

CHEMOPETROL, a.s.  TECHNICAL SERVICES	Operation thermometers Use and assembly	N 13 023

The standard is binding for all company units and external companies when using and assembling operation thermometers. It does not apply to the Litvínov and Kralupy refinery unit.

The units are obliged to acquaint all external companies that conduct these activities for them with the standard. The standard shall be also binding for these external companies.

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## 1. Initial provisions

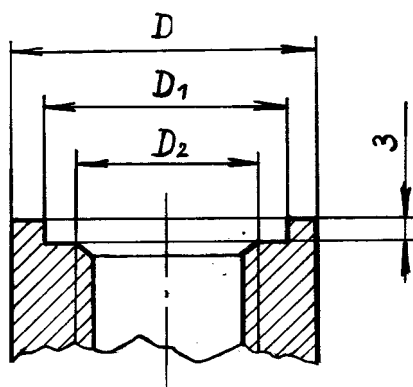
- 1.1 This standard applies to the use of thermometer wells in PN 160 and their assembly. For the use of thermometer wells for an operation overpressure of 32.5 MPa, the N 16.31 and N 16.32 standards apply.
- 1.2 This standard also determines principles for the use of selected thermometer types.
- 1.3 This standard addresses mutual relations between the units that conduct maintenance and the corresponding technical unit of Chemopetrol, a.s. It specifies the obligations and effectiveness limits for the assembly of thermometer wells and selected thermometer types.
- 1.4 This standard does not apply to temperature-measuring devices delivered pursuant to foreign standards. Such device can be used until the end of their lifespan. When being replaced by domestic devices, this standard must be observed.
- 1.5 Construction and projection units are obliged to respect this standard.

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- 1.6 Company units are obliged to apply this standard from the safety perspective for projects, during which temperatures will be measured pursuant to domestic standards already when concluding HS.
- 1.7 Since the field standards pursuant to Act No. 142/91 Coll. became invalid as December 31<sup>st</sup>, 1993 (cancelled without any substitution), all ON stated in this standard should be considered only informative. Since the thermal wells and welds made pursuant to these ON, built-in in the existing company production and technological devices, the standard is prepared also considering this fact. ON can be used in the given cases upon agreement and based on contractual relations, provided there are no applicable ČSN or other technical standards.

## 2. Welds and couplings for thermometer wells

- 2.1 Welds and couplings for the thermometer wells for the company production devices have been selected (can be selected) in accordance with ON 02 7320, or ON 02 7321.
- 2.2 When welds with a M 27 x 2 or M 33 x 2 joint thread with a flat front surface for flammable, explosive and poisonous substances are used, they should be modified for embedded sealing in the following manner:



Weld pursuant to	Dimension			Thermal well pursuant to
	D	D <sub>2</sub>	D <sub>1</sub>	
ON 02 7320	45	M 27 x 2	36	ON 02 7210
			43	ON 02 7211
ON 02 7321	55	M 33 x 2	41	ON 02 7215
			46	ON 02 7216

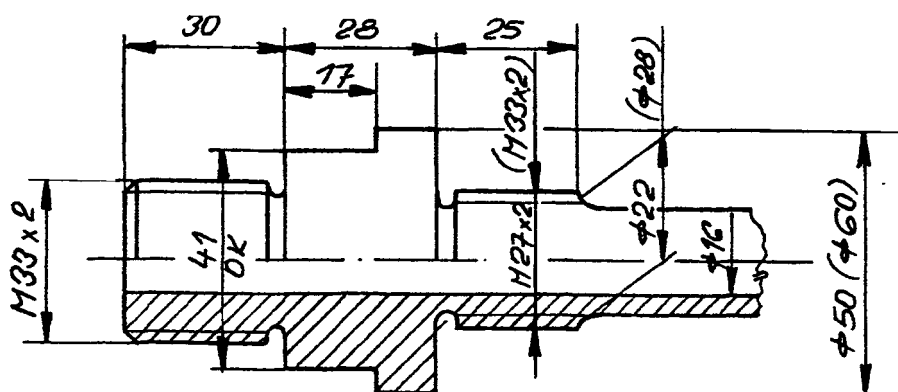
The welds modified in this manner are used for new devices. A thermometer well for embedded sealing is implemented for existing devices - see Paragraph 3.

