Industrie Service

Choose certainty.
Add value.

Test Report Flood Protection Systems

Copy

Client	Blobel Umwelttechnik GmbH Ziegeleistr. 5 D-86368 Gersthofen
Order date	115 0163-80 / 235 1916
Project no.	501 018 8052
Scope of order	Involvement with the testing of mobile flood protection systems in accordance with the quality and testing conditions of the Europaverband Hochwasserschutz e.V. (European Flood Protection Association)
Specimen under test	Description: **Floodwater protection system** Evaluation group: **O 3 / Building protection Closure, sealing on 4 sides** Test number: **EVH014/BLOBEL/O3/02-15** System des.: **TYPE BL 336 HHS** Clear shell opening: 1.0 / 1.0 m Damming height: 1.1 m
Test result (in accordance with test conditions status November 2014)	Volume: - m³/m² **-** Weight: - kg/m² **-** Set-up time: 0.23 min./m² **Class 0** Leak-proofness: 0.02 litres/min/m² **Class 1**
Author	Dipl. - Ing. Univ. M. Beike
Appendices	20 pages
On-site visit	27.04.2015
Report completion	22/07/2015
View of test bench:	

Date: 07.10.2016

Reference:
IS-BT-MUC/Bm

The document comprises 20 pages.

The test results refer exclusively to the test specimens examined.

Certified System swissTS ISO 9001

Headquarters: Munich
Trade Register Munich HRB 96 869
VAT ID No. DE129484218
Information pursuant to Section 2(1) DL-InfoV (Germany) at
www.tuev-sued.com/imprint

Supervisory Board:
Karsten Xander (Chairman)
Board of Management:
Ferdinand Neuwieser (CEO),
Dr. Ulrich Klotz, Thomas Kainz

Phone: +49 89 5791-2534
Fax: +49 89 5791-2513
www.tuev-sued.de/is

TÜV SÜD Industrie Service GmbH
Civil Engineering International
Westendstraße 199
80686 Munich
Germany

Industrie Service

Copy
The signed original is the only legally binding version

TABLE OF CONTENTS

1 Background, reason for report 3

2 Data 3

2.1 Written data 3
2.2 Documents used 4

3 Measures 4

4 Basis for the test 5

4.1 Scope 5
4.2 General conditions 6
4.3 Description of the evaluation group 7
4.4 Test criteria and evaluation classes 8
4.4.1 Storage and transport volume 8
4.4.2 Set-up times 8
4.4.3 Leak-proofness 9
4.4.4 Structural analysis 9
4.4.5 Manufacturer's expertise 9
4.4.6 Documentation 10

5 Specimen under test / product description 11

6 Measurements and classification of the product 15

6.1 Test set-up / general conditions 15
6.2 Implementation of the test 16
6.3 Measured values / classification 18

7 Test result 20

Copy
The signed original is the only legally binding version

1 Background, reason for report

Blobel Umwelttechnik GmbH, Ziegeleistr. 5, D-86368 Gersthofen commissioned testing of the floodwater protection system type "BL 364 HDS 150x100" for "building protection closure O3, on four sides" in accordance with the "Güte- und Prüfbestimmungen zur Erlangung und Verleihung der Gütezeichen zum technischen Hochwasserschutz" ("Quality and testing conditions for achieving and awarding the quality mark for technical floodwater protection") from the European Floodwater Protection Association (referred to as EVH below), version November 2014.

The test is carried out by the Chairman of the Quality Committee, Prof. Sänger, as well as the independent expert, Mr. Kalczyk, as Deputy, as well as a representative of EVH if appropriate. In order to guarantee independence, EVH and Blobel Umwelttechnik GmbH request the participation of a building expert from TÜV SÜD in these tests and a separate expert report documenting the test and its results. Blobel Umwelttechnik GmbH commissioned TÜV SÜD Industrie Service GmbH, Civil Engineering International, Munich, with this in writing on 13.03.2015.

