

**BUPOLSA – BURGOS**

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**BUPOLSA – MELGAR DE FERNAMENTAL**

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**POLYESTER TANKS REINFORCED WITH FIBREGLASS**



**CHEMICAL INDUSTRY, FOOD, STORAGE OF FUELS, ALL LIQUIDS AND SOLIDS DESALINATION, CLEANING EQUIPMENTS**

**STANDARDS OF IMPLANTATION, USE AND MAINTENANCE**

Rev 2014-09-03



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### **STANDARDS OF IMPLANTATION, USE AND MAINTENANCE**

You are to install and handle one or more storage tanks for various products, among them ones for chemical products, manufactured by BUPOLSA following a procedure tested along the last 25 years.

The procedure of FILAMENT-WINDING for the manufacturing of the ferrules, together with the SIMULTANEOUS SPITTING for the manufacturing of the bottoms by computer digital control (CNC) used by BUPOLSA has as a durable and reliable system, the best reputation face the important compromise of the meaning of security for the persons, the goods and the environment, of products which once dumped could produce important damages.

The acquired material has been designed and built according the German Standard Ad Merkblatt N.1.

The raw materials are produced by selected firms and have to undergo strong technical acceptance tests before BUPOLSA agrees with their use.

The manufacturing of the ferrules, the bottoms, the walls and all the soldering are realized by special qualified people with the handling of reinforced polyester fibreglass according written and agreed procedures.

### **VERY IMPORTANT WARNINGS**

Every PRFV tank has been calculated and built for the storage of a determinate product. Don't change the use of the said tank without consulting us and without the assistance of a competent technician.

Don't modify the tanks without consulting us and without the assistance of a competent technician.

**In those cases, BUPOLSA is not responsible.**

### **1.- LIFTING DEVICES**

Where the lifting device contacts the PRFV surface, we must use flat slings made with synthetic fibre. The width of the sling has to be 80mm.

### **IMPORTANT**

**Don't use the tank pipes or accessories, as download fixation because this is not their function**

### **2.- IMPLANTATION**

The installation has only to be realized by specialized people.

#### **2.1- Previous checking before installation**

Before install you have to check that:

- the support or foundation structures are appropriate for the installation;
- the support or foundation structures are inside the specific tolerances.
- if necessary protect the article for flotation.



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### **2.2.- Preparation of the installation place**

The support structure of the fibreglass reinforced tanks has to be agreed by BUPOLSA standard.

#### **2.2.1.-Tanks support and erection preparation.**

##### **Tanks with flat bottom**

- The BUPOLSA tanks have to be planted and installed on smooth, flat and uniform surfaces, on a bed rigid enough to resist the sufficient pressure, calculated by a competent technician.
- In some special cases, when a total drain bridge is incorporated to the tank, an inspection of the characteristics of the bed, has to be realized before the implantation of the tank. The meaning of this inspection is only to check the presence of a cassette determined according to the position of the said drain's bridge.

##### **• Installation on flat and uniform surfaces:**

The foundation has to be flat levelled with a levelling difference less than 2mm/m and a total maximum deviation of 5mm. The tanks with a flat bottom have to be vertically erected with a maximum deviation of 0,5°.

##### **• Use of bed's materials by the installation:**

In case of either the foundation or the tanks bottoms present a level difference, we have to use a levelling mass (anti-corrosive if necessary) thick enough to ensure the contact between the foundation and the bottom. That's the way, to entirely cover all the irregularities, uniformities variations and all small defects of the bed, using this mass which exceeding will be ejected by the own weight of the tank when lifting.

**NOTE** – The levelling mass, for example, cement mass, river sand, sand and bitumen mixture, rubber, bitumen felt have to be placed just before the erection making sure the orientation marks can be visible. The bed's materials have to be covered to avoid any adhesion to the tank.

### **IMPORTANT**

BE SURE OF THE CORRECT UNIFORMITY OF THE BANK, THE ABSENCE OF PUNCTURED ITEMS, SHINGLES, AND PIECES OF CONCRETE OR ANY TYPE OF EDGE WHICH MAY MARK OR DAMAGE THE FLAT BOTTOM OF THE TANK.