- 2.3 Other weld types and couplings than those stated in ON 02 7320 and ON 02 7321, which the CHP OKMP, s. r. o. unit used to use earlier for older devices, can be used until the end of their lifespan.
- 2.4 The material of the welds and couplings is selected based on work conditions at the given usage location. They are usually made of the same material as the basic part, to which it is supposed to be welded.

### 3. Thermometer well

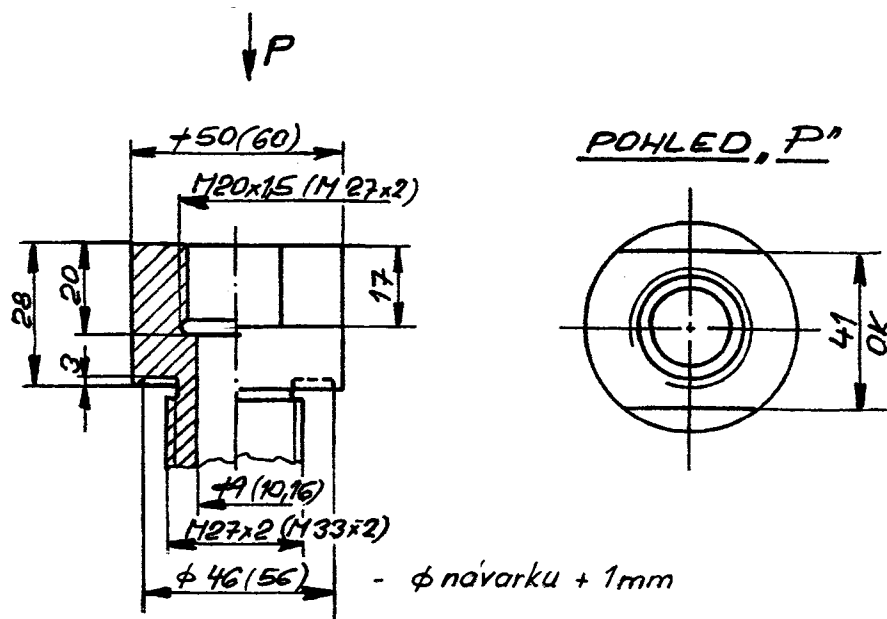
- 3.1 Thermometer wells for the company production devices have been selected (can be selected) in accordance with ON 02 7201, ON 02 7210, ON 02 7211, ON 02 7212, ON 02 7213, ON 02 7215, ON 02 7216, or ON 02 7221, ON 02 7222, ON 02 7223, ON 02 7230.
- 3.2 A new well type with an outer M 33 x 2 threaded joint is being introduced at the company.

The values stated in the parentheses apply to thermometer wells implemented in accordance with ON 02 7216



Length, other dimensions and implementation pursuant to ON 02 7211, resp. ON 02 7216. If needed, these wells can be also used for embedded sealing, modified pursuant to Article 3.3.

- 3.3 Thermometer wells for flammable, explosive and poisonous substances should be modified if they are used with old devices, where the welds are not modified.



Other dimensions and implementation pursuant to ON.

- 3.4 Other thermometer well types than those stated in the corresponding standards, which the CHP OKMP, s. r. o. unit used to use earlier for older devices, can be used until the end of their lifespan.
- 3.5 Material of the thermometer wells is determined pursuant to the appropriate ON, with the stipulation that instead of quality 15 123, which is not produced anymore, quality 15 128 is used, and to mat. 17 246 is alternatively replaced by mat. 17 248.  
For heavily corrosive work substances, for which material 17 246, 17 248 or 17 347 is not satisfactory under the given operation conditions, the well material should be determined on the case by case basis.

#### 4. Sealing of pressurized areas

- 4.1 Flat sealing is used for sealing pressurized areas between the thermometer well and the weld or coupling.
- 4.2 Aluminum sealing that is 2 mm thick is generally used. Its inner and outer dimensions are determined based on the fact if the sealing is open or embedded. The opening should be equal to the thread diameter + 0.5 mm, outer diameter  $D$  resp.  $D_1$  pursuant to Article 2.2 – 0.5 mm. Nevertheless, aluminum cannot be used for sealing lye solutions and other alkaline substances. In these cases, galvanized copper is used. However, that cannot be used for ammonia and substances that contain ammonia.
- 4.3 Metal-plastic sealing supplied with the thermometers with a well by ZPA can be used for water and water steam within the range of all operation temperatures.

