

<b>Unipetrol RPA, s.r.o.</b>	<b>Pipeline supports</b>	N 13 869
Maintenance department		

The standard is binding for all entities (physical persons and legal entities) that participate in assemblies, repairs and modifications of pipeline systems and pipeline installations, operator of which is UNIPETROL RPA, s.r.o. The standard does not apply to subsidiaries of UNIPETROL RPA, s.r.o. Furthermore, it does not apply to the Litvínov and Kralupy Refineries either.

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	Maintenance support section	22.01.2019

## Initial provisions

This standard determines and specifies in more detail the procedures for the assembly and repairs of pipeline systems and pipeline installations under the conditions of UNIPETROL RPA, s.r.o.

The objective of this standard is to achieve the highest possible standard quality for individual pipeline installation types (brackets and suspensions) with an emphasis on the maximal utilization of welded brackets (integrally connected parts), thus eliminating corrosion of the pipeline systems at the given installation locations.

Deviances from the described installation standard (such as the use of mounted sockets) must be approved by the appropriate maintenance representative and the corresponding reasons must be stated.

Laying pipelines directly on a steel structure without proper installation is prohibited.

Production, delivery, assembly and repairs of pipeline installations at the company are secured in a contractual manner based on contracts concluded between UNIPETROL RPA, s.r.o. and a qualified service company (contractor).

### 1. Scope of validity

The procedure includes installation, assembly and repairs of the pipeline systems, resp. their installation on the devices of UNIPETROL, RPA s.r.o.

The procedure also defines the rules and parameters of the control mechanisms for being accepted for use.

The obligation of external companies to accept and comply with this standard must be stated in the corresponding contracts for work or other similar contracts concluded between UNIPETROL RPA, s.r.o. and the given contractor.

### 2. Terminology and definitions

Company	- UNIPETROL RPA, s.r.o.
User	- unit manager (for example, section director, plant director department manager or production facility or section manager), to whom the assets have been entrusted. He/she is responsible for compliance with the conditions for a safe and reliable operation pursuant to the instructions and regulations designated for its use, operation and service
Care taker	- director of the technical unit or the service unit, maintenance department manager or manager of the premises and asset management department or another authorized employee who is responsible for the technical condition of the designated individual groups of tangible assets, including installations, maintenance, repairs, revisions and tests
Client	- employee responsible for the activities associated with work orders
Contractor	- authorized physical person or legal entity, technically capable to assemble and repair flange joints, i.e. including dedicated technical devices, which holds the appropriate TCR authorization pursuant to

	Section 6, Paragraph 1, Letter b) of Act No. 174/1968 Coll., and which has a valid trade license
Anchoring	(anchor (fixed point)) solid device for preventing all relative turning and shifting of the pipeline at the usage location at the given construction temperature and loading conditions
Directional stopper	(line stop) device that prevents axial shifts of the pipeline
Guide	(guide) device that allows for the pipeline to move in the direction determined in advance, while preventing the pipeline to move in one or more other directions
Sliding support / shoe	(sliding support or shoe) device for transmitting vertical loads of the pipeline part, which limits the downward vertical movement, but which does not significantly restricts plane movements or turning
Roller support	(roller support) basic support with one or multiple pulleys, which has an extraordinarily small axial resistance
Rigid support / rigid hanger	(rigid support, rigid hanger) device for transmitting loads in one direction (vertical), which prevents movement in this direction
Spring hanger / spring support	(spring hanger, spring support) pipeline support with variable characteristics for transmitting vertical loads, which allows for vertical shifts, fixed or hanged
Constant hanger / constant support	(constant hanger, constant support) pipeline support with constant characteristics for transmitting vertical loads, which allows for vertical shifts, fixed or hanged
Sway brace	(sway brace) pre-stressed device that transmits reverse force to the pipeline
Rigid strut	(rigid strut) device that restricts pipeline movement in one direction, in many cases upon dynamic loads
Shock arrestor / shock absorber	(shock arrestor (shock absorber, snubber)) self-closing and self-braking device for restricting shifts in its direction, fast shifts of the pipeline network exposed to dynamic loads, while allowing slow movement (for example, due to temperature dilatations) in these directions
Boundaries	(boundaries) boundaries between the supports and adjoining structures must comply with the given pictures

### **3. Usage conditions**

The standard specified the requirements for support and movement control of pipeline systems that are subject to the requirements of standard ČSN EN 13480. It does not include the main structures, to which the supports are connected, or operation conditions, such as corrosion and erosion.