ALSO BY THE SPREADING OF THE LEVELLING MASS (ANTI CORROSIVE IF NECESSARY) ANY TYPE OF ROCKS, STONES, PUNCTURED ITEMS..., HAVEN'T TO BE PRESENT.

WHEN SETTING THE TANK ON THE BED, WE MUST CHECK HIS PERFECT SETTLEMENT AND THE ABSENCE OF HOLES BETWEEN THE BED AND THE FLAT BOTTOM OF THE TANK.

**FOR PLACEMENT OF BOLTS, THE TANK SHALL BE ON HIS FINAL LOCATION. TO DRILL, USE THE HOLE ANCHOR AS A TEMPLATE. THE BOLT ANCHOR WILL BE (TYPE MECHANICAL OR CHEMICAL).**

**BOLTS SHOULD NOT PUT BEFORE THE INSTALATION OF THE TANK, AS IT IS VIRTUALLY IMPOSSIBLE TO MATCH THE HOLE AND THE ANCHOR. BUPOLSA NOT RESPONSIBLE OF THIS PRACTICE OF THE CUSTOMER**

WHEN SETTING THE SPRING CLIPS ON THE ANCHORAGE OF THE TANK, WE HAVE TO TIGHTEN THE FEMALE SCREWS UP TO THEY CONTACT THE ANCHORAGE, NEVER TIGHT TO THE TOP OR FORCE THE ANCHORAGE UP TO THE BED. FOR THE UNDER BODY PART, WE HAVE TO LEAVE AN HOLE LARGE ENOUGH FOR THE TANK.

THE NO RESPECT OF THOSE ADVICES MAY, IN THE FUTURE, CAUSE THE RUPTURE OF THE FLAT BOTTOM.



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**When one of the indications included in these instructions won't be respected, BUPOLSA declines any responsibility over the consequences.**

### **• Installation on piles or Buttress bracing :**

The installation on piles, buttress bracing or frames has to be realized according the design.

### **- Verticals Tanks with circumferential ferrule support or type“Long ferrule:**

The vertical installation of the tank has to be realized with a deviation maximum of 0,5°. The alignment can be fixed setting appropriated support stop blocks for the charge at both sides of the anchorage pin.

### **- Verticals tanks with support legs:**

The vertical tanks with support legs haven to be vertically installed with a maximum deviation of 0,5° and be safety fixed to the support structure. A material able to support the charges to ensure the uniform support of the tank has to be used.

Is very important to spike the spring clip at the centre of the orifices located on the legs.

### **- Horizontals aero tanks with taper:**

The BUPOLSA tanks have to be installed on smooths, flats and uniforms surfaces, on a bed rigid enough to resist the sufficient pressure, calculated by a competent technician.

The horizontal tanks with support legs haven to be horizontally installed with a maximum deviation of 0,5° and be safely fixed to the support structure. A material able to support the charges to ensure the uniform support of the tank has to be used.

In case of either the foundation or the tanks bottoms present a level difference, we have to use a levelling mass (anti-corrosive if necessary) thick enough to ensure the contact between the foundation and the bottom. That's the way, to entirely cover all the irregularities, uniformities variations and all small defects of the bed, using this mass which exceeding will be ejected by the own weight of the tank when lifting.

**NOTE** – The levelling mass, for example, cement mass, river sand, sand and bitumen mixture, rubber, bitumen felt have to be placed just before the erection making sure the orientation marks can be visible. The bed's materials have to be covered to avoid any adhesion to the tank.

It is very important to spike the expansion spring clip in the centre of the orifice of the taper when anchorages are detected.

### **-Under ground horizontal tanks:**

For the tanks type “*Underground horizontal tanks*”, look at the entering in the soil standards on the cover of the tank, detailed page 8 of this handbook.

