# Regulations of 25 April 2002 No. 422 on welding, welding equipment, hot work and storage of gas cylinders on board ship

**Legal basis:** Laid down by the Norwegian Maritime Authority on 25 April 2002 under the Act of 9 June 1903 No. 7 relating to public control of the seaworthiness of ships, etc. Legal basis amended to Act of 16 February 2007 No. 9 relating to ship safety and security (Ship Safety and Security Act) sections 2, 9, 11, 21, 22, 28, 28a, 29, 43 and 45, cf. Formal Delegation of 16 February 2007 No. 171, Formal Delegation of 31 May 2007 No. 590 and Formal Delegation of 19 August 2013 No. 1002 and Act of 26 June 1998 No. 47 relating to recreational and small craft sections 23 and 25, cf. Formal Delegation of 27 November 1998 No. 1095, Formal Delegation of 1 December 1998 No. 4532 and Formal Delegation of 31 May 2007 No. 591.
**EEA references:** EEA Agreement Annex II Chapter XIX point 1 (Directive 98/34/EC).
**Amendments:** Amended by Regulations of 17 December 2004 No. 1857 (i.a. title), 29 June 2007 No. 1006 (i.a. legal basis), 19 August 2013 No. 1036, 20 December 2017 No. 2379, 26 June 2025 No. 1372.

## Chapter I
## General provisions

### Section 1
### *Scope of application*

(1) Chapters I, IV and V shall apply to all Norwegian ships irrespective of size. For mobile offshore units, the Regulations of 11 April 2003 No. 480 on welding equipment, etc. for the welding gases acetylene and oxygen in mobile offshore units, shall apply.

(2) These Regulations also apply to the storage of other gases under pressure on board ship for other purposes than welding, where no other particular regulations apply.

(3) Unless otherwise provided herein, Chapter III shall apply to all ships that have fitted a central plant on or after 1 September 1977. Ships that have fitted a central plant before 1 September 1977 shall in addition comply with the following provisions of these Regulations: section 15 first, second and fourth paragraphs; section 16 first paragraph subparagraph c) and third paragraph subparagraph d); section 18 second and third paragraphs; and sections 19, 20, 22 and 23.

(4) When equipment or installations are replaced in ships with an existing central plant, the other provisions herein shall apply.

(5) Chapters II and IV of these Regulations shall not apply during stays in port and shipyards in Norway, where the Working Environment Act and regulations laid down pursuant to this Act, shall apply.

(6) During stays in port or shipyards abroad, Chapter II of these Regulations shall not apply to the extent that the authorities of the country concerned have laid down rules or regulations for such welding work, unless the master considers the safety measures to be inadequate.

Amended by Regulations of 17 December 2004 No. 1857 (in force on 1 January 2005), 29 June 2007 No. 1006 (in force on 1 July 2007).

### Section 2
### *Definitions*

For the purpose of these Regulations, the following definitions shall apply:

a) "*Acetylene*": $C_2H_2$ for storage on special gas cylinders (15 to 19 bar at 15°C).

b) "*Recognised classification society*":
   1. American Bureau of Shipping (ABS)
   2. Bureau Veritas (BV)
   3. DNV GL
   4. Lloyd's Register of Shipping (LRS)
   5. Rina Services S.p.A (RINA)
   6. Nippon Kaiji Kyokai (Class NK).

c) "*Existing central plant*": Central plant installed before 1 July 2000.

d) "*Liquid chemicals*": Cargoes with an absolute vapour pressure not exceeding 2.8 bar at 37.8°C which constitute a fire risk and health hazard.

e) "*Liquefied gases*": Cargoes with an absolute vapour pressure of 2.8 bar or higher at 37.8°C which constitute a fire risk and health hazard.

f) "*Qualified person*": Person with qualifications to install, test and check a central plant and issue an Installation Certificate.

g) "*New central plant*": Central plant installed on or after 1 July 2000.

