing of holes, depressions, sumps, grates, excavations, etc. on the road and in its vicinity.

1.12 Noise

Noise caused by the operation of technological equipment can cause hearing damage. Exceeding the permissible noise level may also be recorded during equipment breakdowns and planned activities, e.g. shutdowns of process equipment, purges, etc.

1.13 Sources of radioactive radiation

Sources of radioactive radiation in level meters, density meters and ash analyzers are present on the company's premises. The radioactive elements are Cs 137, Am 241 and Co 60. In the event of damage to this equipment, there may be a risk of exposure.

2 MEASURES

2.1 Knowledge of and compliance with generally applicable legislation and regulatory requirements.

2.2 Knowledge of and compliance with the binding internal regulations of ORLEN Unipetrol RPA, s.r.o. (especially Directive 402), published on the website (e-mail address: www.orlenunipetrolrpa.cz) "services and premises" block - CHEMPARK Záluží - binding standards and information and regularly acquaint oneself with their updates

2.3 Familiarise yourself with the general risks to the life and health of employees listed in Chapter 1. Knowledge of and adherence to the specified precautions.

2.4 Familiarise yourself with the more detailed specifications of the risks to the life and health of workers listed for each production site. Knowledge of and adherence to specified measures.

2.5 Completion of prescribed education and training as per the above requirements, including medical fitness.

2.6 Personal Protective Equipment (PPE) Standard

2.6.1

In the area of the production facility in the whole area under the management of ORLEN Unipetrol RPA, s.r.o., the risks of possible danger to life and health of persons defined in Chapter 1 cannot be completely excluded. For this reason, all persons who are present in the area are required to use the PPE specified in sections 2.6.2 - 2.6.8 of this article.

The provision does not apply to office spaces, command rooms, day rooms and spaces in buildings in which no production equipment is installed. The provision also does not apply to persons permanently residing in office buildings located on the premises, to persons entering such buildings on a one-time basis, and to the travel of persons to and from work (when traveling on a designated roadway).

PPE for the Company's employees is addressed under Directive S 415 "Personal Protective Equipment, Washing, Cleaning and Disinfecting Equipment and Protective Drinks".

PPE must conform to the relevant technical standards applicable to the type/type of PPE. The manufacturer's instructions must always be followed, even in relation to the work being carried out. The PPE used must be compatible with each other. It is forbidden to use damaged, modified, heavily soiled PPE or PPE that has exceeded its service life. PPE must always be used properly, i.e. goggles on, clothing fastened, chin strap on helmets fastened under the chin, etc.

With regard to the risks mentioned in Chapter 1, additional personal protective equipment is specified in the follow-up documentation dealing with the more detailed specification of the risks of the individual plants. This documentation identifies the specific locations requiring additional prescribed protection.

At the same time, the requirements for the use of PPE depending on the work to be carried out and the resulting risks above and/or beyond the established standards are not affected. This PPE is determined in the context of the permitting procedure under Directive 465 "Permit to Work" and Directive 435 "Permit to Work" for the Refinery units.

Exceptions to the above standard may be determined by the appropriate unit (production team) leader in conjunction with the company safety engineer. Incompatibilities between the various protective equipment specified in the standard and used by the recipient for its own operations shall be resolved through the permitting process in accordance with Directive 465 "Permit to Work" and Directive 435 "Permit to Work" for Refinery units.

2.6.2 Protective helmet with chin guard (more than 2 point attachment)

The protective helmet must meet the minimum requirements of ČSN EN 397 (or ČSN EN 14052) and be equipped/used with a chin guard (compatible according to the helmet instructions). It is forbidden to use as head protection devices according to ČSN EN 812.

It is not necessary to use a safety helmet in the case of welding where the welder is equipped with a welding hood or goggles. This exemption is only valid for the actual welding work for the time necessary.

