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Inspection Instruction No.: PA-03-04

Inspections of the BU-D Package within the Scope of Maintenance, of Regular and Periodic Inspections

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1	Chapter 7 and Attachment 2 new	W. Bergmann 14.10.2013	T. Breuer 14.10.2013	F. Hilbert 14.10.2013	C. Kuschke 24.10.2013

1. Object and field of application

The object of these inspection instructions is to determine the conditions for the inspection of transport casks of type BU-D within the scope of maintenance and periodic inspections. Furthermore the instruction contains requirements for repair measures.

2. Scope and date of inspections

Scope and date of inspections are defined in the higher ranking instruction.

3. Qualification of the inspection personnel

Personnel carrying out inspections must be familiar with the inspection instructions and the drawings of the transport cask and must be capable of carrying out visual inspections.

Furthermore, the requirements put forward in the higher ranking instruction are valid.

4. Documents

The drawings and parts list belonging to the cask have to be available for the regular and periodic inspections. During the maintenance within the scope of handling these have to be taken into regard for the evaluation of unacceptable inspection results.

5. Conditions of visibility

Good illumination must prevail at the inspection site at the time of inspections, e.g. daylight or artificial light of 500 Lux at least (this corresponds to lighting conditions 1 m from an 80 W fluorescent lamp). Disturbing light influences, e.g. reflections, are not allowed.

6. Inspection performance, assessment and evaluation

6.1 Visual inspections

The various components of the transport cask are submitted to visual inspection covering:

- Cleanliness
- Condition of the paint
- Surface conditions
- Irregularities and damages
- Corrosion
- Completeness

The criteria for visual inspections are found in the drawings and parts lists as well as in the instructions in Attachment 1 to these instructions.

If any dents are found during the visual inspection, which apparently are within the admissible scope of error, they shall be measured with a steel ruler and a slide gauge.

6.2 Wall thickness measurement

Wall thickness shall be checked randomly on 5 % of the transport casks to be inspected, using an adequate ultrasound wall thickness measuring unit.

Three points each on the exterior package and on the interior package shall be determined randomly. The allowable deviations of the wall thickness are specified in Attachment 1.

6.3 Inspection of threads with gauge ring and plug

The threads are inspected for:

- Cleanliness
- Mechanical damages
- Dimensional accuracy of the threads

The criteria for the inspections have to be taken from DIN ISO 1502, the instructions in Attachment I and the instructions of the higher ranking instruction.

7. Special information for repair measures

7.1 Repair of paint damages

For the repair of paint damages at the outer and inner container respectively for new painting only paints may be used for which a certificate according to DIN 25415 or ISO 8690 exists which certifies at least good decontamination properties. The information of the manufacturer has to be observed during painting.

7.2 Removal of corrosion at the insulating disc

If corrosions are detected at the zinc-coated plates of the insulating disc these have to be removed for example by sandpapering. After this the insulating disc has to be painted with a primer coat if necessary.

7.3 Repair of the thermal insulation

If cracks or spalling at the surface of the thermal insulation between inner and outer container are detected these have to be repaired.

For this the concrete at the affected area is largely removed and repaired by applying new light concrete at the surface. To get an even, smooth surface it is recommended to use a template according to Attachment 2.

When mixing the light concrete as far as possible the composition of perlite, cement and water according to material data sheet WB-02-04 has to be observed. The use of tylose and air-entraining agent is not necessary because these are only necessary for the better pouring of the complete container but not for surface repair.

After the repair of the light concrete surface it has to dry at least for 24 hours. After this the surface has to be sealed with decontamination paint.

7.4 Cleaning of the thread holes of the hexagon nuts of the inner container

The threads of the hexagon nuts of the inner container can get dirty with residues of the light concrete. These residues have to be removed especially for the gauge test. To prevent a damage of the threads during the cleaning this should be done as conserving as possible by brushing and exhausting of the residues. In the case of bond-

ed adhesions the thread should be cleaned manually with a die. It has to be paid attention to the correct positioning of the die.