h) "*Inert atmosphere*": Atmosphere which is mixed with inert gas so as to lower the oxygen content to a volume percentage not exceeding 8.
i) "*Oxygen*": $O_2$ for storage in special gas cylinders (150 or 200 bar at 15°C).
j) "*Oil*": 'Oil' shall be taken to mean:
   1. mineral oils having a flash point of 60°C or above, such as diesel oils, solar oil, heating oil, lubricating oil and similar oils which emit combustible gases when heated.
   2. mineral oils with a flash point below 60°C, such as petrol, petroleum, benzene and crude oil, or any other flammable liquid the flash point of which is below the limit referred to above.
   3. animal or vegetable oils or greases, such as whale oil, ground nut oil, linseed oil and similar oils or greases which emit combustible gases when heated.
k) "*Crude oil*": Any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:
   1. crude oil from which certain distillate fractions may have been removed; and
   2. crude oil to which certain distillate fractions may have been added.
l) "*Slop*": oil-bearing water from tank washing.
m) "*Tanker in service*": Any tanker not lying at a yard to undergo repairs or other work.
n) "*Tanker*": Cargo ship constructed or outfitted for the carriage of flammable liquid cargoes in bulk.
o) "*Hot work*": work that involves the use of open flames in connection with welding, high temperature or the use of spark-emitting tools.

Amended by Regulations of 17 December 2004 No. 1857 (in force on 1 January 2005), 20 December 2017 No. 2379 (in force on 1 January 2018).

## Section 3
### *Duties*

The company, employer, master and other persons working on board shall perform their duties in accordance with the Ship Safety and Security Act and the supplementary provisions laid down in these Regulations.

Amended by Regulations of 29 June 2007 No. 1006 (in force on 1 July 2007), 19 August 2013 No. 1036 (in force on 20 August 2013).

## Section 4
### *Exemptions*

The Norwegian Maritime Authority may, in individual cases and upon written application, grant exemption from the requirements of these Regulations. There must be special reasons that make the exemption necessary and it must be justifiable in terms of safety. Exemptions can only be granted where they do not contravene international agreements to which Norway has acceded.

## Section 5
### *Approval*

(1) Gas cylinders and other equipment shall be approved by a recognised classification society or other public authority. Cylinders of greater volume than 50 litres are not permitted.

(2) The requirements of Chapter III of these Regulations shall not apply to products originating in States which are Contracting Parties to the EEA Agreement, where such products comply with:

a) a standard or code of good practice issued by a national standards body or by an equivalent entity in a State of one of the Contracting Parties to the EEA Agreement and adhered to by law in that State; or
b) a relevant international standard the application of which is authorised in one of those States; or
c) a technical regulation the application of which is obligatory in respect of manufacturing, marketing or use in one of those States; or
d) conventional or innovative manufacturing processes pursued by law in a State of one of the Contracting Parties to the EEA Agreement and for which sufficiently detailed technical documentation exists to ensure that the products in question can be assessed in the light of the application indicated, where necessary on the basis of additional tests, provided that the standard, code of good practice, technical regulation or process in question is capable of ensuring a level of protection equivalent to that which these Regulations seek to provide. If necessary, particular information on safety and the protection of life and health, etc. shall be provided.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 6
### *Documentation*

(1) Drawings of central plants shall be made well in advance of the commencement of the installation work. The drawings shall clearly indicate the proposed installations of equipment and piping, and shall contain all the necessary data in compliance with the requirements of these Regulations. The drawings and relevant documentation shall at all times be available upon board.

(2) The company shall be able to document that the requirements of these Regulations are complied with. Documentation shall be sent to the Norwegian Maritime Authority upon request. The contents, scope and type of documents and the time of submission shall be decided by the Norwegian Maritime Authority.

Amended by Regulations of 17 December 2004 No. 1857 (in force on 1 January 2005), 27 June 2007 No. 1006 (in force on 1 July 2007).

## Section 7
### *Qualified person*

The qualified person shall comply with the following requirements:

a) possess all necessary qualifications for the installation of piping and equipment in ships;
b) have special knowledge about the problems and safety precautions associated with installing, testing, checking and using central plants and practical experience in this area;
c) use, during the installation, the accessories, drawings and directions of the equipment vendor;
d) hold the approval of a recognised classification society.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 8
### *Safety instructions in relation to hot work and the use of welding equipment*

(1) The ship shall have instructions on hot work and the use of welding equipment on board. It shall be evident from the instructions who is responsible for the control and maintenance of the welding equipment, who is permitted to perform welding and which safety measures are to be implemented during welding operations. The master shall make sure that all welding personnel on board are acquainted with the instructions.