## 5. Assembly of thermometers and wells

- 5.1 The well type is determined either by the given project or by the corresponding Chemopetrol, a.s. unit and the given unit (company) that conducts maintenance.
- 5.2 The sealing manner and surface modifications, if any, are determined by mechanical maintenance personnel.
- 5.3 Mounting of thermometer wells on production devices is conducted by the maintenance unit.
- 5.4 Installation of thermometers into wells and their actual connections are implemented by the unit (company) that conducts MaR maintenance
- 5.5 Suitability of the use of thermometer wells for pressure thermometers is specified in Article 1 of ČSN 02 7201 and Article. 4.2.6 of ČSN 25 8201.
- 5.6 Resistance temperature sensors are installed pursuant to the instructions of the manufacturer - see ČSN 25 8301.
- 5.7 Temperature resistance sensors supplied by the manufacturer with wells are installed directly into the welds for operation pressure and operation temperature marked on the given thermometer. Temperature wells must withstand the effects of the given operation medium. The well material must be marked on the well. These thermometers are submitted for assembly by the unit (company) that conducts MaR maintenance. The lifespan of these thermometers is monitored by the given technical unit of Chemopetrol, a. s.
- 5.8 Should the resistance sensors, supplied by the manufacturer together with the well, need to be used for higher parameters than those stated by the manufacturer, the installation into the well must be executed pursuant to ON 02 7211. Such exceptional cases, when the time constant worsens, are decided by the the appropriate unit of Chemopetrol, a.s.
- 5.9 Should it be necessary to use resistance sensors supplied by the manufacturers with wells for operation substances that are flammable, explosive and poisonous, the installation in old devices, for which the sealing surface of the welds for embedding the sealing is not modified, must be implemented in the wells that have been modified for embedded sealing. Due to worsening of the time constant, such cases are addressed by the corresponding Chemopetrol, a.s. technical unit and maintenance-conducting units.

## 6. Related standards

ON 02 7201  
(1964)

Thermometer wells – basic stipulations and related standards stated in the amendment to the given standard

ČSN 25 8301	Thermoelectric and resistance sensors for monitoring liquid temperatures
ČSN 25 8201	Pressure thermometers
ČSN 02 7201	Thermometer wells. Technical requirements
ČSN 02 7202	Devices for measuring and control of technological processes - Thermometer wells with an inner thread. Basic dimensions
N 16.31	Thermometer wells with an inner thread
N 16.32	Thermometer wells with an outer thread
ZPA catalogue	
ON 02 7201	Thermometer wells. Technical regulations
ON 02 7210	Steel, screw-in thermometer well for resistance, thermoelectric, bimetallic and glass thermometers
ON 02 7211	Steel, screw-in thermometer well for pneumatic thermometers and pneumatic temperature transmitters
ON 02 7212	Steel, welded thermometer well for resistance, thermoelectric, bimetallic and glass thermometers
ON 02 7213	Steel, welded thermometer well for pneumatic thermometers and pneumatic temperature transmitters
ON 02 7215	Thermometer well for high flow speeds for resistance, thermoelectric and glass thermometers
ON 02 7216	Thermometer well for high flow speeds for pressure thermometers
ON 02 7221	Steel thermometer well with a replaceable protective pipe
ON 02 7222	Aluminum thermometer well with a replaceable protective pipe
ON 02 7223	Semi-lead thermometer well with a replaceable protective pipe
ON 02 7230	Lead thermometer well with a flange and a replaceable pipe
ON 02 7320	Welds and couplings. Main dimensions
ON 02 7321	Couplings for thermometer wells for high flow speeds

**Note:**

- 1) This standard transcribes standard N 13 023 from 08/1982 to the A4 format.
- 2) This standard includes references to other standards (for example, ON 02 7201, ON 02 7210, ON 02 7211, etc.), which are now already invalid, however, they had to be considered in this standard because of the character of the company production devices.