Annex 2 – Minimum requirements established for the quality plans of the quality assurance program for modification (reconditioning, conversion, routine maintenance, and repair) of packaging (including Intermediate Bulk Containers – IBCs and Large Packaging – LPs).

1 Introduction

The quality of any processed packaging used for the transport of dangerous goods, must correspond to the quality of the construction type as approved for the relevant UN mark.

The reconditioning involves the process of creating a package starting from used packaging, semi-finished products, and auxiliary products.

The minimum required controls are divided into controls on incoming goods, production control and a final control, and are specified for each modifying process in the following applicable tables.

Reference to an undated standard in the tables means the last published version of the relevant standard applies. It is acceptable that a different standard is used if it has been demonstrated that this standard is equivalent to the reference standard.

In this document, "reconditioning" is considered to be the processing of packaging. Packaging that is refilled with the same or analogous compatible goods and that are transported within a distribution chain under the control of the sender are not included under this term but are considered "reuse".

For IBCs, the concepts of "reconditioning" and "reuse" are not known, but the term "routine maintenance" is used. This document distinguishes between routine maintenance, carried out by the owner of the IBC, or on its instructions, and routine maintenance performed by another party. The first situation corresponds to its reuse of packagings and is not part of this document. This document refers to the second situation, in which a mark must be applied by this party.

For reconditioning of plastic packaging and routine maintenance of plastic IBCs (or with plastic inner container) the situation may arise that the packaged substance has been absorbed by the plastic material, which could lead to problems if there are other substances packaged (not only contamination, but also chemical reactions). Furthermore, it must be considered that the plastic may have been damaged by previous use packaged products. The ones that provide reconditioned plastic packaging and plastic IBCs subject to routine maintenance on the market must inform its customers of these aspects and point out their responsibilities.

During the process of routine maintenance and repair of IBCs, an inspection is performed in accordance with the 5-yearly inspection of IBCs.

2. Controls

The controls are performed by comparing the object to be checked with the reference dates that are fixed for the approved construction type. These dates can be found in the approval certificate, test reports, internal company data (e.g. purchase of materials) and in the applicable regulations for the transport of dangerous goods.

If measurements are recorded during the checks, the (average) measured values are compared to the nominal values. In this case the nominal values must be available with tolerances and the measured values must be within these tolerances. The tolerances are specified in the relevant tables. If not, then the following tolerances apply:
±1% for the main dimensions of the package
±3% for other properties

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The necessary written instructions must be available to ensure the correct execution of the control procedures.

3. Entry control

The table indicates which checks must be carried out. Very often certificates and/or other information that is included upon delivery of the raw materials, semi-finished products and auxiliary products can be used.

4. Production control

Before start-up and during the production process, all production installations and equipment must be checked in advance, to ensure they are correctly adjusted.

To this end, the personnel involved in the production and control processes must both have efficient and appropriate instructions available regarding the UN approved construction type as well as the relevant documentation.

The production control includes both the control of the first sample and the inspection during production according to a frequency stated in the tables.

As part of production control, any packaging for liquids (and the IBCs for solid products that are filled or emptied under pressure) is required to be subjected to a leakproofness test. This requirement can be fulfilled using a combination of adapted leakproofness tests and relevant checks of incoming goods, production controls and final controls.

5. Final check
Unless otherwise stated in this document, the indicated tests must be prepared, performed, and evaluated according to the regulations for the transport of dangerous goods and according to the test program of the relevant UN construction type. The minimum quantity of samples to be tested is 1 for each test.
In accordance with 6.1.5.1.10 of the various regulations, multiple tests can be performed on 1 sample provided that the validity of the results is not influenced.
The holder of the certificate is responsible for carrying out all tests described in the tables in this appendix. For all drop tests, the most vulnerable orientation must be chosen for the evaluation.
Re-evaluation in case of failure: If only one package fails only one of the tests (as stated in the tables), then that test will be repeated on twice the normal number of identical packages for that test. If all of these are found to be capable of passing the tests, the packaging will be considered compliant in meeting the test requirements.

6. Traceability

A traceability system must be provided for each packaging used that is able to determine which materials, semi-finished products and auxiliary materials were used, and which checks were carried out on this packaging

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Table 30: Reconditioning of steel drums (1A1) liquids – (1A2) liquids/solids			
Machining process	**Incoming control**	**Production control**	**Final Control**
Reconditioning of steel drums 1A1 1A2	Checking supplied barrels, whether or not after cleaning: • No serious deformation (namely no denting) • No content (residual) • UN marking (complete, and first part permanent in the bottom)[1-2] • Only surface rust (no pitting corrosion) that can be removed during the reconditioning process is permitted. • Welding seam(s) in good condition • Mass or wall thickness Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type	Checking the first sample and checking during the production (each drum, unless specified differently): • Checking of the mechanical seams, rolling hoops, bottom, top and walls (maximum 6 dents with depth and length maximum 6.5 and 75 mm). • Dryness of outer and inner, no rust or residue. • No damage on threads of the openings and closures. • For 1A2, correctness of the mechanical closing of lid by closing ring. • No welds. • Check leakproofness device (once every 8 hours). • Leakproofness of each packaging meant to contain liquids (in combination with other checks where required). • Completeness of the paintjob. • Correctness and readability of the UN marking.	Inspections to be done when production is ongoing (once a year and on minimal 1 sample): • Drop test. • Hydraulic pressure tests[3]. • Leakproofness test[3].
	[1] Drums 1A1: based on the marking to be applied, a pre-selection of the received drums needs to be performed. [2]Drums type 1A2: drums with the same UN marking need to be selected.		[3] only applies to packagings intended for liquids.