2 Data

2.1 Written data

TÜV SÜD has the following documents available for the product (attached):

[S1] Informal application letter dated 09.04.2015

[S2] Signed notice of commitment dated 27.04.2015

[S3] System description dated 17.04.2015

[S4] Operating manual dated 17.04.2015

[S5] Design drawing dated 21.04.2015

[S6] Detailed drawings dated 21.04.2015

[S7] Cleaning instructions dated 17.04.2015

[S8] Data sheets for the materials used dated 27.04.2015

[S9] Manufacturer's expertise: Third party liability insurance. Unlimited validity period

[S10] Manufacturer's expertise: Quality assurance system valid until 04.01.206

The structural proofs and system structural analysis must be presented and documented to the test committee by 27.05.2016 at the latest.

2.2 Documents used

[U1] "Güte- und Prüfbestimmungen zur Erlangung und Verleihung der Gütezeichen zum technischen Hochwasserschutz" ("Quality and testing conditions for achievement and awarding of the quality mark for technical floodwater protection"); European Floodwater Protection Association, version November 2014

3 Measures

An on-site visit was paid to the factory workshop of Blobel Umwelttechnik GmbH, Ziegelleistr. 5, D-86368 Gersthofen, between 9.20 a.m. and 6 p.m. on 27.04.2015.

The following persons were present during this visit:

- Mr. Sänger, EVH Quality Committee (Chairman), non-member EVH
- Mr. Kalczyk, EVH Quality Committee (Deputy Chairman), non-member EVH
- Mr. Prestel, Company representative for Blobel, member EVH
- Ms. Blobel, Managing Director of Blobel, member EVH
- Mr. Beike, Expert from TÜV SÜD, non-member EVH

The test bench was set up in the factory workshop for the on-site visit.

Measuring instruments used:

Folding rule with mm scale	yes
Spirit level L = 1.50 m	yes
Stopwatch	yes
Collection vessels, measuring beakers	yes
Folding rule with mm scale	yes
Decimal scales	no

The results of the investigations are summarised and evaluated in the expert report.

The test report was completed on 22/07/2015.

4 Basis for the test

4.1 Scope

The EVH quality and testing conditions apply for the manufacture, delivery and initial assembly of mobile floodwater protection systems.

For the purpose of the test criteria, a distinction is made between mobile floodwater protection systems as follows:

Evaluation groups:	Disaster control =	Test mark	K
	Building protection =	Test mark	O
	Agricultural protection =	Test mark	L

Evaluation in accordance with the quality and testing conditions is exclusively for purposes of comparison between the systems tested.

The test concept was prepared on the basis of the quality and testing conditions for achievement and awarding of the "Quality mark" for technical floodwater protection from EVH.

Changes which refer to these test criteria must be reported. In addition, the manufacturer must verify after 3 years that the test result still complies with the test criteria of the initial application. The Quality Committee of EVH retains the right to check this data.

4.2 General conditions

Standards and regulations

Generally accepted engineering rules in accordance with the relevant standards apply for the manufacturing of mobile floodwater protection systems. Any pertinent EN standards also apply.

Testing and monitoring authorisation

Evaluations and tests are carried out by the Quality Committee of the EVH in compliance with §9 of the association's statute. The practical tests are carried out by the applicant on test systems assigned by the Quality Committee and under its supervision.

Confidentiality agreement

The following confidentiality obligation was submitted by the participants in the test:

These documents contain product-related company and business secrets which require special protection and are thus subject to strict confidentiality. Their unauthorised use is penalised in accordance with § 203 of the German Criminal Code and § 17 of the German law against unfair competition.
For this reason, the members of the Quality Committee are committed to absolute confidentiality and secrecy through separate written declarations of obligation reinforced by contractual penalty, which are to be filed with the Association Board. Violations will be relentlessly pursued.

4.3 Description of the evaluation group

Evaluation group – Building protection – O

Definition: Planned, fixed and mobile systems for the protection of defined openings in buildings for the duration of flooding or fixed installation.

The test is carried out at the defined openings with smooth surfaces.

e.g. floodwater barrier systems, panel systems, window and door/gate systems, pipeline plugs, automatic and self-erecting systems etc.

Test sample sizes:

Closure	O1	Width 3 metres Height 1 metre damming height

For this usage test, the test sample size usually applicable for agricultural protection was used:

Closure	O1	Width 5.60 metres l Height 1 metre damming height from the top edge of the base structure

With at least one central support, two non-recessed wall connections without cover and one floor-level substructure.

