

46	47	48	49	50	
	Ag	Cd	In		
Palladium	Silver	Cadmium	Indium	Tin	
78	79	80	81	82	
Pt	Au	Hg	TI	Pb	
Platinum	Gold	Mercury	Thallium	Lead	
110	111	112	113	114	
	Rg	Cn	Nh		
	Roentgenium	Copernicium	Nihonium		

DECLARATION OF CONFORMITY REFERENCE

NUMBER AS16072017-BO

Container Type BOMETANK® HG1000 for 1000 kg of Metallic Mercury

1.

- 1.1 Project manager BOME s.r.o., Company Reg. No. 47217201, V jezírku 544, 252 43 Průhonice, info@bome.cz acting by the executive Ing. Michal Provazník, CSc.
- 1.2 Designer Ing. Jan Sedlák SETOS, Company Reg. No. 12592439, Dejvická 555, Prague 6, sedlak-setos@volny.cz
- 1.3 Manufacturer Agapaservis s.r.o. Company Reg. No. 28224469, Vraňany 232, info@agapaservis.czacting by the executive Mr. Pavel Jelínek

hereby jointly declare that the BOMETANK® HG1000 product has the properties stated below.

2.

It is in accordance with Decree 93/2013 and its Appendix 13 (which, except for the numbering, is identical to the wording of the European Directive 2011/0132) as regards specific criteria for the storage of metallic mercury considered as waste, while dealing with the individual provisions as follows:

- 2.1 A.1 The composition of metallic mercury as a permitted filling and the prohibition of additives causing corrosion is specified in the User Manual (Appendix 5)
- 2.2 A.2 Requirements for means of collection
- 2.2.1 The corrosion resistance of the containers is solved by a protective coating, see Appendix 3 Technical sheet
- 2.2.2 The presence and composition of welds is dealt with in Appendix 2
- 2.2.3 A.2a) Material design: carbon steel 11 523 (higher than ASTM A36)
- 2.2.4 A.2b), c) Impermeability and resistance are determined by the construction and verified by testing and final inspection, see Appendixes 1 and 4
- 2.2.5 A.2d) The product has successfully passed drop tests pursuant to 6.1.5.3 and the leakproofness test pursuant to 6.1.5.4 of the ADR regulation. See Appendix 1
- 2.2.6 A.2 The internal volumetric volume of the container is 100 L. The permitted maximum mercury filling of 1,050 kg (nominal is 1,000 kg) occupies a volume of 78 L, i.e., 78%, and meets the requirement for filling with a permitted filling of no more than 80%
- 2.3 A.3 The buyer of containers and anyone else who has a legitimate interest in this will receive this document, including all Appendixes, in electronic form from any of the signed entities mentioned in paragraph 1. Let this be the basis for issuing a certificate pursuant to A.3 of Appendix 13 of Decree 93/2013
- 2.3.1 Labeling of containers is pursuant to A.3 c) and d). See Appendix 4
- 2.4 B.9 The requirement for easy removal of the container from storage is met by the fact that the container has easily accessible eyelets in its highest part, which can be used to lift it even if it can only be accessed from above.
- 2.5 C.2 Record keeping. The type and method of registration is given in Appendix 4. This document with its Appendixes is kept on the website www.bome.cz



3.

It is in compliance with the provisions of ADR, which relate to the transport of coke mercury in drum-type packaging. They are the following:

- 3.1 Section 1.3-Training of persons and 1.4 Safety obligations of the participants. Information that must be provided to third parties to fulfill the obligations stated there is contained in the instruction manual, see Appendix 5
- 3.2 ADR 5.2.1.8.3 "fish and tree" label, ADR 5.2.1.9.1 orientation label (arrows pointing up), ADR 6.5.2.2.2 maximum permitted stacking load label conforms, the container is marked with these signs, for stacking conditions see the instruction manual, Appendix 5
- ADR 6.1.4.1 requirements for steel drums 6.1.4.1.1 conforms material thickness is adequate see the successful drop tests. 6.1.4.1.2 conforms joints are welded. 6.1.4.1.5 conforms openings for filling are less than 7 cm, M56, threaded part is welded. 6.1.4.1.8 conforms, volume is less than 450 L. 6.1.4.1.9 conforms net is 145 kg. The other points of Section 6.1.4 do not apply to the product.
- 3.4 6.1.5.1.10 conforms, see Appendix 1
- 3.5 ADR6.1.5.1.8conforms-testreportsseeAppendix1,photoandvideodocumentationarchivedatBomes.r.o.ADR6.1.5.2.1 conforms tests were performed with the packaging as it will be prepared for transport, but with regard to the special provisions of Decree 93/2013 Coll., Appendix 13 Section A(2) for metallic mercury, which stipulates no more than 80% of the volumetric volume of the package, i.e., with a filling corresponding to the prescribed maximum for the package.
- 3.6 ADR 6.1.5.3.1a conforms. The product has successfully passed the drop tests. ADR 6.1.5.3.4 target conforms. Used steel plate 10+5 mm thick on a concrete panel ADR 6.1.5.3.5 drop height conforms. Mercury falls under packaging group III, where a fall height of 0.8 m is stated, which was observed during the tests. See Appendix 1
- ADR6.1.5.4leakproofnesstest.-conforms,6.1.5.5internalpressure(hydraulic)test-conforms. Bothtestswerecombined. Due to the declared possibility of emptying with air pressure, this test was performed at a pressure of 2 bar for 6 hours, i.e., under significantly stricter conditions than required by the ADR regulation. The pressure was calculated using a more stringent method than ADR 6.1.5.5.4 (a) for the maximum possible difference between the filling temperature at 10°C and the closed container in full sun at 80°C, with the contribution of saturated mercury vapor tension and water vapor and with a safety factor of 1.5. See Appendix 1
- ADR 4.1.3.6 conforms, because ADR 6.1.5.5.4(a) sets the test pressure according to the above calculation (see Appendix 1) at 0.9 bar ADR 4.1.3.6.3 allows a deviation from the test pressure of 6 bar in case that is determined otherwise. This also complies with the packaging instruction P800 (1) and the product is considered a transport pressure vessel, the character of which is single-purpose for metallic mercury filled and closed at atmospheric pressure.
- 3.9 ADR 6.1.5.6 stacking test performed, but stacking is not permitted during transport. When storing at the destination, stacking is allowed up to 3 layers under the conditions specified in the user manual. See Appendix 5.



4.

Conclusion:

The BOMETANK® HG1000 product meets the legislative and technical requirements and has real utilizable properties for:

- 4.1 Transport of up to 1050 kg of metallic mercury by road, rail, and inland waterways pursuant to ADR
- 4.2 Temporary storage of up to 1050 kg of metallic mercury in storage facilities pursuant to Decree 93/2013, which is identical to the wording of European Directive 2011/0132
- 4.3 The product has these declared capabilities provided that it is used in accordance with the user manual attached to this document.

List of appendixes:

Appendix 1 Protocol and documentation of technical tests performed

Appendix 2 Provisions on welds on the product

Appendix 3 Technical sheet of the product

Appendix 4 Labelling, production records, and output control of products

Appendix 5 User manual

Appendix 6 Catalogue of spare parts

Ing. Jan Sedlák Ing. Michal Provazník Pavel Jelínek

Vraňany 18. 7. 2017

Appendix 1 Declaration of Conformity, Reference Number As16072017-BO Tests

P1.1 Drop tests pursuant to ADR 6.1.5.3

Pursuant to ADR 6.1.5.1.10, drop tests were performed on one sample. Since no certification authority is specified by the regulation to perform drop tests of packaging for metallic mercury, the joint decision of the designer, manufacturer, and contractor BOME s.r.o. (a company fully certified for all methods of mercury management) can rightly be considered fully professionally competent.

ADR 6.1.5.3.4 target. A 1.5x1.5x1.5 m steel tank with a wall thickness of 5 mm was made for this test. The bottom of the tank was lined with a 10 mmm thick steel sheet and the entire tank was placed on a concrete panel with a thickness of 15 cm. **The container was filled with 1000 kg of mercury**.

The tested full container was suspended on a release apparatus specially designed for this purpose. This apparatus pulls out the suspension pin by means of a rope and a gear lever, and the container is suddenly released and without imparting rotation or horizontal acceleration. The entire assembly was suspended on a crane boom attached to the forks of a forklift truck. The result is a completely exact vertical fall.

The drop height was determined by slowly lifting the assembly with a forklift truck until it was lifted above the steel plate. Then the reference height of the boom to the edge of the catch tank was measured and subsequently raised 810 mm by the forklift truck. After the entire assembly stopped moving, the release apparatus was activated. The whole process was photographed and filmed from several angles. **Photo and video documentation is archived**.

Because the display on the scales was flashing, it was not possible to take photo documentation, only video. A video recording of the display of the scales during weighing is part of the archived documentation.