(2) All personnel using the welding equipment shall have completed the necessary training for the use of such equipment.

(3) All personnel using the welding equipment shall wear the necessary protection gear. Particular precautions shall be taken when welding in confined spaces, the necessary ventilation shall especially be carried out prior to, and during welding. Particular precautions shall also be taken in regard to high temperature or a high degree of dampness.

(4) During welding and hot work outside of the ship's workshop, the welder shall be assisted by a watcher, who shall wear the necessary protection gear as well.

Amended by Regulations of 17 December 2004 No. 1857 (in force on 1 January 2005), 27 June 2007 No. 1006 (in force on 1 July 2007).

# Chapter II
# Welding and other hot work

Headline amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 9
### *Washing and gas freeing*

(1) Ships which have carried cargo with a flash point below 60°C.

a) Before starting welding or burning work, other work involving use of open flames or other spark-emitting work, the following shall be carried out:

1. Ships equipped with inert gas system and system for crude oil washing (COW).

1.1. At the last unloading of crude oil, tanks in which work is to be carried out and adjacent tanks shall be washed with crude oil.

1.2. Tanks or spaces in which work is to be carried out, and all adjacent tanks or spaces, shall then be washed with water until a satisfactory degree of cleanness is achieved. The washing shall take place in an inert atmosphere. Piping, valves, filters and pumps shall be cleaned. After venting, cleaning in accordance with section 10 first paragraph shall be carried out. Pump rooms and cofferdams shall be cleaned and vented.

1.3. Slop tanks shall, to the extent possible, be emptied and cleaned. Where a slop tank is immediately adjacent to the tank or space in which work is to be carried out, the slop tank shall be emptied

and cleaned. Where the slop tank is not immediately adjacent to the tank or space in which work is to be carried out, the slop tank may contain slop. The tank shall have an inert atmosphere, and the inert gas pressure shall not be lower than 500 mmVS.

1.4. Tanks directly adjacent to the tank where the work is to be carried out shall be empty and cleaned in accordance with section 10 first paragraph. The other tanks or spaces of the ship shall have an inert atmosphere, their oxygen content shall not exceed 8%, and the inert gas pressure shall not be lower than 500 mmVS.

2. Ships not equipped with inert gas system and COW.

2.1. Tanks and spaces shall be washed with water (max. 60°C) followed by venting of all tanks and spaces including valves, filters, pumps, etc. Pump rooms and cofferdams shall be cleaned and aired. If not filled with $CO_2$ or another form of inert gas, the slop tank shall be emptied and cleaned. The oxygen content shall not exceed 8%, and the inert gas pressure shall not be lower than 500 mmVS.

2.2. All empty cargo tanks shall be cleaned in ships without an inert gas system. Slop shall be pumped to the tank which is located at the greatest possible distance from the work area. The tank shall be kept closed.

2.3. The other cargo tanks and spaces shall be cleaned and free of gas in accordance with section 10 first paragraph.

2.4. All cargo tanks, pump rooms and cofferdams shall be examined with two explosimeters, which shall be type-approved.

(2) In ships which have carried cargo oil or fuel oil with a flashpoint of 60°C or above, or oil or grease as defined in section 2 (j) (3), washing and venting and control as mentioned in the first paragraph above may be limited to those tanks and spaces where work is to be carried out, and to cleaning in adjacent spaces or tanks. However, hatches and openings to tanks and spaces which are not cleaned shall be kept closed.

(3) In ships which have carried liquefied gases, tanks and spaces in which work is to be carried out and adjacent tanks or spaces shall be washed with water. However, washing may be omitted if the gas may be completely removed by venting or airing. Control of gas shall be carried out by means of an explosimeter calibrated for the gas in question.

Amended by Regulations of 17 December 2004 No. 1857 (in force on 1 January 2005), 20 December 2017 No. 2379 (in force on 1 January 2018).

## Section 10

### *Cleaning – continuous control*

(1) Before hot work is commenced in tanks or spaces which have contained oil or liquefied gases, in addition to the washing and cleaning, the tank bottom and construction elements shall be thoroughly cleaned. Checklists of such work shall be available, and a copy of each completed checklist shall be kept on the bridge.