Individual supports are divided into:

- rigid supports
- movable supports
- inserted (secondary) steel structures

Support elements are such elements that connect the pipeline with surrounding structures. These elements must:

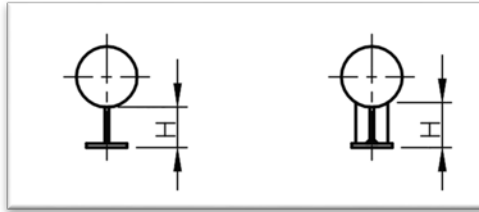
- transmit the weight of the pipeline weight and all devices connected to the pipeline
- regulate pipeline movement
- direct and transmit static loads (or dynamic loads, if they occur) from the pipeline to surrounding structures, and generally eliminate or limit one or more of the six degrees of freedom at particular pipeline locations

### **4. Design requirements**

#### **4.1. Hangers and supports with a constant load**

The following are the rules for designing this type of supports:

- Units that are constantly exposed to loads must allow for configuring loads determined in advance by at least 15%. Such setups must not shorten the specified support track.
- The support design must include measures for excessive lift beyond the calculated pipeline movement under the given construction conditions. An excess movement of at least 10% beyond the calculated one must be ensured, however, it must amount to at least 25 mm.
- The division and directions of the lift excess must be specified by the pipeline designer.
- All units must be equipped with means for movement blocking and they must be furnished with stoppers for a reliable restriction of the upward and downward movements.
- When inserted, every pipeline support must lie at least 50 mm on the profile of the loadbearing crossbar of the constructions. The length of the support panel should be increased when it is expected that the axial pipeline movements will be greater than 50 mm.
- Pipeline supports must have a vertical free play of at least 50 mm (height H) between the insulation border and the upper part of the bottom support panel



- Individual units should be delivered blocked in their assembly positions specified by the purchaser.
- When the support is blocked, it must be able to withstand double of the load determined in advance.
- Springs must be able to withstand loads during the pipeline system construction lifespan with changes caused by its ageing, which do not exceed 2.5% of the set load.

Individual units must be equipped with rigid, noncorroding type labels, which state the expected conditions of the given environment and which include at least the following:

- support reference number;
- unit type
- unit size
- total lift
- assembly load
- installation position
- standard operation position
- manufacturer name

#### 4.2. Flexible supports with variable loads

Flexible hangers and supports with variable loads are normally used for relatively small vertical movements of the pipeline. They can be used when changes of the construction load during the pipeline movement process of up to 25% are permitted. Greater changes are permitted if they are permitted by the given pipeline analysis.

The following are the requirements for fastened variable flexible supports/variable flexible hangers:

- Flexible hangers must be proposed for loads tilted under the angle of  $4^\circ$ . Fastened variable flexible supports must be able to transmit transverse loads that amount to 10% of the construction load. Should transverse movements occur, suitable sliding surfaces must be used.
- The support design must incorporate measures for excessive lift beyond the calculated pipeline movement under the given construction conditions. An excess shift of 10% must be allowed beyond the calculated movement, however, at least 5 mm
- All flexible supports must be equipped with means for movement blocking and they must be furnished with stoppers for a reliable restriction of the upward and downward movements.
- Individual units should be delivered blocked in controlled positions, specified in the corresponding technical specification.

- When the support is blocked, it must be able to withstand double of the maximal nominal load.

Spring lifespan and type label – see Point 4.1.

#### **4.3. Rigid joint supports**

The following requirements must be complied with when the use of rigid joint supports is specified:

- their characteristics must be specified by the given pipeline manufacturer
- rigid supports must be operational when pulled or exposed to pressure
- rigid supports must be fastened at their ends using a ball mounting. The mounting must only allow for a minimal movement, however, it must allow for deviances of the joint support by  $6^\circ$  from the operation plane
- rigid joint supports must allow for a length adjustment of at least 25 mm;
- construction consoles and pipeline clamps, used for the rigid supports, must change the free play and rigidity of the support system only minimally

When exposed to the construction load, the movement of the joint support from the axis between the installation centers must not exceed 1 mm for joint supports that are up to 1,000 mm long and 1 mm per 1,000 mm of length for longer joint supports.

Rigid joint supports are normally used for holding pipelines exposed to dynamic loads in one direction. Rigid joint supports should be of a high rigidity with a minimal assembly free play.

#### **4.4. Shock arrestors (shock absorbers, snubbers)**

The following requirements must be complied with when the use of shock arrestors is specified:

- usage of special design of the shock arrestors, for example, mechanical or hydraulic, must be specified by the pipeline manufacturer
- shock arrestors must not restrict or limit the temperature-based movement during normal operation
- shock arrestors must work identically when pulled or exposed to pressure
- shock arrestors must work in any position or in positions pursuant to the given specification
- shock arrestors must be fastened at their ends in ball mountings, which have a minimal free play, but which allow for turning of the unit by a maximum of  $6^\circ$  from the standard operation plane
- construction consoles and pipeline clamps, used for the shock arrestors, must change the free play and rigidity of the support system only minimally
- shock arrestors can be used as a part of the pipeline construction for controlling movements of the pipeline exposed to dynamic events, such as earthquake or fast valve closure. They have not been designed for transmitting the weight of the pipeline system.

