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EC type-examination certificate

Certificate no.:	APV 051
Notified body:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany
Applicant/ Certificate holder:	Otis Elevator Korea/SIGMA Elevator Company 74, Seongsan-dong, Changwon City Gyeongnam 641-714 - Southkorea
Date of application:	2010-08-27
Manufacturer of the test sample:	Hebei Dongfang Fuda Machinery Factory No. 112, Guangming East Avenue, Langfang City Hebei Province 065000 - P.R. China
Product:	Hydraulic buffer (Energy dissipating buffer)
Type:	YH73A/210 (DAA22550A3)
Test laboratory:	TÜV SÜD Industrie Service GmbH Prüflaboratorium für Produkte der Fördertechnik Prüfbereich Aufzüge und Sicherheitsbauteile Westendstr. 199 80686 München - Germany
Date and number of the test report:	2010-09-06 APV 051
EC-Directive:	95 / 16 / EC
Result:	The safety component conforms to the essential safety requirements of the Directive for the respective scope of application stated on page 1 of the annex to this EC type-examination certificate.
Date of issue:	2010-09-10

Certification body for lifts and safety components
Identification number: 0036

C. Rüchmeyer
Christian Rüchmeyer





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Annex to the EC type-examination certificate no. APV 051 dated 2010-09-10

1. Scope of Application

- 1.1 Permissible total mass of empty car and rated load
respectively counterweight in using one buffer 700 – 3000 kg

If more buffers (of the same type) are used, the permissible masses
are to multiply accordingly.

- 1.2 Permissible maximum impact speed 2.01 m/s

- 1.3 Properties of the fluid to be used

Oil type: Hydraulic fluid according to ISO VG 68 or equivalent

2. Conditions

- 2.1 The lift may only be operated if the buffer is in ready position. The ready position must be monitored
by an electrical safety device.
- 2.2 The fluid level must be easy to check (e.g. by oil dipper stick).

3. Remarks

- 3.1 In order to provide identification and information about the basic design and its functioning, drawing
no. DAA22550A of 2009-05-05 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010" is to be en-
closed with the EC type-examination certificate and the annex thereto. The mounting and installation
conditions are presented in separate documents.
- 3.2 The EC type-examination certificate may only be used in connection with the pertinent annex.



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Test Record to the test report no. APV 051

Choose certainty.
Add value.

Applicant/Certificate holder: Otis Elevator Korea/SIGMA Elevator Company
74, Seongsan-dong,
Changwon City, Gyeongnam, 641-714, Southkorea

Manufacturer: Hebei Dongfang Fuda Machinery Factory
No. 112, Guangming East Avenue,
Langfang City, Hebei Province 065000, P.R. China

Test object: Hydraulic buffer (Energy dissipation buffer)

Type: YH73A/210 (DAA22550A3)

Place of examination: Changwon (Southkorea), laboratory of Otis/Sigma

Date of examination: 2010-08-27

Participants: - Mr. Byoung-Jin Jang (Otis)
- Mr. Sung-Tae Kim (TÜV SÜD Korea)
- Mr. Peter Tkalec (TÜV SÜD Industrie Service GmbH)

Used measurement tools: - Device for measuring Masses
- Device for measuring temperatures
- EVA-System for measuring deceleration and speed
- Watch
- Tape measure

Date: 2010-08-27

Our reference:
IS-FT-MUC/tk
Document:
PP_APV_051_2010_08_27_en

This document consists of
2 Pages.
Page 1 of 2

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TÜV SÜD Industrie Service GmbH.

The test results refer exclusively
to the units under test.

1. Scope of examination according to EN 81-1:1998+A3:2009 (E), F.5.3.2

1.1 Test procedure

The buffer was tested with the aid of weights, corresponding to the minimum and maximum masses, falling in free fall to reach at the moment of impact the maximum speed called for.

Speed, acceleration and retardation are recorded as a function of time throughout the movement of the weights.

After each test the buffer was held in the completely compressed position for 5 minutes. After lifting the weights the buffer reaches the position of complete return in less than 120 seconds.

The next test was carried out with a delay of more than 30 minutes.





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2. Measured Values

- 2.1 The oil temperature was 24.3°
- 2.2 Total mass of car and rated load, impact speed and retardation

Total mass of car and rated load (kg)	Free fall distance (mm)	Impact speed (m/s)	Average retardation (m/s ²)
3000	240	2.06	9.67
700	240	1.99	3.276

- 2.3 No retardation of more than 2.5 g and longer than 0.04 s did appear.
- 2.4 After the tests no permanent deformation of the buffer could be stated.

3. Result

The required test procedures according EN 81-1:1998+A3:2009 (E), F.5.3.2 have been carried out. All the tests have shown compliance with the requirements of the standard.

TÜV Industrie Service GmbH
Geschäftsfeld Fördertechnik
Expert engineer

A handwritten signature in blue ink, appearing to read 'P. Tkalec'.

Peter Tkalec



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Test report no. APV 051

Choose certainty.
Add value.