• Test area used for the tests







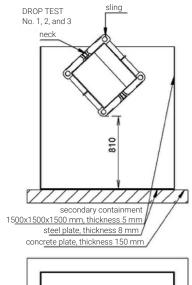


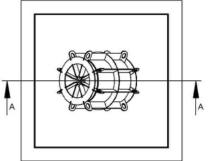
Weighing

P1.1.1 Pursuant to ADR 6.1.5.3.1

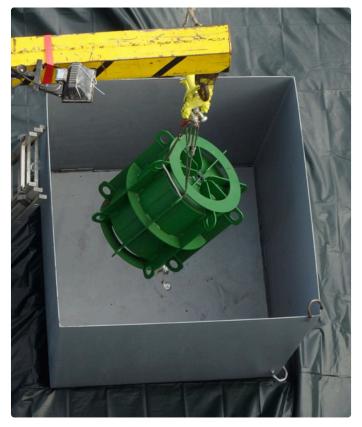
Three drop tests on the lower edge. The dimensions of the container are such that when suspended by the two upper eyelets the center of gravity lies almost exactly on the vertical passing through the point of impact, as required by ADR 6.1.5.3.1

• Test diagram





• First drop after being released









· Second drop while falling

• Third drop while falling

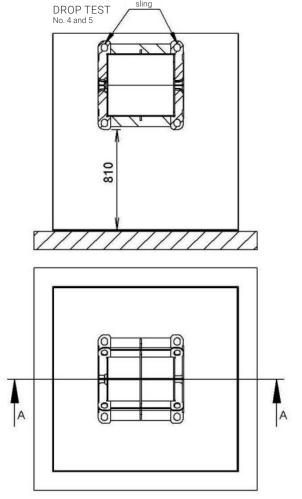
After the first drop, the eyelet, which serves as a deformation zone, was bent. The container always turned after the drop. After the second drop there was another deformation of the eyelet. After the third drop, the edge of the lower base was bent. There was no leakage or distortion of the welds.



P1.1.2 Pursuant to ADR 6.1.5.3.1

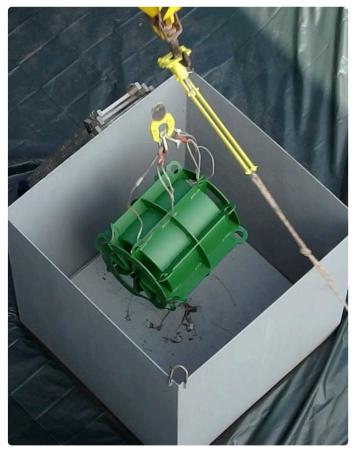
Two flat drop tests.

After the fourth and fifth drops, further deformation occurred on the already deformed eyelets. There was no distortion of the welds. On the fourth and fifth drops, there was a slight leak of mercury under the sealing O-ring of the plug, but no further leakage continued. The sum of the two leaks was less than one milliliter. After straightening and inspecting the container, it was found that the O-ring was pushed out slightly, but remained in place under the plug flange. It was decided that the ring would not be changed, nor would the plug be loosened and re-tightened, but on the contrary, the leakproofness would be determined even in this state by performing another drop.



• Test diagram

· Fifth drop while falling



Pátý pád v letu

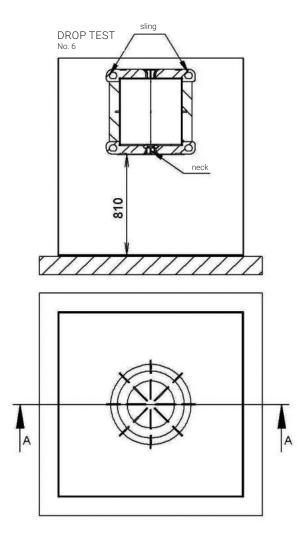




P1.1.3 Pursuant to ADR 6.1.5.3.1

One drop test on the weakest point. A flat face-up drop was chosen.

• Test diagram



· Sixth drop while falling



Deformation after the drop is minor. At the time of the drop, there was a small leak of mercury below O-ring a. Later measurements of the debris revealed that the size of the leak was 7 milliliters. The ring was slightly pushed out again, but it still remained in place under the flange of the plug.

P1.1.4 Result of the drop tests

• Leaked mercury after all six drops







• Deformed container after six drops







no deformation near the casing or any breakdown of the welds. After each drop, before straightening the container, it was determined whether leakage continued. The described leaks after falls 4, 5, and 6 were minor and did not continue. ADR 6.1.5.3.6.5 accepts this result as satisfactory.

The container passed the drop tests pursuant to ADR 6.1.5.3.



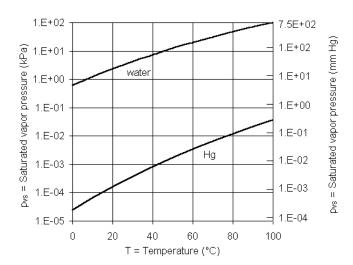
P1.2 Pressure tests

P1.2.1 Tests pursuant to ADR

ADR 6.1.5.4 leakproofness test with a pressure of 0.2 bar for 5 minutes.