(2) Adjacent tanks or spaces shall be cleaned in the same way as the space in which work is carried out. If the ship is not equipped with an inert gas system and COW system, all of the ship's tanks shall be cleaned in the same way as the tank in which work is to be carried out.

(3) Pipes and valves in tanks in which hot work is to be carried out shall be cleaned.

(4) The atmosphere in the tank or space in which work is to be carried out, as well as adjacent tanks, shall be checked immediately prior to commencement of hot work. In the course of the work, measurements shall be performed at least every second hour in the first 24 hours. If these measurements show that there has been no gas development during this period, the gas measurements may then be reduced to every fourth hour.

(5) If the ship on the preceding voyage has carried oil with a flash point below 60°C or liquefied gases, similar gas measurements shall be performed in adjacent spaces or tanks.

(6) Welding or burning work, other work involving use of open flames or other spark-emitting work shall be discontinued when pipes or valves are dismantled or have been opened. Before work is resumed, gas measurements shall be carried out as mentioned in the fourth paragraph above.

(7) As regards tanks in which chemicals have been carried, precautions shall be taken with regard to possible danger of poisoning because of gases produced by heating. Furthermore, precautions shall be taken with regard to tank coatings which may give off noxious gases when heated.

(8) Precautions shall be taken with regard to explosive gas which has originated because of use of anodes before descaling of tanks.

(9) In permanent ballast tanks in tankers, gas measurements shall be carried out as gas may have gathered at the bottom of such tanks because of leakages.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 11

*Welding, use of open flames, etc.*

(1) Subject to the limitations stated in the third and fourth paragraphs below, welding or burning work, other work involving use of open flames or other spark-emitting work may be carried out on board, provided cleaning has been carried out and the provisions of section 10 are complied with in all respects.

(2) Welding or use of open flames on board ships which have carried cargo with a flash point below 60°C, shall only be carried out when necessary to maintain the safe operation of the ship. Such work is not subject to these provisions if carried out in an engine workshop or another room specially designed for such work.

(3) For ships equipped with an inert gas system, minor welding work may be permitted outside the tank area provided the tanks are filled with inert gas. The distance from the gas hazardous area to where the welding is to take place shall be at least 10 m.

(4) During work in enclosed spaces, good ventilation must be ensured. The ventilation system shall have a capacity of at least one change of air per hour.

(5) Minor external work operations, such as welding of clips, pipe holders, doubling plates or small seatings direct on to a tank or space which has contained oil with a flash point of 60°C or above may after careful consideration by the master be carried out without previous cleaning. It is a condition that there is no danger of burning through and that the tank is filled with water to a level of at least 50 cm above the place which is heated.

(6) When welding or burning work, other work involving use of open flames or other spark-emitting work is to be carried out on hollow spaces such as rudders, bilge keels, etc. which contain oil or other anti-corrosive medium capable of giving off explosive gas when heated, the oil shall be emptied and the hollow space filled with water or inert gas. Inert gas shall be supplied continuously.

(7) During the loading or discharging or cargo with a flash point below 60°C and of liquefied gases, the use of open flames in machinery and boiler spaces except for the regular fireplaces shall only take place after careful consideration by the ship's master and chief engineer.

(8) During the work, suitable fire-extinguishing equipment shall always be available. Fire extinguishers shall be at hand, and in the case of major work the fire main shall be under pressure and a fire watch shall be posted.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 12

*Examinations*

(1) Gas measurements and examinations in connection with cleaning and gas freeing shall be carried out by an officer together with the ship's protection supervisor. They shall have completed an approved training course in accordance with the provisions currently in force at any time on requirements for the training and qualifications of personnel on tankers.

(2) The results of such examinations shall be entered in the ship's deck log.

