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03.04.2014

CJSC "New Technology in Transportation"
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Russia

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INTERNATIONAL
DANGEROUS GOODS & CONTAINERS ASSOCIATION
General Director Mikhail Ognev
business-center "Resurs", office: 431

35A, Marshal Govorov str.
198095 St. Petersburg
Russia

FBC UN-Tests – Top-Lift Tests

Our Visit and Observation of FBC-Top-Lift Test

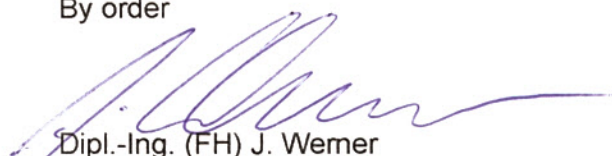
Dear Mr. Akhundov, dear Mr. Ognev,

Enclosed you will find our observation report of the Top-Lift Test at Krylov State Research Center.

You will receive the invoice by different letter.

If you have any further questions please do not hesitate to contact us.

Best regards
By order



Dipl.-Ing. (FH) J. Werner
Technischer Regierungsamtmann

Observation Report

1 Summary

A „Top Lift Test“ according to the Recommendations on the Transport of Dangerous Goods (UN Model Regulations) 6.8.5.3.6. on a Flexible Bulk Container (FBC) was observed at Krylov State Research Center, Moskovskoye Shosse 44 in St. Petersburg (RU) by an independent expert of the Federal Institute for Materials Research and -Testing (BAM) . Two objective loads were tested. Case 1 (84.000 kg) passed the test obviously, case 2 (118.000 kg) could not be completed due to premature failure of the containers bottom.

2 Origination

Background of the attendance by the BAM was the wish of the International Dangerous Goods Container Association (IDGCA) of a neutral observation as well as documentation of the test.

This Observation Report should confirm the correct performance of the test.

It can be added to the Test Report AR-107-P as of 18th march 2014 and given to the members of the RID/ADR/AND Joint Meeting as well as to the members of RID-Committee of Experts, WP.15 and ADN Safety Committee.

3 Observation

The observation occurred in the Krylov State Research Center.

A photo-documentation was not possible because it was prohibited to take own pictures of the test. Only the pictures taken by the IDGCA itself are available. It is not possible to give a statement of the authenticity of those pictures.

3.1 General

All values are seen as correct but could not be verified.

The values are all extracted from the „Test report No. AR-107-P Certification tests for structural type and safety of soft specialized container of MK-14-10 grade“, respectively were taken from the readouts of the measurement instruments.

3.2 Test Setup

The test setup was made as shown in 3.2.4.

3.2.1 Hydraulic system/measurement of forces

To reach the postulated load (case 1: 84.000 kg, case 2: 118.000 kg) four hydro cylinders were applied. They were mounted between a cross-piece bracket arm and a pressure disk. The force of one of them was recorded.

Also the four paths of the hydro cylinders were recorded by computers.

3.2.2 Preload (Grit)

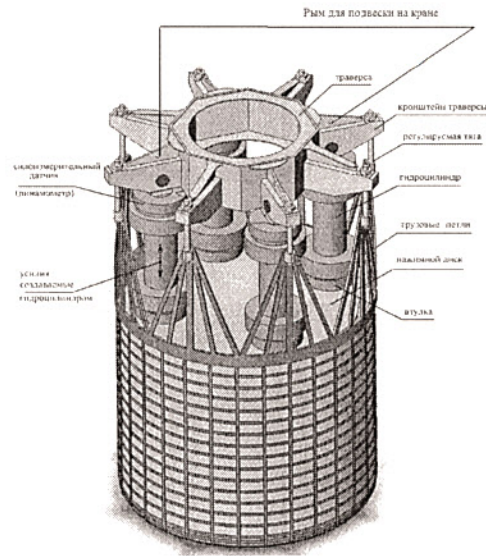
Under the present test report AR-107-P the FBC was preloaded with 18.750 kg of Grit.

3.2.3 Specimen

The specimen (FBC) was fixed with all eight straps to the cross-piece bracket arm. As mentioned in the Test Report AR-107-P as of 18th march 2014 the FBC had the following parameters:

Material	Rubbered cloth reinforced with grid of belt bands
Maximum carrying capacity, kg (Q_{max})	14,000
Maximum holding capacity, m ³	15.0
Top structure	Closed with loading arm
Bottom structure	Flat blind with discharging arm
Lifting device (quantity of lifting eyes)	8
Presence of insert	No
Total quantity of layers when piling	4
Overall dimensions, cm	240×240×280
Package group	III
Registration number	11213691

3.2.4 Picture of test setup



3.3 Test Performance

3.3.1 Objective Load

- a) Case 1: 84.000 kg
- b) Case 2: 118.000 kg

3.3.2 Load Regime

The forces/loads were mustered as shown in table 1:

Table 1 (Load Regime):

No.	Cylinder load P_{cl} (tf)	Sling load P_s (tf)	Rod travel; 1 st cyl. (mm)	Rod travel; 2 nd cyl. (mm)	Rod travel; 3 rd cyl. (mm)	Rod travel; 4 th cyl. (mm)	Average travel (mm)	Notes
1	0	18.75	0.1	0.1	0.1	0.1	0.1	
2	2.72	29.63	16.1	18.3	17.9	16.4	24.58	
3	5.44	40.51	64.9	73.0	73.9	66.5	69.57	
4	8.16	51.39	131.6	145.2	145.0	129.5	137.8	
5	10.88	62.27	196.4	214.1	211.7	192.2	203.6	
6	13.6	73.15	257.8	278.2	275.1	252.8	265.97	
7	16.32	84.0	314.2	337.6	330.4	307.2	322.4	Holding for 5 minutes
8	16.32	84.0	335	359	352	328	343.5	
9	17.06	87.0						Failure of bottom ring framework without container loss

The FBC was detached from the floor at any time of the test.

3.4 Result

Case 1 (84.000 kg) was passed by the specimen and was held for five minutes.

Case 2 (118.000 kg) was not conducted because of ring framework failure under sling load 87.000 kg.

3.5 Interpretation/Comment

The FBC-straps could not be tested (for load case 2) finally because of failure of ring framework. But the test carried out can only be seen as a fictive loading condition. In real lifting the bottom structure would never have been stressed higher than the straps.

Those 118.000 kg demanded, results only out of the safety factor of 1.4 coming from the angle of 45° (demanded worst case for lifting without traverse).

The bottom structure would never be stressed (in testing) with more than 84.000 kg.

Under reservation of the correct adjustment of all values and parameters we hereby confirm the performance of the test in compliance with the Recommendations on the Transport of Dangerous Goods (UN Model Regulations) 6.8.5.3.6.

Berlin, 03.April 2014

On behalf of



Dipl.-Ing. (FH) J. Werner

Division 3.2

Tanks for Dangerous Goods and Accident Mechanics

Federal Institute for Materials Research and Testing (BAM)