ADR 6.1.5.5 internal pressure (hydraulic) test

Calculation according to 6.1.5.5.4 (a)



For greater safety, instead of 55°C, we use 70°C.

The partial pressure of saturated water vapor is approximately 30 kPa.

The partial pressure of saturated mercury vapor is less than 1 mm Hg, so it can be completely neglected.

The pressure contribution by heating the air is calculated from the situation of the filling at 0°C and subsequent heating up to 70°C:

A simplification using the equation of state for ideal gases can be considered acceptable.

p1V=RT1

p2V=RT2

so p2 = p1* T2/T1 where p1=100 kPa, T2=303K, T1=273K

then p2= 100*303/273 = 111kPa abs, i.e., overpressure 11 kPa

Contribution due to mercury expansion:

For simplification, the absolute not the apparent coefficient of expansion is taken, which is permissible because it is a tightening simplification.

b=182 *10 exp(-6)/K, i.e., 1.3% increase in volume when heated to 70°C.

Since the thermal increase in pressure was already taken into account as an isochoric process in the previous one, only the isothermal process can now be considered when reusing the equation p1V1=RT, p2V2=RT i.e., p2/p1=V1/V2, where according to the previous p2/p1=1.013.

So if we add 30kPa and 11kPa and multiply the result by 1.013, we get 45 kPa

With a safety factor of 1.5, we arrive at the result that the test overpressure should be 67 kPa (0.67 bar)



Such a low overpressure does not need to be tested with water and therefore the test was performed with air.

The container was exposed to a pressure of 1.4 bar overnight, for more than 12 hours, and there was no pressure drop.



Conclusion:

The container passed the leakproofness test pursuant to ADR 6.1.5.4 The container passed the pressure test pursuant to ADR 6.1.5.5

P1.2.2 Additional pressure test

The manufacturer supplies air extrusion equipment with a pressure of up to 2 bar for emptying the container. That is why, beyond the scope of ADR, we performed a pressure test of 3 bar for 30 minutes.



 $\bullet \ \textit{The container passed this test}\\$



Appendix 2 Declaration of Conformity, Reference Number As16072017-BO Welds on the Product

The container consists of a shell made of a rectangle of steel plate, a circular bottom, a circular ceiling with a central hole and a filling nozzle with a thread for a closing plug. These parts are welded using continuous welds. The number of parts making up the container is therefore the smallest possible to create a utilizable volume, and the number of welds is also the minimum possible.

ADR Section 6.1.4.1.2 requires parts to be welded and this is complied with.

In direct contradiction to this, Appendix 13 of Decree 93/2013 stated the following in Section 2(B): Containers used to store metallic mercury must be resistant to corrosion and impact. Therefore, there must be no welds.

If it really had to be this way, then it would be possible to use only molded containers with a volume of approximately 20 L at most (for larger ones, the ratio of volume and wall thickness of the throat would already be unacceptable), i.e., suitable for a maximum of 215 kg of mercury, and of course with the knowledge that that this manufacturing principle gives resistance to internal overpressure but it is highly unlikely that it would pass the drop test.

In contrast, all equipment with the highest degree of risk, such as boilers, high-pressure equipment in nuclear energy, pressure vessels of dangerous substances and others, are welded.

It is therefore necessary to investigate whether this provision was really the intention of the drafter of the regulation.

The German mutation it reads:

Behälter müssen korossionsbeständig und stoßfest sein. Schweißnähte sind daher zu avoidmen.

Enalish

Containers used for the storage of metallic mercury shall be corrosion- and shock-resistant. Welds shall therefore be avoided.

· Dutch:

Vaten die voor opslag van metallisch kwik worden gebruikt, moeten corrosie-en schokbestendig zijn. Lasverbindingen moeten daarom worden vermeden.

· Polish:

Pojemniki wykorzystywane do składowania rtęci metalicznej są odporne na korozję i wstrząsy. Zatem należy unikać spawów.

In all these language mutations, even without knowledge of the language, it can be seen that this is not a strict ban on welds, but a requirement for their minimal use:

It is easy to see that the original language of this document since its drafting was French:

in the French version, the expression "préférence" cannot be completely overlooked, which is perhaps meaningful in Czech as well.

Les conteneurs servant au stockage du mercure métallique doivent être résistants à la corrosion et aux chocs. Ils doivent donc de préférence être exempts de soudures.

So there is no doubt that the "weld ban" is the result of a completely incompetent translation.