(3) During the preparations for welding or burning work other work involving use of open flames or other spark-emitting work, the following shall always be checked:

a) Type of oil having been carried in the tank(s) in which welding or work with open flames is to be carried out. Types of oil having been carried in adjacent tanks.
b) Types of liquefied gas or liquid chemicals having been carried in the tanks or in the vicinity of the place where welding is to be carried out.
c) Extent of cleaning carried out in tanks or spaces.
d) Extent of cleaning carried out in adjacent tanks or spaces.
e) Measures for ventilation before work.
f) Gas measurements performed in tanks and spaces where work is to be carried out, and in adjacent tanks or spaces.
g) Results of gas measurements prior to and during work operations.
h) Availability of fire-extinguishing appliances and other safety equipment.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

# Chapter III
# Welding equipment, etc. for the welding gases acetylene and oxygen

## Section 13
### *Central plant*

(1) Central plants shall be installed when the number of gas cylinders on board containing acetylene and/or oxygen exceeds 4. This requirement applies regardless of cylinder size.

(2) Central plants shall consist of a gas cylinder central fitted with a non-return valve for each gas cylinder, high-pressure hoses, manifold, stop valves, regulators, and pipes with outlet stations. All parts of the plant shall comply with the provisions of these Regulations.

(3) Any plant with permanently fitted pipes for acetylene and oxygen shall be considered a central plant, even if the number of gas cylinders is 4 or lower. All parts of such plants shall also comply with the provisions of these Regulations.

## Section 14
### *Gas cylinder central*

(1) The gas cylinder central shall be a separate room for the storage and connection of acetylene and oxygen cylinders. The room shall have a bulkhead, deck and ceiling made of steel and be gas-tightly separated from adjacent spaces. The gas cylinder central shall be located on or above the uppermost continuous deck and have direct access to the open deck.

(2) The gas cylinder central shall be so insulated, ventilated and arranged that the temperature will not normally exceed 40°C. Where the location of the room and the temperature allow, natural ventilation may be used. Materials used in connection with insulation, etc. shall be of an incombustible type. The ventilation arrangement shall not be connected to other ventilation systems on board. In addition, the room shall be ventilated in such a way that there is no risk of gas accumulation. Safety valves and similar devices shall have a vent point in a safe place on the open deck, see section 16 first paragraph (d).

(3) The room shall not be used for other purposes than gas cylinder storage. Pipelines for combustible liquids and gases shall not penetrate the gas cylinder central.

(4) Where the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders does not exceed 8, both gases may be kept in the same room.

(5) Where the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders exceeds 8, the gas cylinder central shall consist of two gas-tightly separated rooms, one for acetylene and one for oxygen.

(6) Gas cylinder centrals shall be clearly marked with signs showing that oxygen and acetylene cylinders are stored in the central. The text of the sign shall be as prescribed by section 22 first paragraph.

(7) Electrical installations shall satisfy the regulations currently in force on the installation of electrical components in spaces with a gas hazard.

## Section 15
### *Gas cylinders, accessories, etc.*

(1) Gas cylinders and spare cylinders, including oxygen cylinders for medical use, shall be placed in erect position and securely fastened in an appropriate location. The fastening arrangement shall be so designed that a rapid disconnection of cylinders may be carried out.

(2) Storage of cylinders containing flammable gases under pressure in the engine-room is not permitted.

(3) Burners, stop valves, regulators, non-return devices, high-pressure pipes and other accessories in connection with the welding equipment shall be of makes that comply with relevant standards, cf. section 17.

(4) When the central plant is not in use the gas cylinder valves and the other valves shall be kept closed.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 16
### *Piping installations, etc.*

(1) *High-pressure side. Piping and accessories between gas cylinders and regulator.*

a) Acetylene pipes.

Pipes shall be of stainless steel. All pipes shall be seamless. Piping and accessories shall have a 300-bar certificate.

Copper or copper alloys containing more than 65% of copper shall not be used in connection with acetylene.

In central plants where two or more cylinders of acetylene are connected to a manifold, the supply pipes between the cylinders and the manifold shall be fitted with non-return valves that comply with relevant standards, cf. section 17.

b) Oxygen pipes.

Pipes shall be of stainless steel or copper. All pipes shall be seamless. Piping and accessories shall have a 300-bar certificate.

In central plants where two or more cylinders of oxygen are connected to a manifold, the supply pipes between the cylinders and the manifold shall be fitted with non-return valves that comply with relevant standards, cf. section 17.

c) The pressure test shall be carried out by a qualified person.

d) Safety valves and similar devices fitted in a gas cylinder central shall have a vent point on the open deck. The vent point shall be in a safe place at a height of minimum 3 metres above deck. The location of the vent point shall be marked as prescribed by section 22 fifth paragraph.