It is no longer necessary to use a safety helmet in cases of poor access to the equipment or movement in the equipment where the working position makes it impossible to use the safety helmet safely.

In the case of entry into explosion hazardous areas, a protective helmet designed for such areas must be used, including additional accessories (lights, electronic hearing protection).

In the company's industrial premises, protective work helmets are used, differentiated by colour according to the individual groups of company employees and employees of other organisations.

Helmet colour resolution

Employees of ORLEN Unipetrol RPA s.r.o.:

White: investment staff, leaders at all levels of management

Red: health and safety department, fire prevention

Grey: visits

Green: other

Employees of contracting companies (contractors):

White: persons managing activities on the construction site (construction manager, inspection, design)

Red: persons supervising occupational safety and fire protection activities

Orange: persons managing activities in connection with the „Permit to work“ (receivers of „Permit to work“, persons taking over „Permit to work“)

Grey: visitors, excursions, practice

Yellow: others (does not apply to haulier drivers)

Note: A transition period is in place for the color differentiation of helmets to deplete existing stocks of purchased PPE. New purchases must be made in accordance with this requirement.

Depending on the nature of the work activities and on the basis of a risk assessment (to be performed by the employee's supervisor before work begins), the following may be permitted:

- work in low-voltage installations (helmet according to ČSN EN 50365),
- work at heights (helmet according to ČSN EN 12492).

2.6.3 Protective anti-static clothing with reduced flammability

The protective clothing must be certified as a whole according to ČSN EN ISO 11612 and ČSN EN 1149-5, including any patches. The protective clothing must be certified as a whole according to ČSN EN ISO 11612 and ČSN EN 1149-5, including any patches. The protective clothing must be made of inherent/permanent materials, the required properties must not be achieved by modifying the fabric of the clothing (ballast system, Proban, etc.).

The use of antistatic clothing with reduced flammability must be in accordance with the manufacturer's instructions, including maintenance and laundering of the clothing.

Protective anti-static clothing with reduced flammability has a recommended minimum weight of 200-220 g/m².

It is not allowed to use clothing as a substitute:

according to ČSN EN ISO 14116¹ - *Protective clothing - Protection against flame*

certified only according to ČSN EN ISO 11611 Protective clothing for use in welding and related processes,

made of anti-static fabrics with reduced flammability without certification of the workwear as a set.

In cases where it is necessary to use welding clothing (according to ČSN EN ISO 11611), the clothing must also be certified according to ČSN EN ISO 11612 and ČSN EN 1149-5. This does not apply to welding accessories used over protective clothing.

Where it is necessary to combine protective clothing (vests, raincoats, etc.), they must be worn in conjunction with protective clothing in accordance with ČSN EN ISO 11612, which must form the bottom layer of the work clothing. The outer protection used in this way must be certified to ČSN EN ISO 14116 as a minimum under these conditions.

Impregnation of antistatic clothing with reduced flammability is only permitted in accordance with ČSN EN 13034 (limited protection against liquid chemicals).

Other certifications (e.g. certification according to ČSN EN 342 Protective clothing - Cold protection kits and clothing components; EN 343 Protective clothing - Rain protection, etc.) are not restricted for so-called multinorm protective clothing when the above minimum requirements are met.

In general, it is not allowed to overlap the lower layers of clothing (hoodies, hoods, etc.) that do not have the appropriate certification according to ČSN EN ISO 11612 and ČSN EN 1149-5 from the protective anti-static clothing with reduced flammability. It is also forbidden to use over antistatic clothing with reduced flammability clothing that is not certified as protective clothing according to ČSN EN ISO 11612 and ČSN EN 1149-5, except for the exceptions specified in this document.

If the work requires the use of:

- a full-body suit (overalls) for protection against other risks - e.g. against excessive pollution or as protection against chemical substances - then it is necessary that it is certified at least according to ČSN EN 1149-5 and, if applicable, according to the relevant standard for the given risk. Such overalls/overalls must always be used over certified anti-static clothing with reduced flammability according to ČSN EN ISO 11612 and ČSN EN 1149-5.