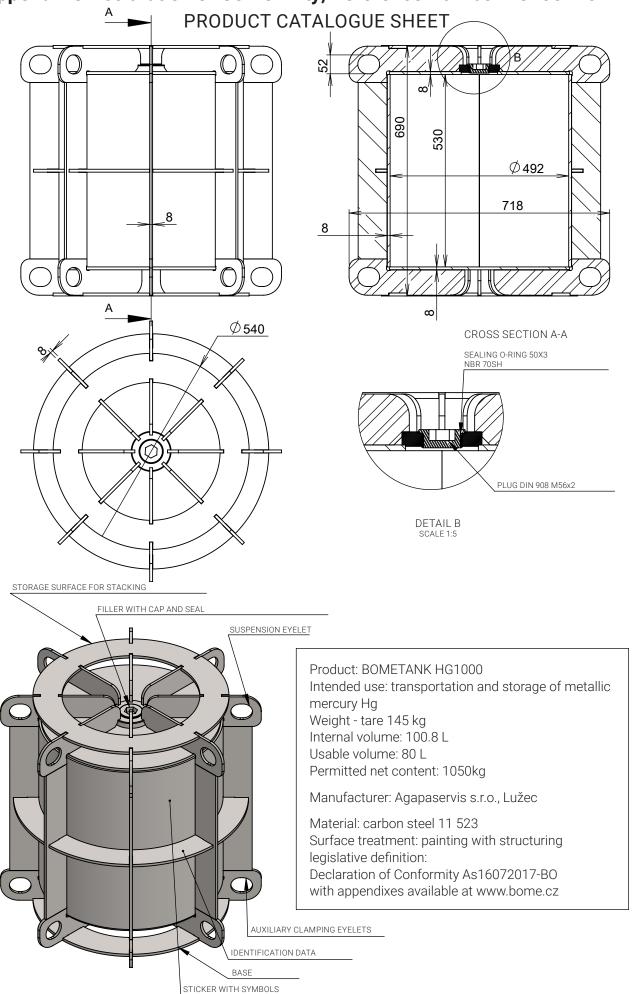
In view of the above, we declare that our product fully meets the requirements of Appendix 13 of Decree 93/2013

Ing. Jan Sedlák	Ing. Michal Provazník	Pavel Jelínek

Vraňany 18. 7. 2017



Appendix 3 Declaration of Conformity, Reference Number As16072017-BO





Appendix 4 Declaration of Conformity, Reference Number As16072017-BO Labelling, Production Records and Output Control of Products

P4.1 Numbering of containers

The container number is stamped on the central horizontal reinforcing ring

The number encodes both the production date and the sequence

The type of material, empty weight, and manufacturer are also stamped here

This information is compulsorily stamped into the container material pursuant to Decree 93/2013 and its Appendix 13(A)(3)(c)

For example: 30 July 2017, 3rd container

mat. 11,523, tare 145 kg Agapaservis s.r.o. 17073003

Furthermore, a label with the following information is attached to the central circle:

BOMETANK HG1000 producer Agapaservis s.r.o. tare 145 kg, net max.1050 kg Hg satisfied ADR + EU2011/0132 protocol As16072017-BO www.bome.cz for manipulation see the manual

Pursuant to Decree 93/2013 and its Appendix 13(A)(3)(d), the number of the declaration of conformity is indicated on the label. In order to facilitate the identification of containers in confined spaces, the container is also equipped with a tag with an identification number.

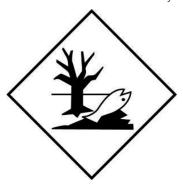
P4.2 Labelling containers with icons

Each container is labelled with a sign stating that it can be loaded with 2400 kg, which is two other containers on top of each other. The conditions that must be observed are specified in the user manual.

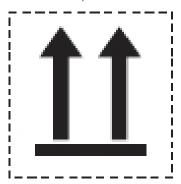




Another label is a mandatory symbol for the content of substances contaminating the environment in the event of a leak.



Furthermore, the container is labelled with a symbol stating to maintain its position with the opening facing up.



P4.3 Container records

The manufacturer maintains a database in which the following is recorded for each manufactured piece:

Container number
Date of manufacture
Customer code
Order Number
Material supplier code
Material delivery number
Vessel welder code
Rib welder code
Leakproofness test result
Paint shade number
Type of internal protection (waxing)
Result of the final inspection
Date of removal



P4.3 Production and output control of containers

Production control:

- P4.3.1. Control of the quality of blanks burrs, corrosion, checking the strength of the material, checking the type of material according to the delivery note
- P4.3.2 Control of the thread of the neck before welding
- P4.3.3 Leakproofness test of the container before welding the ribs with a pressure of 2 bar for 1 hour or in a water bath for 3 minutes
- P4.3.4 Control of the stamped data on the quarter circle before welding it
- P4.3.4 Control of the completeness of all rib welds before painting

Output control:

- P4.3.5 Control of painting
- P4.3.6 Control that the neck thread is undamaged
- P4.3.7 Control of the presence of the plug and O-ring and lubrication of the thread
- P4.3.8 Control of stuck-on label
- P4.3.9 Control of stuck-on symbols

The manufacturer complies with all of the control tasks for each container.