**NEVER FILL THE TANK WITH OUR BEFORE BEEING PREVIOULY SET UNDER THE GROUND AS INDICATED BY THE STANDARDS ABOUT THE SETTING IN THE SOIL OF THE BUPOLSA EQUIPMENTS**  
**(Included on one of the cover of the tank)**

**For any question please contact ours technicians.**



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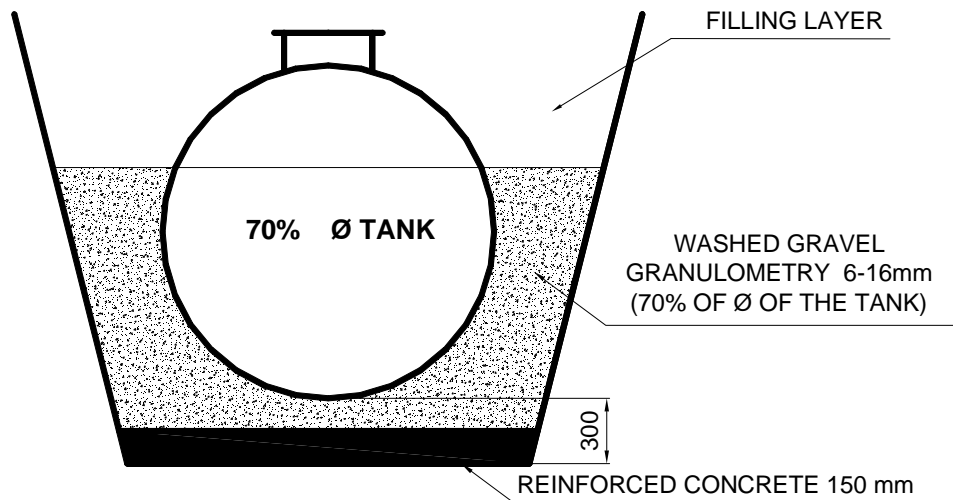
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### **STANDARDS FOR UNDERGROUND “BUPOLSA” EQUIPMENTS**



1. When excavating, keep in mind an overshooting of 30 cm minimum over the sizes of the equipment like shown on the graphic.
2. Compact the ground and built a granolithic concrete with a mass as smooth as possible with a thickness of 15 cm. Set the equipment on a 15 cm fine gravel layer perfectly levelled.
3. Set the tank on the said layer.
4. Level the tank and fix it.
5. The excavated soil has to be filled with washed gravel, screened and free of dust, clay, organic material and with a granulometry between 6mm and 16mm. (70% of the tank diameter).
6. Fill the tank and check for the existence of leaks. For the rest of the tank backfill is to use the ground of the excavation, free of items which could damage the outsides walls of the tank.

#### **IMPORTANT:**

7. When vehicles have to go over the place of the tank, we have to built a concrete slab going out with a minimum of 50 cm of the excavation supported by a peripheral shoe.
8. The superior filling on the tank won't exceed 20 cm.
9. The access mouths have always to be free to warrant the perfect ventilation.

**Note: IF YOU DON'T FOLLOW THIS STANDARD, BUPOLSA DECLINES ANY RESPONSIBILITY OVER THE CONSEQUENCES.**

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### **- Tanks with accessories**

The ladders, platforms and others accessories have to be fixed as shown on the design, without any mass stress abuse on the tank.

### **3.- CONNECTION**

The with fibreglass reinforced polyester tanks may be connected with every type of services with the followings cautions:

#### **3.1- Accessories support**

The entry and exit valves and taps and the direct connections to the pipes as well, have to be supported on a way to protect the PRFV pipes fixed on the tank from the charges and deforming stresses.

#### **3.2- Joints**

Use neoprene rubber joints with identical sizes as the connect bridle plate.

The sizes of the bridles plates and the matchings drills have to be as STANDARD DIN 2576 – PN10 (without other standard specification for the drills or the sizes of the plates).