Hydraulic shock arrestors must be equipped with a liquid level gauge and with a liquid and sealing that are suitable for the given expected environment.

If specified, they must be equipped with a position indicator.

The design of the shock arrestors must incorporate measures for an excess lift beyond the movements that corresponds to the calculation for the give construction conditions. The excess lift must be specified in the extent of 10% of the calculated movement, however, at least 25 mm. The division and directions of the excess lift must be specified by the pipeline designer.

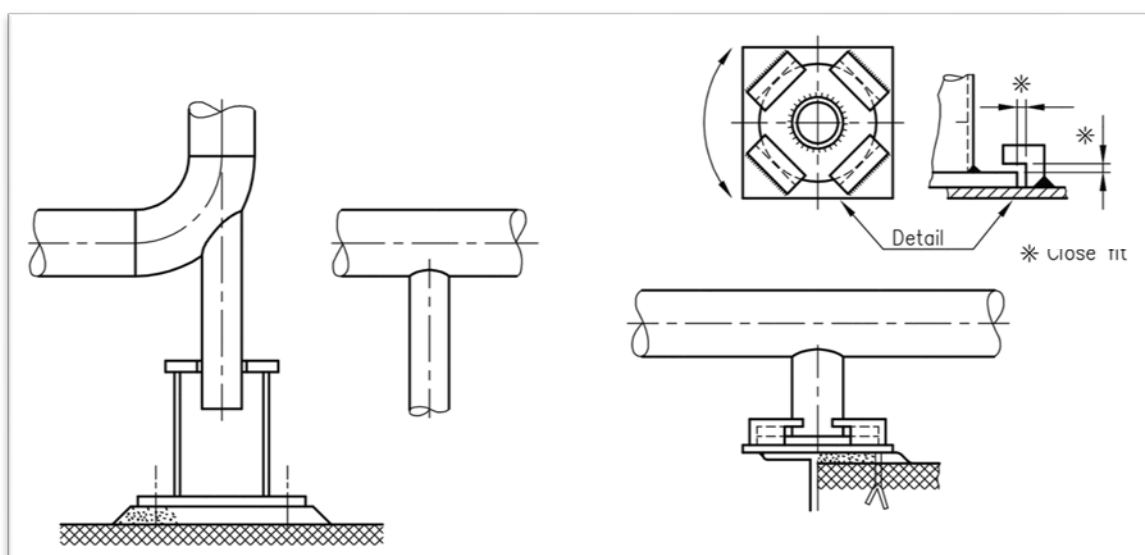
#### 4.5. Sliding supports

The following are the requirements for the sliding supports:

- Sliding supports must be designed and installed in a way that they cannot become loosened during normal operation. A possible contact loss of the sliding surfaces must also be considered.
- When devices for sliding support movement control and restriction are not used, the structure and installation of the unit must allow for turning the direction of the expected movement.
- Sliding supports must be designed in a way that they prevent pollution of the sliding surfaces during normal operation.
- Sliding surfaces must be of a sufficient size and proportions, making sure they comply with the specified movements and a safe reserve of 25 mm in all directions.

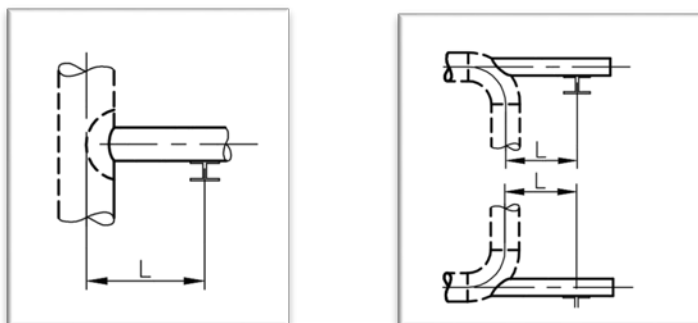
The load arising from the friction of the sliding surfaces must be incorporated in the support design proposal. When steel on steel sliding surfaces are used, the friction coefficient of 0.3 is used, unless it can be demonstrated that the selection of the sliding surfaces allows for a permanently smaller coefficient for the specified pipeline lifespan. When smaller friction forces are required, materials with smaller frictions should be used for complying with the given physical conditions and conditions of the environment during the intended operation. They include, for example, PTFE or thermoplastic.

The use of soft rubber mats must be prevented since they absorb water against the pipeline and are difficult to control.



#### 4.6. Vertical pipeline support

Fastening supports applied to vertical pipeline must be implemented using sufficiently long, welded rests, thus making sure the pipeline cannot slide under the loadbearing profile. Paint on the pipeline must be repaired after shearing protrusions are welded. Should the loadbearing load exceed the maximal load, as stated in the corresponding support selection table, you can consider using two loadbearing supports against each other. Special supports need to be proposed for greater loads.