Appendix 5 Declaration of Conformity, Reference Number As16072017-BO User Manual

P5.1 Intended use of the product

The BOMETANK HG1000 container is intended for the transport and storage of metallic mercury.

The nominal filling is 1000 kg of mercury.

The maximum filling is 1050 kg of mercury.

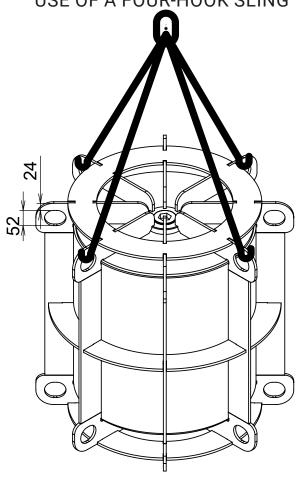
Corrosive substances, especially water, Iye, and acids, must not be filled together with mercury.

P5.2 Manipulation

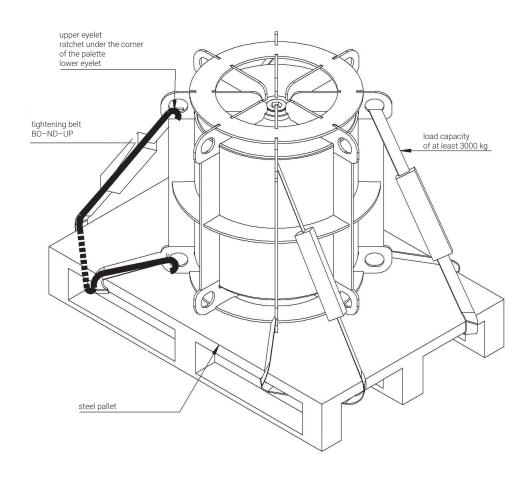
ARRANGEMENT FOR MANIPULATION WITH A FORKLIFT 666 0 HO) 1200 g max 1205 kg in total (BO-ND-TT lifting rods (see the spare parts catalogue) Ø 608



USE OF A FOUR-HOOK SLING

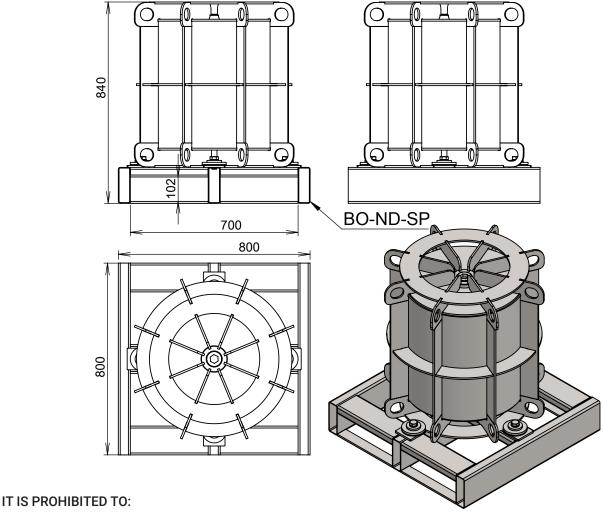


FASTENING ON A STEEL PALLET





FASTENING ON A SYTEM PALLET



- · manipulate the container directly on the forklift forks
- · insert the forks between the shell and the reinforcing rings
- · manipulate the container using rods without locking pins fasten the full container with a rope sling in a different way than in the illustration
- place, clamp and in any way manipulate the container on a non-steel pallet with a load capacity of at least 1500 kg, or on a system pallet
- · manipulate a full container on a non-system pallet when it is not properly secured with belts
- · transport and lift a full container if the plug is not properly screwed and tightened
- STACKING OF CONTAINERS DURING TRANSPORTATION IS STRICTLY PROHIBITED (permitted during storage, see below)

IT IS NECESSARY TO:

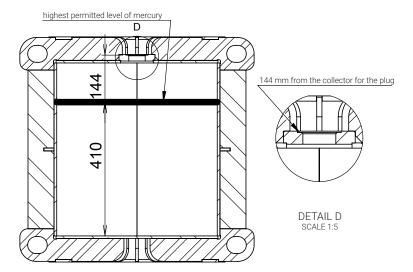
- · support the belts in a suitable way if the used pallet has sharp edges
- remember that a full container is tested for a drop from a height of 80 cm and therefore any manipulation at a greater height is potentially risky and extra caution must be taken

Empty containers may be transported on their side.