The polyester cover bridles have to be supplied with a neoprene rubber joint as the following technical characteristics:

#### **Technical characteristics**

Hardness Shore A	between 60 and 65
Colour	black
Temperature	-20/100 °C
Specific weight gr/cm3	1,45
Breaking charge kg/cm3	60
Application field	Ageing, oils, marine environment
Chemical Resistance	ozone and acids

#### **3.3- Screwing**

##### **3.3.1.-Screwing the anchorages (In suitable case)**

The tank is provided with hot galvanized iron anchorages with a Ø30mm drill. It is advised, once the tank is setted to drill "in situ" with Ø28mm drift spin and also to insert metallics anchorages of Ø28mm.

When setting the spring clips on the anchorage of the tank, we have to tighten the female screws up to they contact the anchorage, never tight to the top or force the anchorage up to the bed. For the under body part, we have to leave an hole large enough for the tank.

##### **3.3.2.-Screwing the bridles**

The opposites screws have to be tighten couple by couple. The following couple of screws have to keep a major angle in front of the axis of the previous couple.



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### **3.4- Tighten**

#### **3.4.1.-Tighten to place the connections**

The female screws have to be tighten up to the contact surface. They will be later tighten gradually one by one up to be hermetically closed.

### **WARNING**

**Never go up the mouths, pipes and accessories.**

## **4.- COMMISSIONING**

### **4.1.- INSIDE CLEANING**

BUPOLSA delivers the tanks cleaned by a simple aspiration. The technician, responsible for the installation of the tanks has to make out if according the to be contained products an additional cleaning is necessary and do what is suitable.

Before the filling, is VERY IMPORTANT to check the presence of water inside the tank, specially when it will contain Sulphuric acid, because the exothermic reaction could irremediably damage the tank.

### **4.2.- VENTILATION**

We have to check obligatory the working of the ventilations openings, as they have been packed for the transport and could be obstructed or dirty.

**ANY OBSTRUCTION OR MODIFICATION REALIZED BY THE USER MAY CAUSE GRAVES ACCIDENTS.**

### **4.3.- INSPECTIONS**

After the complete installation, the tank has to be inspected as follows:

- The visual inspection indicates the general condition of the tank, the state of the material of the wall, the bridles, the connections and the links. The external and internal surfaces have to be inspected when impacts damages or abrasions happened during the transport, the download or the installation of the tank.

## **5.- MANTENANCE**

The maintenance is a set of preventives and no preventives matters used to make possible the availability of the tanks and avoid all the dangers for the health and the environment during their lifetime.

For the PRFV tanks of BUPOLSA, no special care is needed.

Their surface don't need to be painted or protected and may support bad weather during a lot of years by any environment.

**Once a year an external and internal visual inspection is suitable.**



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### **5.1.- SERVICE CONDITIONS**

- The tanks as described in this document have specific materials and have been designed for a specific service conditions.
- The service conditions are limited to specific contents, its concentration, relative density and static pressure, work pressure, work temperature and filling and draining stream speed.
- When the maintenance procedure has been decided, we have to keep in mind the operative practice, e.g., filling and draining middles, variation of the work temperature or change of flow.

### **5.2.- ANNUAL INSPECTION AND MAINTENANCE PROGRAM**

#### **5.2.1- Screwed manhole**

Check and replace if necessary

- State of tightness and corrosion of the flat joint.
- State of the screws and tight them.

#### **5.2.2- Draining and filling pipes**

Check and replace if necessary

- State of the corrosion of the joints.
- State of the corrosion of the screws.
- Tight the screw in the bridles (see point 3.4)

#### **5.2.3- Ventilation**

- Check if every thing is clean and if they may be obstructed by some items.
- Check for the presence of siphons caused by condensation gases.

#### **5.2.4- Ground fixation legs**

Check and replace if necessary

- State of the corrosion and tight the screws.
- Right setting of the legs as shown on the design.

#### **5.2.5- Floater level**

Check and replace if necessary

- State of the corrosion of the Polypropylene cord.
- State of the corrosion of the counterweight outside and inside.
- Free slipping of the cord and counterweights.
- Transparency of the PVC GLASS pipe
- State of the joints.