#### 4.7. Anchoring

Anchoring must be implemented in a way that ensures that there is a fixed point for the pipeline connected to the given structure.

When suitable, the anchoring should transmit all expected forces and torques, including torques from the sliding supports and loads from the pressure, to which the bottoms are exposed.

#### 4.8. Support documentation

The support manufacturer must provide the purchaser with a certificate that confirms that the supports comply with the given requirements

#### 4.9. Construction temperatures for support parts

The temperatures considered for the support design must relate to the pipeline temperatures. All parts of the supports must be designed for temperatures within the range of 0 °C and 80 °C. For system operation temperatures outside of this range, the pipeline operation temperature must be specified and justified by the pipeline designer under the following conditions:

- Parts that can be negatively influenced by high or low temperatures, such as springs or sliding material, must stay out of any insulation.
- Support construction temperatures must be determined by a detailed calculation or test.
- All other parts, including independent interjacent steel structures, must have a construction temperature below 80 °C.
- For liquids, temperatures of which exceed 600 °C or are below –20°C, the supports must be made of a material suitable for the construction temperature and they must be compatible with the given pipe material or they must contain a suitable thermal barrier.

#### 4.10. Detailed proposal



The following are the applicable proposal rules:

- Parts that come into contact with the pipe should be designed in a way that prevents load concentration on the pipe walls, which could lead to local plastic pipe deformations.
- Detailed proposals should ensure that the given pipe is firmly placed on its support and that it is, when necessary, suitably treated for the purpose of a compensation of the tolerances of the pipe and support dimensions.
- All pull bars and suspension elements must be equipped with setup equipment. The hangers used for pipes larger than DN 100 must be designed in a way that allows for adjustments despite of the fact that they carry the specified loads.
- All nuts and pins or fastening equipment must be equipped with securing means.
- Individual parts must be designed in a way that prevents water or dirt accumulation.
- The parts must be designed in a way that minimizes bend loads on the threaded parts.
- Bolt threads must not be exposed to shearing loads, unless it is specifically included in the given bolt construction calculations.

#### **4.11. Stability**

When it is considered necessary, the design of the supports and any auxiliary and interjacent steel structures must evince resistance against stability loss.

## **5. Pipeline assembly**

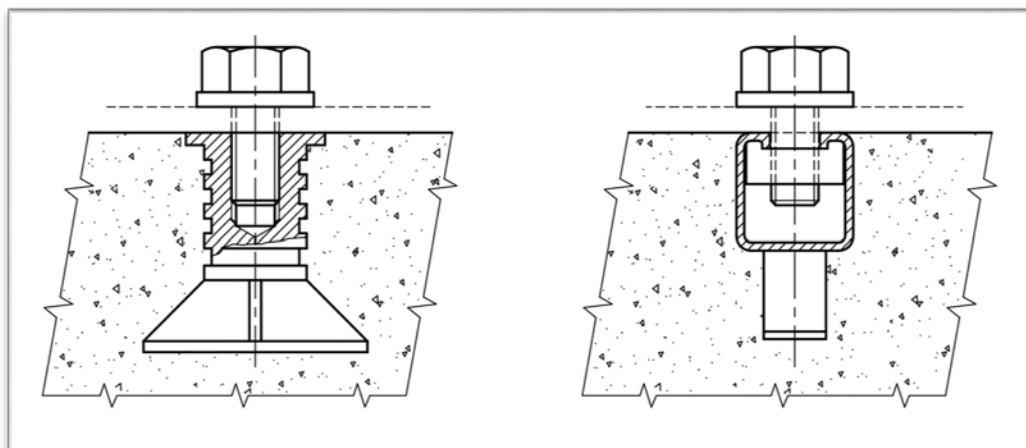
### **5.1. Fastening supports on concrete structures**

Various methods for fastening the supports on concrete structures are available. Generally speaking, cast fastening is preferred. That is why it is desirable to assess the fastening locations and loads in a timely manner. The following are some examples of the permitted methods:

- Anchoring panels are metal (welded) units intended for being embedded in concrete as a part of the construction process. They generally consist of a steel panel and connected anchoring elements (usually four of them), which are anchored in the concrete. Anchoring panels represent a preferred fastening method when the given locations and loads can be defined during the early project stages. When the anchoring panels are exposed to high shearing loads, they should be equipped with stoppers.
- Anchoring bars consist of metal inserts (direct bars or connected bars) placed in the openings left by the construction contractor or in drilled cavities, into which plastic material is subsequently poured. This method should be approved by the given construction contractor.
- Distance bolts and anchors inserted in the concrete are generally used for fastening supports, positions of which were unknown during the building structure development stage. Distance bolts and anchors should be planned in compliance with the given manufacturer specification. When their type cannot be subjected to

significant shearing loads, a pre-stress should be considered for ensuring the balance between the sliding friction force and shearing force.

