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# MODULE G

## Work safety in welding flame

Safety and security at work



## And safety at work

- Governed by the CSN 05 0610 and the Decree of the Ministry of Interior no. 87/2000 Coll.
- Selected from the CSN 05 0610 and the Ministry of Interior no. 87/2000 Coll. :
- Basic risk when gas welding is the emergence and spread of fire, formation of toxic gases or explosion due to the effects of heat generated in the process.
- With this is related to basic safety precautions or special surveillance and fire.



## Permission to carry out welding work

- ▶ Permission to weld the persons who:
  - ▶ Have valid welding certificate.
  - ▶ Have qualifying for the appropriate method of welding,
  - ▶ Have mandate employers to perform welding work
  - ▶ Have a valid medical examination (under 50 years of age valid for 5 years, over 50 years of age, valid for 3 years)
  - ▶ Have valid certificate of additional training and examination 1x in two years.



## Welding work

- ▶ Welding workplace those spaces which are directly carried out welding and spaces which are not structurally separated with this place.
- ▶ Subject other regulations fire and sanitation.



## Conditions for the start of welding works

- Establishes and evaluates fire risk
- Define the powers and duties of persons to ensure fire safety.
- Lays down the conditions for safe movement of persons
- Evaluate the risks specific to the nature of work and operations.



## Welding flame must not be started if:

- ▶ Not specified fire safety measures
- ▶ Welder and participants in the process are clearly familiar with the terms of fire safety,
- ▶ Conditions are not met fire safety
- ▶ Welder can demonstrate their competence.





# Personal protective equipment welders

- ▶ Protection against burning
- ▶ Each welder is equipped with PPE so as to reduce the risk of burns.
- ▶ Leather apron, welding gloves, leggings, leather work boots.
- ▶ Protection against spatter is that the welder protect eyesight by using protective eyewear.
- ▶ Before other factors that arise during the process to protect welders sufficiently effective exhaust, using the corresponding filter into the glasses around disposition protects screens.



## Work with increased risk

- ▶ Working with an increased risk of such work, during which there is an increased risk of injury or permanent damage to health, fire or explosion.
- ▶ For evaluation of conditions in the workspace can be responsible welder.
- ▶ For this type of work is published written "command to weld."
- ▶ For exposure and compliance with the conditions specified in the command responsible authorized employee.





# Selection of the safety provisions of CSN 050610

- ▶ Ministry of Interior Decree 87/2000 Coll.
- ▶ Section 6
- ▶ Welding with the use of flammable gases
- ▶ §6 (1) During the welding flame mainly used oxygen, air, acetylene, hydrogen, liquefied petroleum gas, which is typically propane, butane or a mixture thereof (hereinafter referred to as "LPG"), natural gas and synthetic gas mixture MAPP.
- ▶ §6 (2) For pressure cylinders distribution of industrial gases and their accessories joint leakage and closures detect inflammable liquids (e.g., water with foaming agents) which do not contain fats and other substances that could cause a reaction.

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ *§6 (3) When moving the welding device must not leak unfired gas to work in a range of a dangerous concentration.*
- ▶ *§6 (4) When samples of acetylene cylinders check is performed optionally heating the bottle above 50 ° C. For the case of an exothermic reaction in a pressure bottle must be written procedures for handling cylinders starting from the conditions given by the manufacturer or importer.*
- ▶ *§6 (5) Transport cylinders of acetylene welding station to be a collection of acetylene commence earlier than after 1 hour. This condition need not be met, provided that the bottles are transported in an upright position and were laid before use. Bottle in acetylene sampling must be in the vertical position or tilted at an angle valve upwards least 30 degrees from horizontal.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ Section 6 (6) In the event of a fire on the welding work on which are placed cylinders and other pressure vessel welder or other gases or in dangerous proximity to the workplace occur, it is immediately removed to a safe place. Preferably, the removed full cylinder and the other full pressure vessel. To determine the specific procedure is based on the fire safety requirements specified by the manufacturer or importer. If you can not make such manipulation, reports the emergency fire protection unit, which cylinders and pressure vessels and their contents are found in a burning or danger zone.

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ §6 (7) when handling pressurized oxygen cylinders and their accessories for oxygen must be avoided:
  - ▶ a) Fats and their pollution substances or materials containing fats
  - ▶ b) Use of materials satisfying the fire safety conditions according to the type of welding technology.
- ▶ Section 6 (8) Cylinders at welding workplaces secure against falling, overturning or rolling away. The security method is chosen to allow their easy and safe release. Cylinder when welding work is placed at a fixed location so as not to endanger conveying or transport means, in moving parts or any moving material or lose its displacement.