#### **5.2.6- Pneumatic controller level for liquids (Filsa levels)**

Check and replace if necessary

- Tightness of the union of the with the controller, threaded pipe.
- State of the corrosion of the electric connections and cables
- Right electric working.



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### **5.2.7- Heating system.**

Check and replace if necessary

- State of the corrosion of the bridle, joints and screws.
- State of the corrosion of the electric connections and cables.
- Right conductivity of all the resistances.
- Clean the crystallizations in tubes or racks which may reduce the electric efficiency and burn them.

### **5.3.- CLEANING AND SERVICE**

**5.3.1.-**The tanks and the security devices have to be kept clean and operative to the withdrawal of the service.

Cleaning and maintenance have only to be realised by specialized people.

For the cleaning and maintenance, keep in mind the appropriate standard over accidents prevention, for example, personal protection equipment and security equipments.

**5.3.2.-**Before cleaning, the containers have to be drained, free of gases, the pipes systems isolated and disconnected from electricity. The cleaning methods and the products or used liquids haven't to produce harmful effects for the containers like fissures caused by the stress.

**5.3.3.-**All the used liquids and products and all the residues as well, have to be stored and clean under control.

#### **Five years obligatory revision:**

Legally, the tanks containing chemicals products have to be revised after five years use.

#### **BIBLIOGRAPHY**

UNE-EN 13121-4=2005

Tanks and with fibreglass reinforced plastics containers (PRFV)  
Part 4 Delivery, installation and maintenance.



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### **SECURITY INSTRUCTIONS (ATMOSPHERICS EQUIPS)**

#### **STORAGE AND TRANSPORT.**



The tank has to be installed on a surface with enough stability.  
Before installation, the tanks have to be stored empty and fixed with the appropriated middles.

Check the tank before the transport to avoid damages like local buckling, deformations, and broken pieces.

En case of damages, they have to be repaired by authorized people before going on using it.

Before every download and transport, be sure that:

- In the first place all appropriate middles are available.
- Check if you have all available middles for the equipment(handling eyes bolts and/or appropriated slings) are in optimum conditions for this work.
- The montage pieces are fixed, when they are included in the equip.
- All the openings with cover are closed.
- The equip is completely empty and doesn't contain any fluid.

#### **SETTING OF THE TANKS.**

**IMPORTANT:** check that the equip is completely empty and doesn't contain any fluid.

The surface where the tank has to be setted is stable enough.

When anchorages are available on the tank, they have to be use to prevent any accidental movement once the tank is full.

Avoid hitting the tank, because it may affect his correct working and structural stability.

#### **SETTING THE PIPES.**

For the substitution of any type of parts the use is doing with the authorization of the manufacturer, he always has to be sure that the equip has been disconnected from the electric net (if connected) and empty of fluids to avoid an inadvertent start and possible damages.

#### **INSTRUCTIONS FOR THE START.**

Before filling, check the equip to avoid damages like local buckling, deformations and breaks, including the supports in case they are used. The damages have to be repaired by authorized people before going on with the use.

Check the tank is set and perfectly placed.

Check the twinning, because they have to be perfectly clean to realize the linkage without loosing fluids which may cause a risk of damages.

#### **CONNECTIONS**

Before handling the connections, you have previously to drain completely opening the valves.



When a manhole is available on the tank, don't release the bolts before to be sure if the tank is completely empty of fluid

Change the rubber joint as soon as necessary.

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### **CLEANING THE TANK**

Empty the tank to completely to free it of all the stored fluid.  
Check the tank inside.



When the tank has to be used to store any toxic and/ or corrosive product, the authorized people have to adopt all the necessary security matters to avoid inhalation and contact with the contained fluid.

It is obligatory before to realize any cleaning and/or maintenance operation to check if the inside of the tank is enough ventilated.

### **DANGERS BY WRONG USE**

Never put the tank under a pressure higher than the service pressure to avoid his explosion and putting in danger the life of the persons around.

Don't handle any pipe and the connections when the tank contains fluid, the fluid could be projected on the operator, his physical integrity and his life could be in danger. Before starting any handling, be sure the tank has been previously drained.