- U-profiles are fastened to the concrete surface using inserted anchors. Anchored U-profiles are fastened to the formwork before the concrete is poured in it. Supports are connected to the unanchored or anchored U-profiles using special bolts and nuts. Various types of the U-profiles have bolts and nuts adjusted pursuant to their size. They are only suitable for specific U-profile types.



## 5.2. Fastening in metal structures

### Standardized bolts

- Bolt threads should not be exposed to shearing forces, unless it is taken into account during the given construction process.
- Nuts should be secured against becoming loose.
- Joints with friction bolts
- Friction joint bolts should be sufficiently tightened in order to initiate retention force between the loadbearing surfaces that are necessary for preventing sheering.

### Welding

- All welded fastening should be approved by the construction designer and by the purchaser. No welding on strips of the building structure exposed to pulling forces should be allowed without the approval of the construction engineer

## 5.1. Fastening and matching

Pipelines should be assembled in compliance with the construction requirements stated in ČSN EN 13480-3:2012. Instructions must be prepared for special operations, such as matching and cold pre-stressing. The pipeline gradient must be monitored in order to make sure that a continuous gradient in compliance with the given project is implemented.

When necessary, the assembly company must use temporary supports for assembling individual pipeline parts in order to ensure that no undesirable tensions or deformations occur in the pipeline and attached accessories arising from the console effect of unsupported weight distribution.

Pipeline supports should be installed on the pipeline system in the following manner:

- Preferably on the pipeline itself, and not on valves, flanges and fittings
- Supports of the basic type can be fastened to the elbows and arches, however, only on the side of the outer arch, not on the side that is exposed to very high loads.
- To the pipelines that do not require a frequent disassembly or disconnection from fittings, maintenance, regeneration, cleaning or removal of pipe insulation.
- As close to heavy components (such as relieve and regulation valves) as possible
- At locations where vertical movements are minimal
- At locations near flange parts (such as valves), disconnection of which will strain or deform the connected pipeline system
- Support locations and selection must also minimize vibrations in compliance with the requirements for overall lengths and span distances near the vibration sources, such as valves and fittings
- Supports must be installed as close to the directional changes as possible, however, they must allow for a sufficient flexibility of the given pipeline system.
- Supports must be installed in a way that the given identification, load and flow direction markings were clearly readable. All threaded parts must be correctly embedded and safety nuts properly tightened.

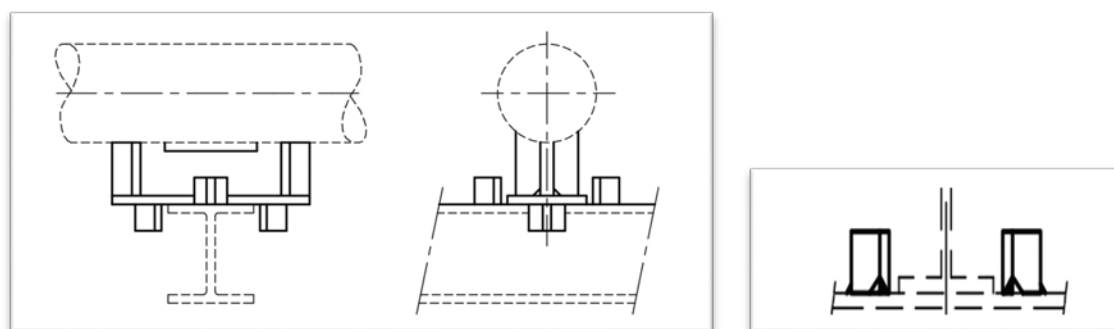
Assembly company must ensure that all fastening parts match closely to the pipeline.

Adjustable spring hangers and hangers with constant loads must be blocked during the pipeline installation and assembly process, unless specified otherwise in the given construction instructions. When the supports are not blocked due to special control operations, such as load balancing and cold pre-stressing, they must be blocked prior to the hydraulic pressure test and prior to chemical cleaning.

The assembly company must make sure that the load set on the spring supports corresponds to the given project requirements.

When a load setup is required, the assembly company must make sure that such a setup does not obstruct or limit the expected movement of the given support.

Sliding supports and guides at their cold positions must be set in a way that the given sliding mat is placed on the support parts, making sure it allows for all movements prescribed by the project. Prior to the final assembly, the pipeline system must be inspected and any potential restriction of the planned movements must be corrected.



Should cold pre-stressing be prescribed, it must be implemented against the fixed anchoring and it must be maintained for ensuring correct gaps and a correct direction during welding and subsequent thermal processing of the completed joints. When cold pre-stressing is completed, the assembly company must make sure that the pipeline is in the prescribed position.

When the setup of adjustable and spring hangers and hangers with a constant cold load requires configuration (for example, by the means of using stressing nuts and bars), the assembly company must subsequently make sure that the adjoining supports are freely movable in compliance with the given project.