P5.3 Filling

Není-li možno kontejner zvážit, je nutné kontrolovat výšku hladina po naplnění. 144 mm odpovídá 1050 kg. Pro jmenovitou náplň 1000 kg je tato míra 162 mm



When filling from smaller containers, it is necessary to use a funnel with a steep angle (BO-ND-N), otherwise the mercury will spill out. After filling and before any further manipulation, the container must be closed with a stopper using the BP-ND-K key. Before doing so, it is always necessary to check whether the BO-ND-OZ O-ring is threaded under the collar of the plug.

P5.4 Emptying

The BO-ND-VA device is intended for emptying. Follow the instructions included with this device. In terms of chemical safety, even an emptied container is subject to the same regime as a full one.

P5.5 Storage

Containers are permitted to be stored in two layers.

Storage in three layers is permitted if it is ensured in a suitable way that the container in the third layer cannot fall from a height greater than 80 cm. Binding on the eyelets is permitted in any way.

Containers should be stacked parallel to each other.

When stacking, the lower container must not be placed on the pallet

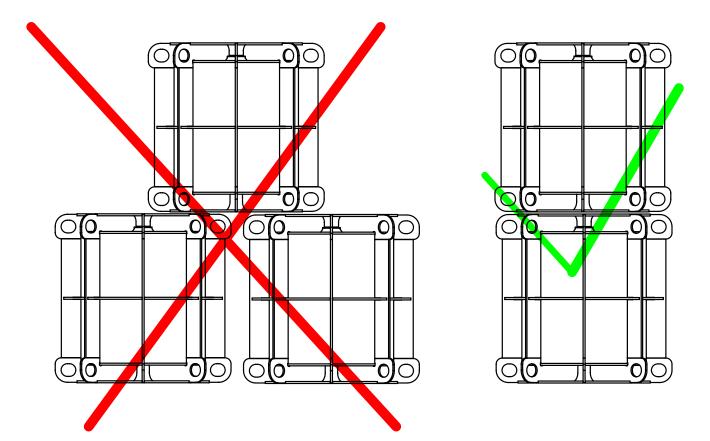
When stacking in three layers, the slope of the floor must not be less than 1.5°

The firmness of the floor must correspond to the required load.

It is suitable to use secondary containment with a volume of 100 L

A container that is damaged after falling may not be stacked.





P5.6 Damage

A container damaged by a fall is suitable for use if it does not have a deformed lower storage surface and if the upper eyelets are usable for safe suspension.

A container with any damage to the casing must not be used!

Any significantly damaged container is recommended to be sent to the manufacturer for repair. A container with a damaged neck thread is not usable.

P5.7 Revision

Five years after being put into circulation, the container must be revised by the manufacturer or a person authorized by one of the entities stated in point 1 of the Declaration of Conformity.

P5.8 Disposal of discarded containers

Discarded waste may contain small droplets of mercury or the inner walls may be contaminated with amalgams or sulfides. Cleaning is possible mechanically after cutting into two parts or chemically using a 5-10% sodium hypochlorite solution (filling for one week). All waste (excluding the steel body) generated during cleaning must be viewed as mercury-containing waste and as such must be handed over to an authorized person for disposal.

An alternative is take-back for disposal free of charge to BOME s.r.o. to the company address:

BOME s.r.o. Parkány 550 361 95 Bechyně

Contact person:

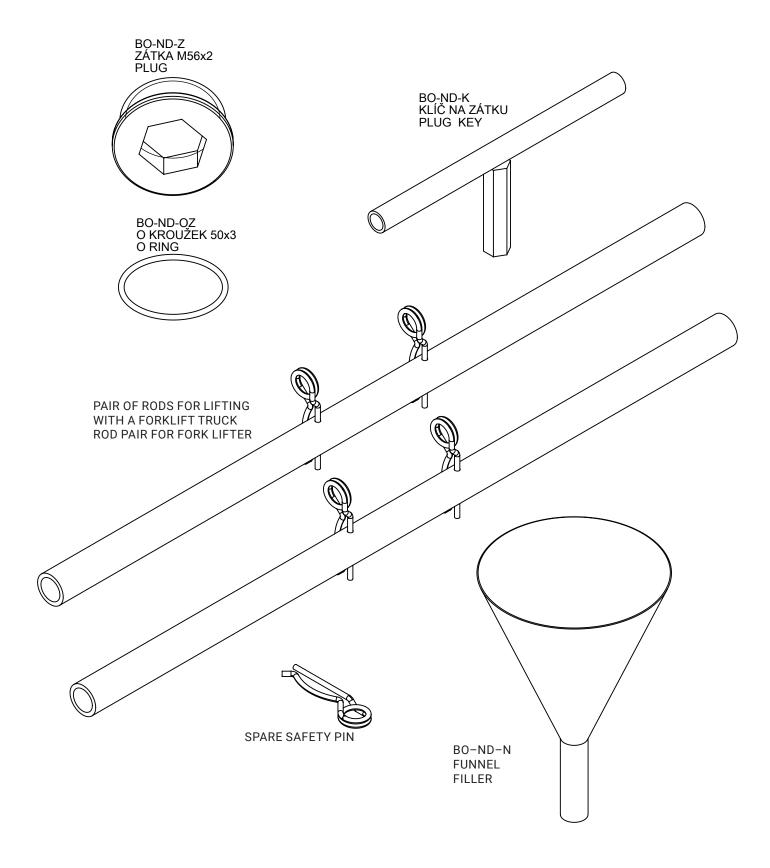
ing. Michal Provazník +420 602 169 465 info@bome.cz