(2) *Low-pressure side.*

a) Pipes shall be seamless, made of ST 35 material with a wall thickness of minimum 2.0 mm or equivalent and/or in conformity with the requirements of a recognised classification society. Pipes on the open deck shall have a thickness of at least 2.5 mm.

b) Pipelines shall be laid freely and be so arranged that they are protected against damage. They shall not penetrate unventilated rooms, lockers, etc. or be laid in crew or passenger accommodation.

c) Expansion loops shall be placed where necessary and piping that penetrates a deck or bulkhead shall be sheathed in protection tubes of hard plastics or fibre material. All pipes shall be securely fastened so as to be protected against damage. The distance between fastening clamps shall not exceed 2.5 metres.

d) Pipelines shall be laid with as few joints as possible. In new installations, joints shall be expertly welded with a TIG or acetylene/oxygen unit. In existing installations, joints shall be expertly welded end to end. Joints shall be fitted in places readily accessible for inspection.

e) Disconnectable couplings are not accepted as a substitute for welded joints.

(3) *Outlet stations.*

a) An outlet station is a bracket with stop valves, regulators, manometer, and non-return devices for acetylene and oxygen located in a cabinet or otherwise satisfactorily protected.

b) Two outlet stations are permitted in every piping installation from a gas cylinder central.

c) Outlet stations are only permitted in engine-rooms and/or workshops. They shall be located in a well ventilated place and in such a way as to be protected against mechanical load.

d) The stop valves of outlet stations shall be closed when the system is not in use.

## Section 17

## *Requirements for equipment and installations*

Equipment and installations of new central plants shall conform to the following standards:

a) NS-EN 730 Gas welding equipment. Equipment used in gas welding, cutting and allied processes, safety devices for fuel gases and oxygen or compressed air. General specifications, requirements and tests.

b) NS-EN 961 Gas welding equipment. Manifold regulators used in welding, cutting and allied processes up to 200 bar.

c) NS-EN ISO 14113 Gas welding equipment. Rubber and plastic hoses assembled for compressed or liquefied gases up to a maximum design pressure of 450 bar.

d) NS-EN ISO 2503 Gas welding equipment. Pressure regulators for gas cylinders used in welding, cutting and allied processes up to 300 bar (ISO 2503:1998).

e) NS-ISO 9090 Gas tightness of equipment for gas welding and allied processes.

f) NS-ISO 9539 Materials for equipment used in gas welding, cutting and allied processes.

g) EN ISO 14114 Gas welding equipment. Acetylene manifold systems for welding, cutting and allied processes. General requirements.

## Section 18

## *Installation, testing and checks of central plants*

(1) *Installation of a central plant.*

a) Prior to the installation of acetylene and oxygen pipelines, piping as well as connections shall be thoroughly cleansed to remove all grease, oil and other combustible substances. No combustible or organic solvent may be used for this purpose. After the degreasing, pipelines and connections shall be blown clean with fat-free nitrogen, both prior to and after the installation.

b) Compressed air from an oil-lubricated compressor or oxygen shall not be used.

(2) *Blow-through and non-leakage testing after the installation, etc.*

a) After completed installation or repairs of the central plant and otherwise at 5-year intervals, cf. section 19, all pipelines shall be blown through and be non-leakage tested.

b) Blow-through of acetylene and oxygen piping shall be carried out with fat-free nitrogen. Nitrogen shall be blown in from the high-pressure side and be carried off at the outlet station. The outlet station(s) shall be removed during the blow-through process. At blow-through, the pressure shall be gradually increased to approximately 12 bar and the blow through process shall continue till dirt no longer escapes from the pipe. High-pressure pipes shall be blown through separately.

1. *Low-pressure side.*

1.1. Fat-free nitrogen shall be used for non-leakage testing of acetylene and oxygen piping and the test pressure shall be 12 bar. After 8 hours, the pressure drop shall not exceed 0.4 bar.