Upon the final assembly and the required hydraulic pressure test, the assembly company must make sure that all temporary supports and restriction equipment are removed.

Every pipeline must be installed in a way that eliminates the possibility of any collision with another pipeline and structures during subsequent operations.

## **6. Integrally connected parts**

Integrally connected parts are forged metal parts or parts welded to direct pipeline walls exposed to pressure, which transmit pipeline loads into a steel structure or concrete.

Material of the integrally connected parts should be chosen in a way that it is identical or very similar to the given pipe material, thermal expansion coefficient and flexibility module. Moreover, the permitted loads of the connected part should be similar to the permitted load of the pipe material. Should there be large differences, a special attention should be paid to the selection of a suitable permitted load.

For pipelines that operate in the area of creeping, it is recommended to use the same material for the integrally connected parts as the material used for pipes. The welds must be full penetration welds.

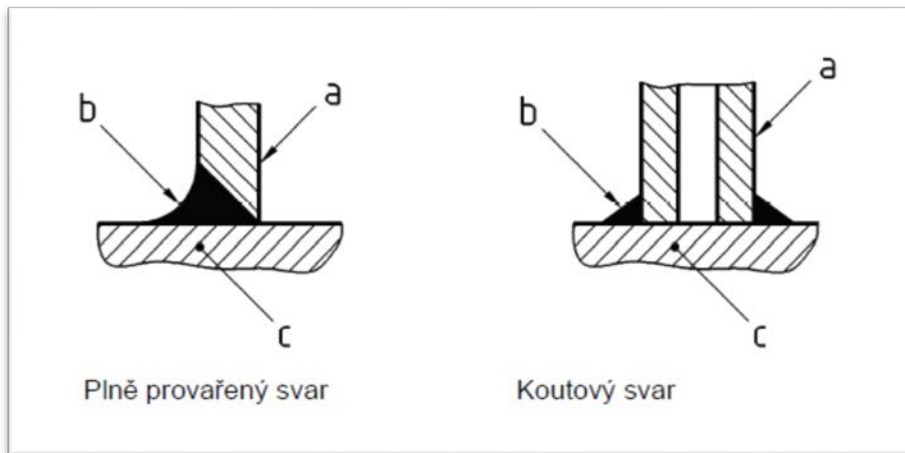
Connected parts with small lever arms can be proposed for shearing only when the shearing tension is similar to the bending stress. When they are welded to thin-wall pipes, the bending stress in the pipe wall must be determined and assessed.

Tensions in the pipe wall must be combined with the tensions arising from:

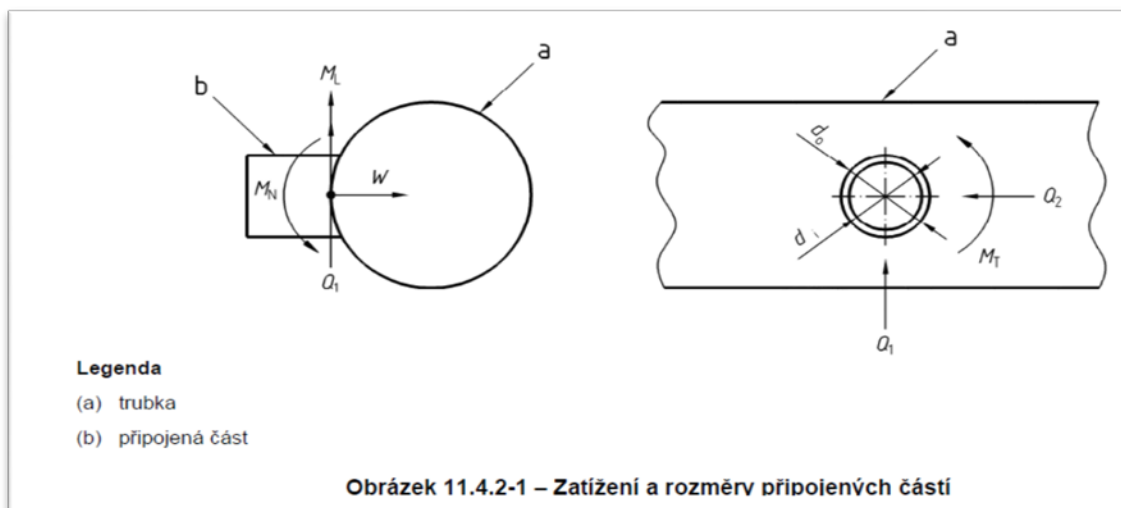
- internal pressure
- external loads

### **6.1. Hollow circular connected parts**

Connected parts must be welded to the pipe by full penetration welds or fillet welds along the entire outer perimeter



Explanatory notes: a) connected part b) weld c) pipe wall  
The axis of the connected part must be perpendicular to the pipe.