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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## Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (9) of the welding work in the hazardous fire or explosion followed by a fire can not be stored cylinders designed for welding work.*
- ▶ *§6 (10) Cylinder of flammable gas can be placed only where in the event of gas leakage is eliminated in a dangerous concentration.*
- ▶ *§6 (11) Unloading the cylinders and other pressure vessels can accelerate the direct heating of the bottles open flames or other heat sources which admits instructions of the manufacturer or importer. The operator provisions shall specify the form of the heating surface temperature and which are allowed for a specific content of cylinders and pressure vessels.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (12) Skip liquefied petroleum gas and acetylene, dissolved under pressure is permitted only to authorized organizations.*
- ▶ *§6 (13) Ignites when the gas escaping through leaks reducing valve, bottle valve, hoses and other fittings, the cylinder valve was immediately closed and the flame extinguishes.*
- ▶ *§6 (14) At the back lash and the flame inside the burner immediately close the valves combustible gas and oxygen to the burner and the burner is cooled.*
- ▶ *§6 (15) Entering a flame tube and into the reduction valve immediately closes the cylinder valve on a cylinder of inflammable gas and then oxygen bottles. The burner can be ignited only after removal of the causes and consequences of backfire.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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## Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (16) Fire safety distance between pressure cylinders of welding equipment using flammable gases and flames on the workplace is less than 3 meters if the manufacturer or importer for the specific device sets a different distance as safe.*
- ▶ *§6 (17) If the welding work to perform welding work using multiple combustible gas welder devices placed in cylinders at a distance of at least 3 m from each other or are separated by a fireproof rigid wall, which exceeds the height of the set of at least 0.2 mA sets a width of at least 0.1 m.*
- ▶ *§6 (18) For welding with the use of flammable gas used welding hose coded for combustible gases and oxygen. The shortest hoses and hose portion is at least 5 m long, without adjusting the connections; other length is admissible only if so stipulated by the manufacturer or importer for the specific device.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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## Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (19) Cylinders for welding can not be placed into the working pit.*
- ▶ *§6 (20) Sampling points on acetylene acetylene pipes shall be provided with dry or water reservoir. Protective distance from the flame of the water reservoir is at least 3 mA master dry protection distance is at least 1 m.*
- ▶ *§6 (21) During the welding with acetylene considered hazardous area with subsequent fire.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (22) Portable acetylene for welding can be used only*
  - a) *In well ventilated areas with a minimum volume of 100 m<sup>3</sup>; in the case of other technical solutions must prove that achieve at least the same level of fire safety*
  - b) *Showing the locations of generator safety tables,*
  - c) *Safe protection against manipulation with the device.*
- ▶ *Section 6 (23) To manipulate open fire in the distance of 3 m from a portable generator is not permitted if the manufacturer or importer otherwise.*
- ▶ *§6 (24) When repairing acetylene welding these generators considered explosive container to fire.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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## Selection of the safety provisions of CSN 050610

- ▶ *§6 (25) After the weld time must be in sight cylinder welders or other persons involved in the welding.*
- ▶ *§6 (26) During the welding of the cylinder consumption of propane-butane in vapor phase only possible if the bottle is upright, cap up. Subscribe propane-butane in the gas phase or liquid phase from a gas cylinder in a non-upright position can be only in the event that such documentation allows the manufacturer or importer.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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# Selection of the safety provisions of CSN 050610

- ▶ *Section 6 (27) Cylinders for transport to the workplace closed vehicles must unload before starting welding. The mobile workshops and mobile laboratories cylinders can remain even for welding under conditions that*
  - a) *The vehicle is not more than two cylinders from which gas is withdrawn, and the two storage cylinders,*
  - b) *They are placed at the entrance to the storage compartment of the vehicle,*
  - c) *They are separately mounted device which can be easily released,*
  - d) *the collection of the gas may be in the vehicle performed no work,*
  - e) *On the floor of the installation room can not be closed bottles vent aperture size of at least 0.01 m<sup>2</sup> and a further aperture size of at least 0.01 m<sup>2</sup> is in the roof of the vehicle, or just below it,*
  - f) *In the vehicle body is not stored substances or materials that have a tendency to spontaneous combustion,*
  - g) *In the vehicle body is not stored flammable substances or materials, together with an ignition source,*
  - h) *The vehicle is equipped with at least one portable fire extinguisher powder extinguishing agent with a weight of 5 kg or positioned so as to be accessible from the outside.*

Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000.

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## Questions to ponder

1. What safety standard applies to gas welding?
2. What is the minimum allowable length of welding hose?
3. In what way it is necessary to ensure the bottles from falling?
4. How far can the bottles from the open fire?
5. After what time it is necessary to undergo a medical examination for persons over 50 years?
6. What applies for additional training on occupational safety?
7. In what cases may not begin welding flame?





## Recommended literature and information sources

- ▶ ČSN 05 0610 Zváranie. Bezpečnostné ustanovenia pro plameňové zváranie kovov a rezanie kovov. Praha: Český normalizační institut, 1993. Třídící znak 050610.
- ▶ Vyhláška Ministerstva vnitra č. 87/2000 Sb., kterou se stanoví podmínky požární bezpečnosti při svařování a nahřívání živců v tavných nádobách. Praha: 2000. <http://multimedia.ebozsp.cz/document/get/eb2415fc20fb45e146a55d6c6e7ca9d78bff7448>