Appendix 6.1 Declaration of Conformity, Reference Number As16072017-BO

Orders: info@agapaservis.cz Product: BOMETANK HG1000

Intended use: transportation and storage of metallic mercury Hg Manufacturer: Agapaservis s.r.o., Lužec

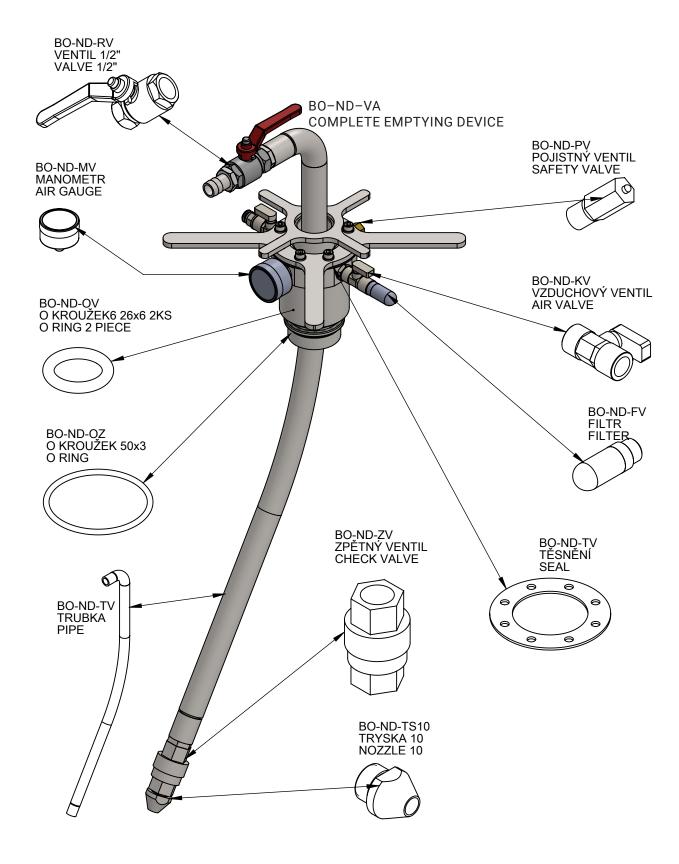




Appendix 6.2 Declaration of Conformity, Reference Number As16072017-BO

Orders: info@agapaservis.cz Product: BOMETANK HG1000

Intended use: transportation and storage of metallic mercury Hg Manufacturer: Agapaservis s.r.o., Lužec



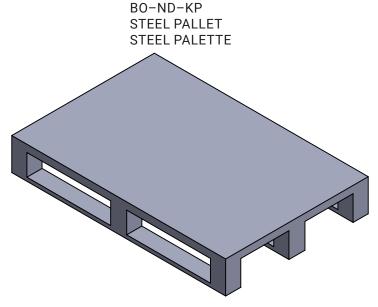


Appendix 6.3 Declaration of Conformity, Reference Number As16072017-BO

Orders: info@agapaservis.cz Product: BOMETANK HG1000

Intended use: transportation and storage of metallic mercury Hg

Manufacturer: Agapaservis s.r.o., Lužec

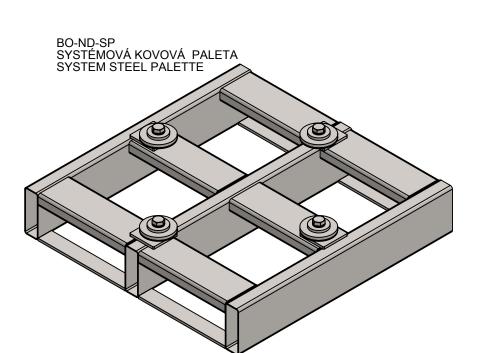




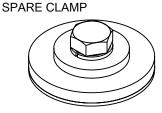




BO-ND-ZN2 PRÁŠKOVÝ ZINEK 2 KG ZINC PULVER 2KG











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V Jezírku 544 252 43 Průhonice

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IČO: 47217201 DIČ: CZ47217201

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