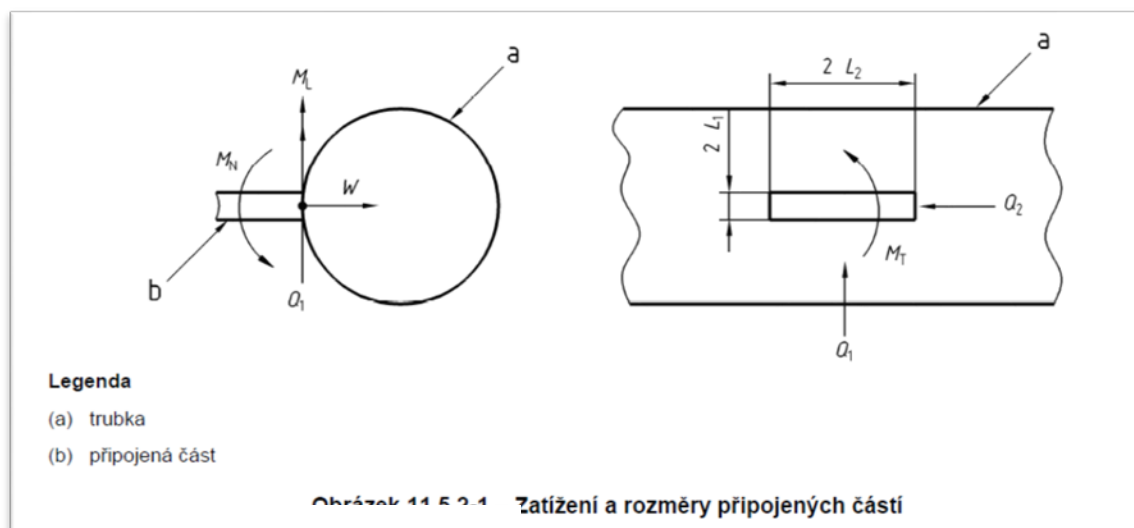


NOTE: Fillet welds and partial penetration welds are not permitted for the pipes that operate in the creeping area.

## 6.2. Right-angled connected parts

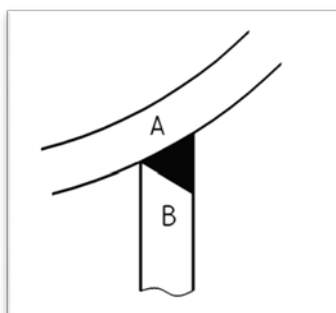
Connected parts must be welded to the pipe:

- by full penetration welds along the two long sides of the connected parts; or
- by fillet welds or partial penetration welds along four sides of the connected parts; or
- by fillet welds or partial penetration welds along two sides of the connected parts when the length of the long side is at least three times longer than the shorter side and when there is no fatigue.

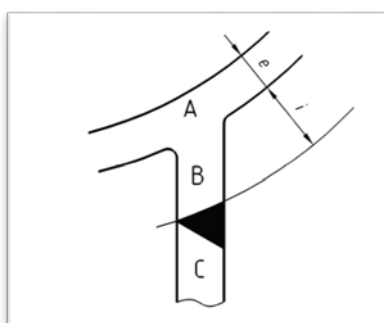


### 6.3. Fastening supports by welding

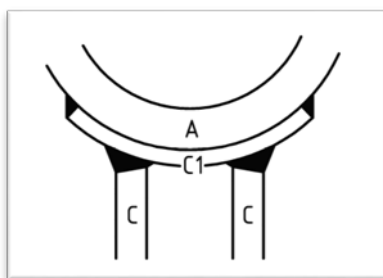
When the supports are welded directly to the pipeline, the actual welding must correspond to ČSN EN 13480-4. The tension formed due to different expansions between pipe A and welded accessory B must be considered when designing the supports and pipelines.



When an attachment is forged or cast integrally with the given pipe, all extension welds must correspond to ČSN EN 13480-4, provided it cannot be demonstrated that neither the weld in question, nor the affected zone have any impact on the mechanical characteristics of the shell that is exposed to a load.



When support C is connected to pipe A via an interjacent element or sheet metal base C1, the material of this sheet metal base must be compatible with the pipe and the welding to the pipe must correspond to the pipe welding requirements.



#### 6.4. Material requirements

Materials used for the production of supports must be acceptable for the given operation conditions and conditions of the pipeline environment. Materials of the supports that come into contact with the pipeline must be compatible and must not have any impact on the required metallurgical characteristics of the pipeline material. The materials must comply with the requirements of ČSN EN 13480-2.

Sheet metal bases or supports must be welded at least 50 mm from the welds on the given pipeline branch. Supports and sheet metal bases must not be welded over the welds on the given pipeline branch.

Carbon steel lugs must not be directly welded to stainless steel pipes. This stipulation applies to all stainless steel pipelines.