2. *High-pressure side.*

2.1. Acetylene piping on the high-pressure side shall be non-leakage tested with fat-free nitrogen at 25 bar.

2.2. Oxygen piping on the high-pressure side shall be non-leakage tested with 200-bar oxygen or fat-free nitrogen.

3. *Common provision.*

3.1. All valves, joints and other connections shall be checked for leakage by appropriate means.

(3) *Checks.*

a) Blow-throughs and non-leakage tests as mentioned in the second paragraph shall be performed by a qualified person.

b) Non-leakage testing of pipelines shall be carried out by the chief engineer officer or a person authorised by the chief engineer officer at least once a year using the ordinary operating pressures for oxygen and acetylene, respectively. The gas supply to the pipelines is stopped by the central regulator being closed and the pressure in the pipelines shall then remain constant for at least eight hours. If pressure drop should occur in oxygen and/or acetylene pipelines the central plant shall be checked and repaired by a qualified person and a new Installation Certificate shall be issued. The annual test shall be entered on the Installation Certificate in the gas cylinder central.

Amended by Regulation of 26 June 2025 No. 1372.

## Section 19

### *Installation Certificate*

(1) After a central plant has been installed, tested and checked by a qualified person, an Installation Certificate shall be issued the text of which is prescribed by the Norwegian Maritime Authority. The certificate shall be issued by the qualified person responsible for the installation and inspection of the plant. The person who issues the Installation Certificate shall sign it to certify that the plant is checked and tested as prescribed and that the plant also complies with the other provisions of these Regulations.

(2) The Installation Certificate shall be issued for a period of maximum 5 years. The certificate is invalidated if the plant is altered of has suffered such damage as may affect its functionality or safety.

(3) Before the 5-year period expires, the plant shall be re-tested and re-inspected by a qualified person and a new Installation Certificate shall be issued. For classed ships, a recognised classification society may issue the certificate when the shipping company and the classification society concerned have jointly inspected the plant. The Installation Certificate shall be clearly marked: “Renewal of Installation Certificate”.

(4) Following damage, alterations or renewals affecting important parts of the plant, it shall be re-tested and re-inspected by a qualified person and a new Installation Certificate shall be issued. The Installation Certificate shall be clearly marked: “Renewal of Installation Certificate”.

(5) The Installation Certificate (the original) shall be posted in the gas cylinder central and be so framed as to allow it to be removed for entries of annual inspections.

(6) A copy of the Installation Certificate shall be kept for at least 6 years by the person who issued it and the shipping company.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 20

### *Transportable welding equipment*

(1) Portable welding equipment consists of one cylinder for oxygen and acetylene respectively, regulators, non-return devices, hoses, burners, etc. placed in a suitable transportable appliance. The volume of the cylinders shall not exceed 50 litres. Only one spare cylinder is accepted for acetylene and oxygen respectively.

(2) In ships provided with a central plant, portable welding equipment shall, when not in use, be stored in a rack in the gas cylinder central. The total number of acetylene and oxygen bottles in one room shall not exceed eight, including cylinders used for portable welding equipment.

(3) In ships not provided with a central plant, transportable welding equipment and spare cylinders shall, when not in use, be kept in a fixed position in a separate and well ventilated room on or above the uppermost continuous deck. This room shall be gas-tightly separated from other rooms.

## Section 21

### *Special plant*

(1) In ships where welding and/or burning is carried out as a service to others, such as pipelay vessels, crane vessels, engineering ships and drillships used for any purpose other than drilling for subsea petroleum deposits, a plant may be installed in accordance with this provision (special plant).

(2) In cases of doubt, the Norwegian Maritime Authority shall decide whether this provision applies to a particular ship.

(3) Special plants may only be used for work carried out as a service to others.

(4) These Regulations shall apply to special plants with the following modifications:

a) The gas cylinder central may be located on the open deck. The gas cylinders shall then be stored in solid racks and be effectively protected against mechanical damage, direct sunlight, and the weather. The central shall be protected by a tight roof or steel cover. Accessories, piping, etc. in the central shall be protected by for instance a steel cover, a solid mesh/grille or similar protection which can be easily opened or removed in order to replace cylinders, etc.

b) Where the gas cylinder central is located on the open deck, there shall be a clear division separating acetylene cylinders from oxygen cylinders in the gas cylinder central.

c) Pipes on the open deck shall have a wall thickness of at least 2.5 mm.

d) More than two outlet stations are accepted.

e) Outlet stations on the open deck are accepted. Outlet stations on the open deck shall be in cabinets which can be closed.