- reflective vest, then it must be certified at least according to ČSN EN 1149-5, ČSN EN ISO 14116 (Protective clothing - Protection against flame - Limited flame spread materials, material assemblies and clothing) and the relevant standard for high visibility warning clothing for – ČSN EN 20471. Such a vest must always be worn over certified anti-static clothing with reduced flammability according to ČSN EN ISO 11612 and ČSN EN 1149-5.

Other exemptions for the use of combinations of antistatic clothing with reduced flammability and protective clothing which should be used as outer clothing over them and which are not simultaneously certified according to ČSN EN ISO 11612 and ČSN EN 1149-5 are not permitted.

The protective clothing of drivers (blouse and trousers or overalls) involved in loading/unloading of materials (the driver must wear a reflective vest and follow the safety instructions posted at the

¹ ČSN ISO 14116 This standard can only be used as an outer layer of clothing, e.g. for overalls, raincoats or vests, which must always be combined with the lower layer of clothing according to ČSN EN ISO 11612 and ČSN EN 1149-5.

loading/unloading site), except for activities in accordance with the provisions of the ADR, does not have to be of an anti-static design with reduced flammability. For these activities the driver must wear a reflective vest and follow the safety instructions posted at the place of loading/unloading.

Polo shirts, shirts, short/long-sleeved shirts are not allowed - only overalls are allowed in terms of use. During the summer months, this PPE may be used, but subject to the following conditions:

- The risk prevention competence of external contractors must carry out the hazard identification and risk assessment independently and guarantee their possible application with regard to the activities carried out by the contractor. For assessment, this guarantee of use must be sent to the Safety and Risk Prevention Department (BOZP@orlenunipetrol.cz) prior to the start of the use of these or similar devices. The Department of Safety and Risk Prevention, in agreement with the relevant director of the production unit, shall assess the suitability of the use of substitutes and issue an opinion.
- The use of these products is prohibited for activities that inherently pose a risk of potential exposure to chemicals during normal work activities, i.e. where the employee's body may be contaminated (e.g. product bottling, etc.). Furthermore, when opening equipment for the first time for repair or other activities with a direct risk of handling flammable substances.

At the same time, the requirements for the use of other types of clothing/body protection depending on the work to be carried out and the resulting risks are not affected.

Note: There is a transition period of 6 months from the publication of this document for the acquisition of new protective clothing under this mandatory standard.

2.6.4 Antistatic safety footwear

Protective antistatic safety shoes category S3 according to ČSN EN ISO 20345 (Personal protective equipment - Safety footwear), ankle boots, with reinforced toe and puncture resistant.

Antistatic footwear need not be used for inspection or attendance activities (external inspection bodies, visits, excursions, etc.). In these cases, it is necessary to wear sturdy and closed shoes and to move only in the areas defined by the head of the workplace or a designated escort.

In the event of additional hazards in specific workplaces, they must also provide protection against their effects, e.g. footwear category S5.

The footwear of drivers involved in the loading/unloading of materials (goods), apart from activities in accordance with the provisions of ADR (International Agreement concerning the carriage of dangerous goods by road), does not have to be anti-static. In such cases, sturdy and closed footwear must be used. Drivers must follow the operator's instructions and safety instructions posted at the loading/unloading site.

Drivers whose transport is subject to the ADR regime must wear sturdy, closed safety footwear of at least category S1 according to ČSN EN ISO 20345

At the same time, the requirements for the use of other types of footwear depending on the work to be carried out and the resulting risks are not affected.

2.6.5 Eye protection

The standard for eye protection is protective goggles against mechanical hazards with side covers according to ČSN EN 166 Personal eye-protection - Specifications. ČSN EN 170 Personal eye protection equipment is also a recommended standard.