For pipelines made of austenitic stainless steels, the supports must not be directly welded to the thin-wall pipe. Instead, they should be always welded to the given sheet metal base.

#### 6.5. Welded support limitations

Supports cannot be welded directly on pipelines in the following cases:

- materials that require thermal processing after welding
- polished carbon steel
- zinc-plated materials
- nonferrous materials

Zinc-plated supports and other added elements must not be used on austenitic stainless steels, duplex stainless steels and nickel steels.

For pipelines that require thermal processing after welding, the corresponding pipeline drawing must state the added elements that are necessary for the loadbearing purposes (sheet metal bases), and the welding is conducted in a workshop prior to the thermal processing after welding.

All welds of the supports and added elements must be continuous.

Welding of the supports and added elements must be completed prior to rinsing, chemical cleaning or blowing.

Pipeline supports of a welded type must not be used for the following pipelines:

- pipeline coated with glass, rubber, plastic, etc.
- expensive materials, such as titanium, Hastelloy, Monel, etc.

- pipelines coated with anticorrosion products (such as galvanized pipelines)

Pipeline supports with a fastening system should be used for the above mentioned pipeline systems.

## 6.6. Design requirements for integral connections

Pipeline supports can be defined in the following manner:

- standardized supports
- adjusted (specially proposed) supports

General requirements:

- The shapes, dimensions and loadbearing capacities of the standardized supports are determined, demonstrated and cataloged.
- Supports must be designed in a way that complies with the given pipeline proposal requirements. Support designs must be confirmed by a calculation or a type test (load capacity). When type-tested parts are used, the given operation temperature must be considered. The use of standardized support types, design of which has been verified in the past by a calculation or testing for the given operation conditions, is acceptable. The pipeline design engineer must provide correct information on the loads and movements at the locations of the proposed supports for the purpose of the given supports proposal.
- The pipeline flexibility analysis must include the weight of the pipeline itself, together with the usual medium and insulation, and it must consider all other factors described in the flexibility analysis. The pipeline design engineer must consider the impact of the pipeline movement, deviation of suspension bars and friction on the load.
- When selecting individual supports, you also need to consider all expected external climatic loads, such as wind, snow or ice.
- When the pipeline is exposed to external impacts (vibrations, structure shifts, bedrock movement, earthquake, etc.), the purchaser must specify these impacts in his order and he must also define the corresponding characteristics for their incorporation in the given support proposal.
- All loads caused by hydrostatic tests must be considered when preparing the proposal for the supports and connected structures.
- Design of the supports must not create greater tensions and deformations than the permitted tensions and deformations at any spot throughout the pipeline network.
- Design of the supports must not change the expected movement and loads without the approval of the given pipeline network design engineer.
- All maintenance requirements and lifespan restrictions must be specified by the manufacturer.
- When the supports are exposed to cyclic loads or movements (such as shock arrestors or joint braces), all supports must comply with the specified lifespan of the structure and the number of loading cycles.
- All supports must be furnished with appropriate markings of the given location, type and identification on the isometric pipeline drawing, plan or in some other way.



- Should thermal processing after welding be required, the pipe supports must be welded directly on the parts that are exposed to pressure prior to thermal processing after welding.
- All thermal processing after welding must be conducted in compliance with the given written procedure.

#### Temporarily fastened parts

- When temporarily fastened parts (bars, suspension eyes, etc.) are welded to the pipeline, they must be connected using an approved welding procedure with the additional material being compatible with the given pipe material. Such temporarily fastened parts must be removed by cutting or grinding and any temporary welding metal must be also removed by cutting or grinding, making sure the final surface is smooth. This cutting or grinding must not reduce the thickness of the walls of the given pipeline part below the minimal calculation value. Temporarily fastened parts and temporary welding metal must not be removed by breaking.
- Approvals of the welders for temporary welds must be identical to the permanent weld welders.

#### Permanently fastened parts

- Pipe supports and other permanently attached parts that are connected directly to the pipes must be made of the same material as the pipe, to which they are connected, or of compatible materials.
- Connection welds of the pipe supports must be uninterrupted, unless specified otherwise in the given construction documentation.

## **7. Installation inspections and acceptance proceedings**

The inspections are conducted by the given device administrators during the implementation period and after the work completion. Acceptance proceedings of the insulation works will be conducted based on the completed and signed protocols.

## 8. List of related and other legal regulations

ČSN EN 13480-2	Industrial metal pipelines - Part 2: Materials
ČSN EN 13480-3	Industrial metal pipelines - Part 3: Design and calculation
ČSN EN 13480-4	Industrial metal pipelines - Part 4: Production and assembly
DEP 31.38.01.29-Gen.	PIPE SUPPORTS
N 11 986	Pipeline distribution networks
N 13 860	Free pipeline hanger
N 13 861	Rigid pipeline hanger