Applicant / Certificate holder: Otis Elevator Korea/SIGMA Elevator Company
74, Seongsan-dong,
Changwon City, Gyeongnam, 641-714, South-
korea

Manufacturer: Hebei Dongfang Fuda Machinery Factory
No. 112, Guangming East Avenue,
Langfang City, Hebei Province 065000, P.R.
China

Date of application: 2010-08-27

Test laboratory: TÜV SÜD Industrie Service GmbH
Zentralbereich Fördertechnik-Sonderbauten
Abteilung Aufzüge und Sicherheitsbauteile
Westendstraße 199
80686 Munich - Germany

Date: 2010-09-06

Our reference:
IS-FI-MUC/tk
Document:
PB_APV_051_2010_09_06_en.d
ocx

Product: Hydraulic buffer (Energy dissipating buffer)

Type: YH73A/210 (DAA22550A3)

This document consists of
4 Pages.
Page 1 of 4

Scope of application: Performance of an EC type-examination of a
safety component, listed in annex IV, according
to annex V/A of the directive 95/16/EC

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Specifications: - Directive 95/16/EC of 29th of June 1995,
Annex I
- Standard EN 81-1:1998+A3:2009 (D)

The test results refer exclusively
to the units under test.

Kind of examination - Examination on correspondence with the
specifications
- Function tests

Place and date of examination Changwon (laboratory of Otis), 2010-08-27





1 Description of the test object

Hydraulic buffer with spring return existing of a mounting plate, cylinder, plunger and top plate with rubber. The safety switch is mounted on the cylinder and engaged by a guided switch rod.

2 Documents on which this test report is based

- Approval drawing no. DAA22550A of 2009-05-05, sheet 2 of 3 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
- Drawing no. DAA22550A of 2009-05-05, sheet 1 and 3 of 3 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
- Documents of Hebei Dongfang Fuda:
 - Drawing no. YH73A/210 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
 - Drawing no. YH73A /210-2 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
 - Drawing no. YH73A /210.1 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
 - Drawing no. YH73A /210.2 stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
 - Installation, use and maintenance manual for oil buffer YH71A-YH75A of 6/12/2009 (9 pages) stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
- 2 diagrams stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
- buffer type-test result stamped with "TÜV SÜD 0036" dated "06. Sep. 2010"
- Pictures DSC_0111-DSC_0119; DSC_0121 on 3 pages
- Test record PP_APV_051_2010_08_27_en dated 2010-08-27
- Application of 2010-08-27

3 Test procedure

3.1 The used test procedure is described in EN 81-1:1998 + A3:2009 (D), Annex F.5.3.2

3.2 Examinations in detail

- 3.2.1 Checking the documents
- 3.2.2 Comparison of the test object with the drawings
- 3.2.3 Checking of mounting the buffer
- 3.2.4 Measuring of oil temperature and filling
- 3.2.5 Free fall tests
- 3.2.6 Measuring the time of the completely pressed buffer
- 3.2.7 Measuring the time of return into the starting position
- 3.2.8 Checking of liquid losses
- 3.2.9 Checking of the condition of the buffer after tests

4 Remarks to the examination

4.1 Place of examination

Laboratory of Otis Elevator Korea
74, Seonsang-dong
Changwon City, Gyeongnam, 641-714, Southkorea

4.2 Date of examination

27.08.2010

4.3 Participants

- Mr. Byoung-Jin Jang (Otis)
- Mr. Sung-Tae Kim (TÜV SÜD Korea)
- Mr. Peter Tkalec (TÜV SÜD Industrie Service GmbH)

4.4 Used measurement tools

- Device for measuring masses
CAS, pictures DSC_0111, DSC_0114, DSC_0115, DSC_0121, (calibration valid until 2011-05-02)
- Device for measuring temperatures
Thermometer FLUKE 52II, pictures DSC_0112 and DSC_0113, (calibration valid 2011-05-10)
- EVA-System for measuring deceleration and speed
EVA-625, serial no. E99033475, pictures DSC_0118 and DSC_0119 (calibrated until 17. FEB. 2011)
- Caliper (mentioned in calibration list)
- Stop-watch
- Tape measure

5 Findings

5.1 Checking the documents:

The submitted documents are complete and correct. They meet generally the requirements of the specifications.

5.2 Comparison of the test object with the drawings:

The buffer corresponds to the documents.

5.3 Checking of mounting the buffer:

The buffer was placed and fixed in the same manner as in normal service.

5.4 Measuring of oil temperature and filling:

The buffer was filled to the maximum with oil of quality according to ISO VG 68, the measured temperature was 24.3°

5.5 Free fall tests:

The free fall tests have been carried out with minimum and maximum masses representing mass of empty car and rated load. Following values have been measured:

Total mass of car and rated load (kg)	Free fall distance (mm)	Impact speed (m/s)	Average retardation (m/s ²)
3000	240	2.06	9.67
700	240	1.99	3.28



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- 5.6 Measuring the time of the completely pressed buffer:
After each test the buffer was held in the completely pressed position for 5 minutes.
- 5.7 Measuring the time of return into the starting position:
After each test the buffer reaches the position of complete return in less than 120 s.
- 5.8 Checking of liquid losses:
After each test the filling was measured. There were not more losses than to the minimum mark.
- 5.9 Checking of the condition of the buffer after tests:
After the tests no permanent deformation or damage could be stated.

6 Test result

The buffer fulfils the requirements of the standard.

7 Common remarks

This test report is based on the state of technology, documented by the at present valid harmonized standards. In case of modifications or amendments of these standards respectively the development of the state of technology reworking could be possible.

Prüflaboratorium für Produkte der Fördertechnik
Prüfbereich Aufzüge und Sicherheitsbauteile

A blue ink signature of Klaus Lederle.

Klaus Lederle

Geschäftsfeld Fördertechnik
The expert engineer

A blue ink signature of Peter Tkalec.

Peter Tkalec