8. Documentation

The results of inspections shall be recorded when this is required in the higher ranking instructions. If overhauling tasks are required (with exception of cleaning works), they also have to be documented.

Attachment 1: Inspection criteria

Inspection instructions: PA-03-04, Rev. 1

Component: Package identification

Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
Package identification	Legibility	Illegible signs	Restore readability by painting
	Completeness	Missing signs	Correct signs with stencil
	Conformance with package log book	Deviations	Correct package marking with stencil

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1	PA-03-04 Rev. 1	W. Bergmann 14.10.2013	T. Breuer 14.10.2013	F. Hilbert 14.10.2013	C. Kuschke 24.10.2013

Inspection instructions: PA-03-04, Rev. 1

Component: Outer container			
Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
Basic body (outer surface and accessible inner surface)	Surface conditions	<u>Maintenance</u> Dirt, if it can impair the function of the package <u>Regular and periodic inspections</u> Dirt	Cleaning
		<u>Maintenance</u> Damaged paint (cracks, flaking) with an extension greater than 1 cm ² <u>Regular and periodic inspections</u> Damaged paint (cracks, flaking)	Repair painting
		<u>Maintenance</u> Signs of corrosion with an extension greater than 1 cm ² <u>Regular and periodic Inspections</u> Signs of corrosion	Derust, repair painting In case of significant material abrasion perform a wall thickness measurement and record in the package log book; If the measured wall thickness is more than 25 % below the requirements of the drawings the cask has to be separated resp. repair measures have to be agreed with BAM
	Mechanical damages	Holes and cracks, dents with a depth greater 30 mm, sharp edges	Separate cask resp. agree with BAM on repair measures
	Wall thickness	Wall thickness is below 25 % of the nominal wall thickness	Separate cask resp. agree with BAM on repair measures
Lid (outer and inner surface)	Surface conditions	<u>Maintenance</u> Dirt, if it can impair the function of the package <u>Regular and periodic</u>	Cleaning

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Inspection instructions: PA-03-04, Rev. 1

Component: Outer container			
		<u>inspections:</u> Dirt	
Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
		<u>Maintenance</u> Damaged paint (cracks, flaking) with an extension greater than 1 cm ²	Repair painting
		<u>Regular and periodic inspections</u> Damaged paint (cracks, flaking)	
		<u>Maintenance</u> Signs of corrosion with an extension greater than 1 cm ²	Derust, repair painting
		<u>Regular and periodic Inspections</u> Signs of corrosion	In case of significant material abrasion perform a wall thickness measurement and record in the package log book; If the measured wall thickness is more than 25 % below the requirements of the drawings replace the lid
	Mechanical damages	Holes and cracks, dents with a depth greater 30 mm, sharp edges	Replace lid
	Wall thickness	Wall thickness is below 25 % of the nominal wall thickness	Replace lid
Gasket	Cleanliness	Dirt	Cleaning
	General condition	Damages, cracks	Replace gasket

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Inspection instructions: PA-03-04, Rev. 1

Component: Outer container

Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
Clamping ring	Surface conditions	<u>Maintenance</u> Dirt, if it can impair the function of the package <u>Regular and periodic inspections:</u> Dirt	Cleaning
		<u>Maintenance</u> Signs of corrosion with an extension greater than 1 cm ² <u>Regular and periodic Inspections</u> Signs of corrosion	Replace clamping ring
	Mechanical damages	Holes, cracks, deformations	Replace clamping ring
Clamping ring screw	Surface conditions	Signs of corrosion, which may impair the function	Replace clamping ring screw
	Mechanical damages	Damaged threads and screw heads	Replace clamping ring screw

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Inspection instructions: PA-03-04, Rev. 1