Persons using dioptric spectacles must use protective goggles against mechanical hazards made for this purpose (goggles) or corrective goggles.

A protective shield or integrated variants (goggles, shield) to an industrial protective helmet are permitted alternatives.

When handling chemicals and mixtures it is necessary to comply with the requirements of the Safety data sheets.

Goggles are not required where employees are equipped with other eye protection incompatible with goggles against mechanical hazards (shield, welding hood, goggles for other protection, mask).

Persons performing the activities of a crane operator, signalman, binder or scaffolder may not use goggles in bad weather conditions (rain, drizzle, snow).

It is forbidden to use dark glasses in areas and objects where visibility may be impaired (closed containers, cellars, dark areas, etc.).

2.6.6 Hand protection

The standard for gloves is set according to ČSN EN 388 for mechanical hazards.

Depending on the nature of the work activities and on the basis of a risk assessment (analysis) (carried out by the employee's supervisor before starting work), the following may be permitted:

- ČSN EN 407 Protective gloves and other hand protective equipments against thermal risks (heat and/or fire)
- ČSN EN 374 protection against chemical and biological hazards + specifications in Safety data sheets
- gloves combining several standards

It is not necessary to use gloves when it is important to maintain sensitivity in the hands (good gripping properties) or when other hand protection is used.

2.6.7 Escape mask to protect against the effects of hydrogen sulphide, ammonia, chlorine dioxide and possibly other toxic substances - in designated zones

2.6.8 Hearing protection

Considering the risk of noise, which is specified in this documentation for specific workplaces, but due to possible malfunctions and unplanned shutdowns, short-term excess values of permissible noise intensity may occur outside these premises, it is necessary to have adequate hearing protection in standby mode, e.g. earplugs according to ČSN EN 352 and ČSN EN 458 Hearing protectors.

THE 3 MOST SIGNIFICANT HAZARDOUS SUBSTANCES ON THE COMPANY'S PREMISES

Type of hazardous substance	Grouping of the substance	Name of substance
Oxidizing	Liquid	liquefied oxygen
Liquefied extremely flammable gases	Liquid	hydrocarbons - methane, ethane, ethylene, propane, propylene, butenes (C ₄ fraction), propane-butane mixture (LPG)
Extremely flammable	Gas	hydrogen, C ₁ -C ₄ hydrocarbons, off-gases, synthesis gas, natural (fuel) gas
Extremely flammable toxic	Gas	carbon monoxide, hydrogen sulphide
Highly flammable	Liquid	benzene, bentol, ethylbenzene, gasolines (all types), C ₅ fraction, methanol, isopentane, hexane, isohexane, petroleum oil, toluene, BTX fraction
Flammable	Liquid	C ₉ fraction, C ₁₀ fraction, diesel fuel, kerosene, crude oil, separated oils,
Toxic	Liquid and gas	ammonia (ammonia), benzene, chlorine, methanol, chlorine dioxide
Asphyxiating (air displacing)	Liquid and gas	argon, nitrogen, carbon dioxide
Corrosive	Liquid	concentrated acids and alkalis and their aqueous solutions
Hazardous to the environment	Liquid	ammonia water, pyrolysis oils (gas, fuel), naphthalene concentrate, atmospheric residue, cracker. hydrocarbons, dimethyl disulfide, black/medium/vacuum distillate, sodium hypochlorite

Explosive	Solid	Coal dust, dust fractions of polyolefins
Radioactive		Cs 137, Co 60, Am 241 (caesium, cobalt, americium)

4 SYSTEMS AND MEANS OF COMMUNICATION, WARNING AND NOTIFICATION

The systems and tools of communication, warning and notification are defined by the directives 405 "Basic regulation for employees in the field of emergency and crisis preparation, the Chempark Záluží Litvínov area" and 405/1 "Basic regulation for employees in the field of emergency and crisis preparation, the Chemical Production Kralupy area".