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Table 31: Reconditioning of plastic drums and jerricans (1H1 and 3H1)			
Machining process	**Incoming control**	**Production control**	**Final Control**
Reconditioning of plastic drums and jerricans 1H1 3H1	Checking supplied drums and jerricans, whether or not after cleaning: • No serious deformation (namely no denting), damages (like tears) or discoloration. • Knowledge of the last content in combination with cleaning and the maximum lifespan. • Residual product: packaging must be empty (let leak out or scraping) • Complete UN marking. • Year of production. Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type	Checking the first sample and checking during the production (each drum or jerrican, unless specified differently): • Checking of damages or distortions (like tears, surface tears, holes, folds or dents). • Dryness of outer and inner, no residue. • No damage on threads of the openings and closures. • Check leak-proofness device (once every 8 hours). • Leak-proofness of each packaging meant to contain liquids (in combination with other checks where required). • Correctness and readability of the UN-marking.	Inspections to be done when production is ongoing (once a year and on minimal 1 sample): • Drop test. • Hydraulic pressure tests. • Leakproofness tests.

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Table 32: Remanufacturing of steel drums (1A1) liquids to steel drums (1A2) for solids (new lid)			
Machining process	**Incoming control**	**Production control**	**Final Control**
Remanufacturing of steel drums (1A1) liquids to steel drums (1A2) for solids (new lid)	Checking supplied barrels, whether or not after cleaning: • No serious deformation (namely no denting). • No content (residual). • UN marking (complete and first part in permanent in the bottom). Level: at least X1.2 (1.2 or higher) or Y1.9(1.9 or higher). • Year of production: maximum 5 years old. • Thickness of walls and bottom: minimum 0.8 mm. • Only surface rust (no pitting corrosion) that can be removed during the remanufacturing process is permitted. • Welding seam(s) in good condition. • Mass or wall thickness. Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type.	Checking the first sample and checking during the production (each drum, unless specified differently): • Checking of the mechanical seams, rolling hoops, bottom, top and walls (maximum 6 dents with depth and length maximum 6.5 and 75 mm) • Dryness of outer and inner, no rust or residual. • No damage on threads of the openings and closures. • Correctness of the mechanical closing of lid by closing ring. • No welds. • Completeness of the paintjob. • Correctness and readability of the UN marking on the walls and the lid.	Inspections to be done when production is ongoing (once a year and on minimal 1 sample): • Drop test.

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Table 33: Routine maintenance on rigid IBCs			
Machining process	**Incoming control**	**Production control**	**Final Control**
Routine maintenance on rigid IBCs 11H1 11H2 21H1 21H2 31H1 31H2 11HA1 21HA1 31HA1 11HH1 21HH1 31HH1	Checking supplied IBC, whether or not after cleaning: • No serious deformation (namely no denting), damages (tears) or discoloration of the inner bottle. • No serious distortion or damaging of the outer part. • Knowledge of the last content in combination with cleaning and the maximum lifespan. • Residual product: packaging must be empty (complete draining or scraping of residual product). • Complete UN marking. • Year of production. Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type.	Checking the first sample and checking during the production (each IBC, unless specified differently): • No visible damages or deformations (like tears, surface tears, holes, folds, or dents) • Dryness of outer and inner, no residue. • No damage on threads of the openings, closures, valves, or seals. • Proper functioning of the equipment. • Correctness and readability of the UN marking and the serial number. • Check leakproofness device (**once every 8 hours).** • Leakproofness of each IBC type 21 and 31 (in combination with other checks where required).	

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Table 34: Repair of steel IBCs/LPs			
Machining process	**Incoming control**	**Production control**	**Final Control**
Repair of steel IBCs/LPs 11H1 11A 21A 31A 50A	Checking supplied IBC: • No serious deformation or damages on the IBC (inner and outer part) (except for the part to be repaired). • No serious distortion or damaging (like tears or corrosion) of the inner tanks of a metal IBC. • Completeness of UN marking. Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type.	Checking the first sample and checking during the production (each IBC/LP, unless specified differently): • No visible damages or deformations (like tears, surface tears, holes, folds, or dents). • Verification of the repair. • No damage on threads of the openings, closures, valves or seals. • Proper functioning of the equipment. • Correctness and readability of the UN marking and the serial number. • Check leakproofness device (**once every 8 hours**). • Leakproofness of each IBC type 21 and 31 (in combination with other checks where required).	

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Table 35: Repair of combination IBCs (replacement of the inner bottle).			
Machining process	**Incoming control**	**Production control**	**Final Control**
Repair of combination IBCs (replacement of the inner bottle). 11HA1 21HA1 31HA1 11HH1 21HH1 31HH1	Checking supplied IBC: • No serious deformation or damages on the IBC outer part. • Completeness of UN marking. Semi-fabricates and auxiliary products: • Check of conformity with the suppliers specifications at each delivery and the conformity with the construction type. • Check on conformity with the prototype of the replacement inner bottle.	Checking the first sample and checking during the production (each IBC/, unless specified differently): • No visible damages or deformations (like tears, surface tears, holes, folds, or dents) • Dryness of outer and inner, no residue. • No damage on threads of the openings, closures, valves or seals. • Proper functioning of the equipment's. • Correctness and readability of the UN marking and the serial number. • Check leakproofness device (**once every 8 hours**). • Leakproofness of each IBC type 21 and 31 (in combination with other checks where required).	