Component: Insulating disk			
Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
Surface	Surface conditions	Dirt	Cleaning
		Signs of corrosion and damages of the surface coating (white discolouration are acceptable)	Derust; in case the function is impaired replace part
	Mechanical damages	Holes and cracks, dents with a depth greater 30 mm, holes, cracks	Replace part

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Component: Inner container			
Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
Inner cavity	Surface conditions	Dirt	Cleaning
		Damaged paint (cracks, flaking)	Repair paint
		Signs of corrosion	Derust, repair painting In case of significant material abrasion perform a wall thickness measurement and record in the package log book; If the measured wall thickness is more than 25 % below the requirements of the drawings the cask has to be separated resp. repair measures have to be agreed with BAM
	Mechanical damages	Holes and cracks, dents with a depth greater 30 mm, sharp edges	Separate cask resp. agree with BAM on repair measures
	Wall thickness	Wall thickness is below 25 % of the nominal wall thickness	Separate cask resp. agree with BAM on repair measures
Sealing surface	Surface conditions	Dirt	Cleaning
		Damage of paint (cracks, flaking)	Repair paint
		Signs of corrosion	Derust, repair coating
	Mechanical damages	Notches, furrows, scratches in the metallic base material larger than 20 mm transversally in relation to the gasket	Separate cask resp. agree with BAM on repair measures
Lid (outer and inner surface)	Surface conditions	Dirt	Cleaning
		Damage of paint (cracks,	Repair paint

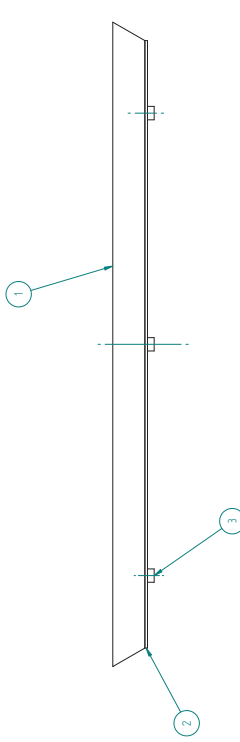
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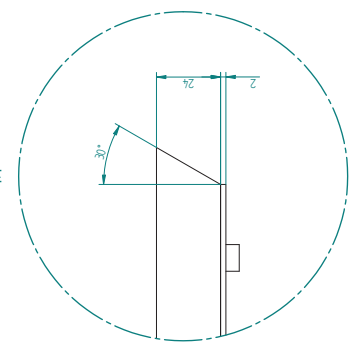
Component: Inner container			
Part	Inspection for:	Unacceptable are:	Measures in case of non-conformities
		flaking)	
		Signs of corrosion	Derust, repair painting In case of significant material abrasion perform a wall thickness measurement and record in the package log book; If the measured wall thickness is more than 10 % below the requirements of the drawings replace the lid
	Mechanical damages	Holes and cracks, dents with a depth greater 5 mm	Replace lid
	Wall thickness	Wall thickness is below 25 % of the nominal wall thickness	Replace lid
Gasket	Cleanliness	Dirt	Cleaning
	General condition	Damages, cracks	Replace gasket
	Fastening to the lid	Damaged fastening	Glue gasket to lid
Screws and thread holes	Surface conditions	Signs of corrosion	Replace screws, Rethread , if the tolerances specified in the higher ranking instructions are exceeded repair with Helicoil insert
	Mechanical damages	Damaged threads and screw heads	Replace screws, Rethread , if the tolerances specified in the higher ranking instructions are exceeded repair with Helicoil insert