Be sure of the the state of the connections to avoid any disconnection and that the fluid could be projected on the operator.

When detecting a leakage, report it immediately to the manufacturer for instructions on how to repair it.

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**INSTRUCTIONS TO USE AND SECURITY**

There is no foreseeable risk by the working of those tanks as it has been specially cared for the followings elements:

The mechanical design the pipes warrant the airtightness to avoid possibles leaks. Before to work, completely drain the tank.

The joints have to be replaced as soon as necessary.

Be sure of the state of the connections to avoid disconnections and projections to the operator.

The maximum pressure service of the tank and the maximum temperature of the equip can't be exceeded.

**FREQUENTLY RISKS**

POST SETTING AND HANDLING AND / OR REPAIR OF THE PRFV TANKS		
<i>Frequently risks</i>	<i>Risk factor</i>	<i>Conditions</i>
<ul style="list-style-type: none"> <li>• 01- People fall on different level</li> </ul>	<ul style="list-style-type: none"> <li>• Work platforms opening floor or wall</li> </ul>	<ul style="list-style-type: none"> <li>• Works over two meters over the floor have to be realized on platforms equipped with security hand rails or telescopic lifting platforms</li> </ul>
<ul style="list-style-type: none"> <li>• 04- Items fall by handling</li> </ul>	<ul style="list-style-type: none"> <li>• Hard handling items</li> </ul>	<ul style="list-style-type: none"> <li>• Periodically check the state of the handling rings, handle the tanks as handling procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• 05- Loose items fall</li> </ul>	<ul style="list-style-type: none"> <li>• Hard handling items</li> </ul>	<ul style="list-style-type: none"> <li>• Fix the elements with appropriated mechanical middles and set them using the crane.</li> </ul>
<ul style="list-style-type: none"> <li>• 09- Strikes/ cuts with items or tools</li> </ul>	<ul style="list-style-type: none"> <li>• Hand tools</li> </ul>	<ul style="list-style-type: none"> <li>• To cut any type of element use security tools.</li> </ul>
<ul style="list-style-type: none"> <li>• 10- Projection of pieces or particles</li> </ul>	<ul style="list-style-type: none"> <li>• Hand tools</li> </ul>	<ul style="list-style-type: none"> <li>• Use security glasses when using the sander (with disc). Obligatory use the respiratory mask for the dust during all operations outside the tanks.</li> </ul>
<ul style="list-style-type: none"> <li>• 11- Immobilized by /among items</li> </ul>	<ul style="list-style-type: none"> <li>• Machines</li> </ul>	<ul style="list-style-type: none"> <li>• Download and setting have only to be realized by qualified people specially authorized.</li> </ul>
<ul style="list-style-type: none"> <li>• 13- over stresses</li> </ul>	<ul style="list-style-type: none"> <li>• Hand handling loads</li> </ul>	<ul style="list-style-type: none"> <li>• Handel the loads as indicated in the load handling handbook, use mechanical middles.</li> </ul>
<ul style="list-style-type: none"> <li>• 16- Exposure to electric contacts</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect electric contact</li> </ul>	<ul style="list-style-type: none"> <li>• Use long cables and electricity intakes in perfect conditions.</li> </ul>
<ul style="list-style-type: none"> <li>• 21- Fires</li> </ul>	<ul style="list-style-type: none"> <li>• Flammables Materials</li> </ul>	<ul style="list-style-type: none"> <li>• Follow the emergency procedure, don't realize hot without express authorization.</li> </ul>
<ul style="list-style-type: none"> <li>• 23- Over run or strike by vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Self propelled industrial vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Keep out the traffic zone of the self propelled industrial vehicles traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• 27-Exposure to contaminants chemicals</li> </ul>	<ul style="list-style-type: none"> <li>• Chemicals Products</li> </ul>	<ul style="list-style-type: none"> <li>• Obligatory use of the respiratory mask for the styrene during all the repairs and handling.</li> </ul>



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