(5) This provision shall not apply to the ordinary central plant of any ship. Ordinary central plants shall comply with the other provisions of these Regulations.

## Section 22

### *Directions for use, signs/notices and marking*

(1) Entrance doors in gas cylinder centrals or rooms where acetylene and oxygen cylinders are stored shall be fitted with warning notices in accordance with the NS 6033 which in writing and illustrations clearly express:

| | |
|---|---|
| GASS UNDER TRYKK | GAS UNDER PRESSURE |
| Beholderne skal bringes i sikkerhet under eventuell brann. | Remove cylinders to a safe place in case of fire. |

(2) The door shall also be fitted with prohibition signs in accordance with NS 6033 with a text clearly indicating:

| | |
|---|---|
| GASSFARE | GAS DANGER |
| Åpen ild og røyking forbudt. | Fire, open light and smoking prohibited. |
| ADGANG FORBUDT | NO ADMITTANCE |

(3) In the immediate vicinity of gas central accessories, regulator and cylinders, etc., a sign shall be posted with directions for use and a clearly worded text giving the necessary detailed instructions for the use of the gas cylinder central. The directions for use shall be in English and Norwegian.

(4) In the immediate vicinity of the regulators, notices shall be posted, clearly stating the maximum pressures in the pipelines permitted between the regulators and the outlet stations.

(5) Venting from safety valves and similar devices shall be marked with prohibition notice NS 6033 with the following text:

| | |
|---|---|
| GASSFARE | GAS DANGER |
| Åpen ild og røyking forbudt. | Fire, open light and smoking prohibited. |

(6) In the outlet stations, notices indicating the operating pressure shall be posted. Signs shall also be posted clearly stating that the valves shall be closed when the installation is not in use.

(7) Low-pressure pipes between regulators and outlet stations shall be painted or marked in such a way there will nowhere be any doubt as to which gases are conveyed by the pipes.

a) Acetylene pipes shall be painted/marked in: Red.

b) Oxygen pipes shall be painted/marked in: Blue.

(8) Directions for use for the central plant and portable welding equipment shall be supplied by the equipment vendor.

## Section 23

### *The carriage/transportation of gas cylinders*

(1) During the carriage of acetylene and oxygen cylinders on board ship and during the transportation of such cylinders to and from ships a means of conveyance suited for the purpose shall be used.

(2) A protecting cover shall always be screwed on the gas cylinders during carriage or transportation and also at all times when the gas cylinders are not in use.

(3) The gas cylinders shall not be exposed to bumps and jolts during transportation and other handling.

# Chapter IV
# Electrical welding

## Section 24

### *Requirements in respect of the ship's welding plant*

(1) An electrical welding plant shall at all times comply with the requirements in force on electrical equipment on board ship which are contained in the regulations laid down by the Norwegian Directorate for Civil Protection (DSB).

(2) Equipment and installation of welding plants shall comply with the technical specifications contained in CEI/IEC 60974-1 and the international standards contained in CEI/IEC 60974-7, prepared by the International Electrotechnical Commission.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

## Section 25

### *Particular measures for the use of electrical welding equipment*

The recommendations contained in the technical specifications of CEI/IEC 62081 (Arc welding equipment – Installation and use) apply as Norwegian regulations.

Amended by Regulation of 17 December 2004 No. 1857 (in force on 1 January 2005).

# Chapter V
# Concluding provisions

## Section 26

### *Entry into force*

(1) These Regulations enter into force on 1 July 2002.

(2) From the same date, the following regulations are repealed:

a) Regulations of 9 February 1976 No. 3801 concerning electrical welding on board ships;

b) Regulations of 21 March 1977 No. 2 concerning welding equipment, etc. for the welding gases acetylene and oxygen in ships and special purpose ships;

c) Regulations of 17 June 1986 No. 1294 concerning precautions to be taken in connection with welding and other use of open flames, etc. on board tankers in operation;

d) Regulations of 5 May 2000 No. 618 concerning welding equipment, etc. for the welding gases acetylene and oxygen in ships; and

e) Instructions of 17 June 1986 No. 3015 for preparations for welding or hot work in cargo tanks.

Amended by Regulation of 29 June 2007 (in force on 1 July 2007, formerly section 27).