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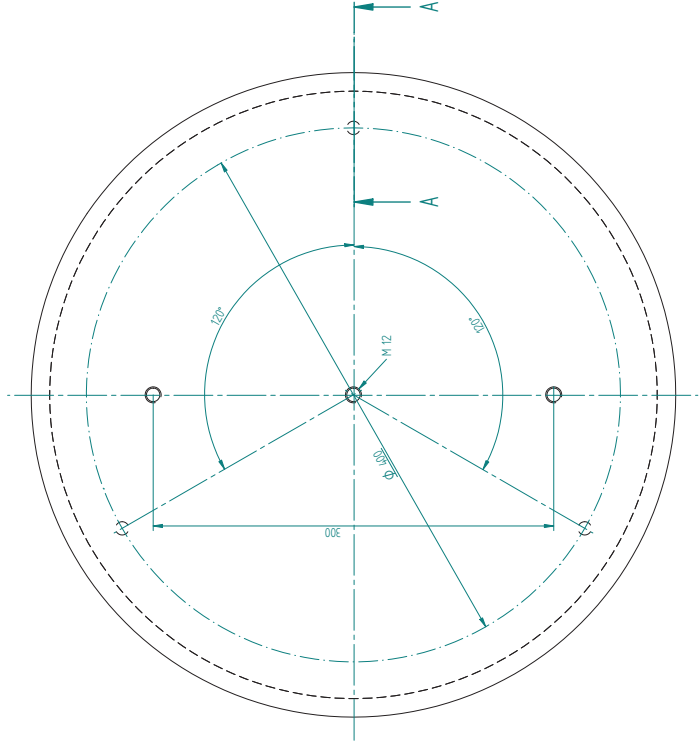
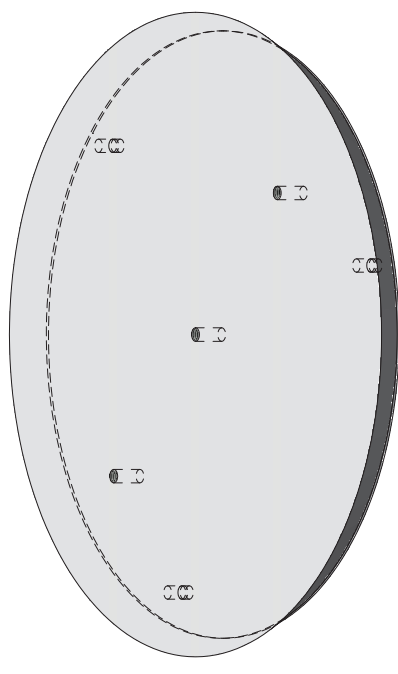
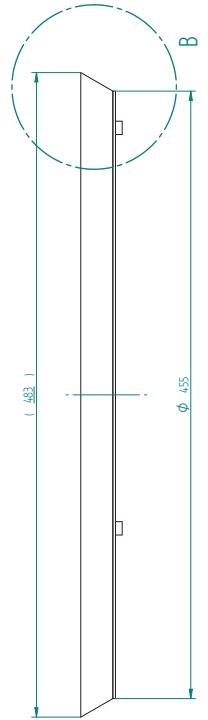
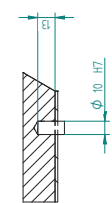
Attachment 2: Sample template for the repair of the light concrete surface



EINZELHEIT B
1:1



SCHNITT A-A



Pos.	Bezeichnung	Stück	Werkstoff	Werkstoff- prüfung	Norm	Abmessung / Zeichnungs-Nr.
1	Formstück	1	Polymid			
2	Gummlaufrolle	1	Gummi			
3	Zylinderstift DIN 7 - 10H7 x 20	3	Stahl			

Abmessungen nach DIN ISO 2768-mS	2008	Datum	Name
Schweißarbeiten nach DIN EN ISO 15614-1			
Form- und Lagerfertigung nach DIN ISO 1101	30.09.		Korn
Umformtechnik nach ISO 10176			30.09.
			Bearbeitern

Material	Prozent / Projekt
Gewerbetriebswesen nach DIN ISO 2768-mS	scale
Surface texture acc. to DIN EN ISO 1302	1:2
Geometrische Formtoleranzen nach DIN ISO 1101	1:1
Copyright acc. to DIN ISO 9004	

Zeichnungs-Nr. / Form-Nr.	
1-270-031-10-00	A1

Form-Nr.	
A1	

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