Closure		
Sealing on three sides	O2	Width 1 metre Height 1 metre damming height
Sealing on four sides	O2	Width 1 metre Height 1 metre complete filling 0.10 metres overfilling 1 metre damming height above the base
Pipeline plugs	O4	

4.4 Test criteria and evaluation classes

4.4.1 Storage and transport volume

Measuring parameter: m³ storage requirements per m² floodwater protection system

Class 0: no additional storage requirements (permanently installed systems)
Class 1: 0.01 – 0.2 m³ per m²
Class 2: 0.21 – 0.5 m³ per m²
Class 3: >0.5 m³ pro m²

Comment: Classification according to November 2014 status

4.4.2 Set-up times

Without logistics and lifting gear, in accordance with 3.4.1

With max. 4 workers for **L** and 2 workers for **O**

Distance of 10 m between storage of the system parts and the test box

Class 0:	<1	min. per m²
Class 1:	1-2	min. per m²
Class 2:	2-5	min. per m²
Class 3:	5-15	min. per m²
Class 4:	>15	min. per m²

Comment: Classification according to November 2014 status

4.4.3 Leak-proofness

Slow filling – at least 1 hour constant water level/clear water.

Leak test at at least 1 m damming height in relation to square metres of floodwater protection system.

Three measurements à 2 minutes at intervals of 15 minutes.

Class 0:		zero leaks
Class 1:	<0.2	litres per minute and m²
Class 2:	0.2 to 0.5	litres per minute and m²
Class 1:	0.5 to 1.0	litres per minute and m²
Class 1:	1.0 to 2.0	litres per minute and m²
Class 1:	>2.0	litres per minute and m²

Comment: Classification according to November 2014 status

4.4.4 Structural analysis

The applicant must present a structural analysis for the protection system submitted for inspection which takes the general conditions in accordance with the respective test sample size into account.

For the quality mark to be awarded, the structural analysis presented by the applicant is only checked for **existence** and cannot generally be transferred to building structural analysis and the values these require.

The European Floodwater Protection Association and TÜV SÜD accept no liability for planning accuracy and observance of structural analysis or for functional safety in the application case.

4.4.5 Manufacturer's expertise

Together with the application documents, the applicant must prove the existence of adequate third party insurance and quality assurance measures.

4.4.6 Documentation

In order to be awarded the test mark, the applicant must present the Quality Committee with suitable documentation for the evaluation group applied for, with the minimum scope listed in the documentation.

- Informal application for test or awarding of the quality mark
- Signed notice of commitment
- Complete and comprehensible description of the system as well as operating instructions
- Design drawings
- Detailed drawings
- Storage and maintenance instructions
- Cleaning instructions
- Data sheets for the materials used
- Structural verification
- Third party liability insurance
- Quality assurance

Industrie Service

Copy
The signed original is the only legally binding version

5 Specimen under test / product description

Description: **TYPE BL 336 HHS**

Evaluation group: **O3 / building protection closure, sealing on four sides**

Dimensions:

Aluminium panel: 1,150 x 1,075 x 68 mm

Number of mobile parts: No mobile parts

Constructed system height: 1,100 mm

Dimensions of the opening: 1,000 x 1,000 m

The design of the floodwater protection system is illustrated by the following photos and figures.

Fig. 5-1: Measuring equipment, closed

Fig. 5-2: Measuring equipment, opened

Industrie Service

Copy
The signed original is the only legally binding version

Fig. 5-3: Aluminium rail for extending the measuring equipment and setting up the top, fourth sealing edge

Fig. 5-4: Bolt mechanism and attachment screws on the protective door

Fig. 5-5: Protective door, bottom

Fig. 5-6: Attachment of the measuring equipment with seal at the side

Reference, date, project number : **IS-BT1-MUC/Bm, 22/07/2015, 115 0163-10 / 235 1916**
Order: **Testing of mobile floodwater protection systems**
Object: **Floodwater barrier system for agricultural protection (TYPE BL 361 HDS 150x80)**
Client: **Blobel Umwelttechnik GmbH, Ziegeleistr. 5, D-86368 Gesthofen**

Industrie Service

Copy
The signed original is the only legally binding version

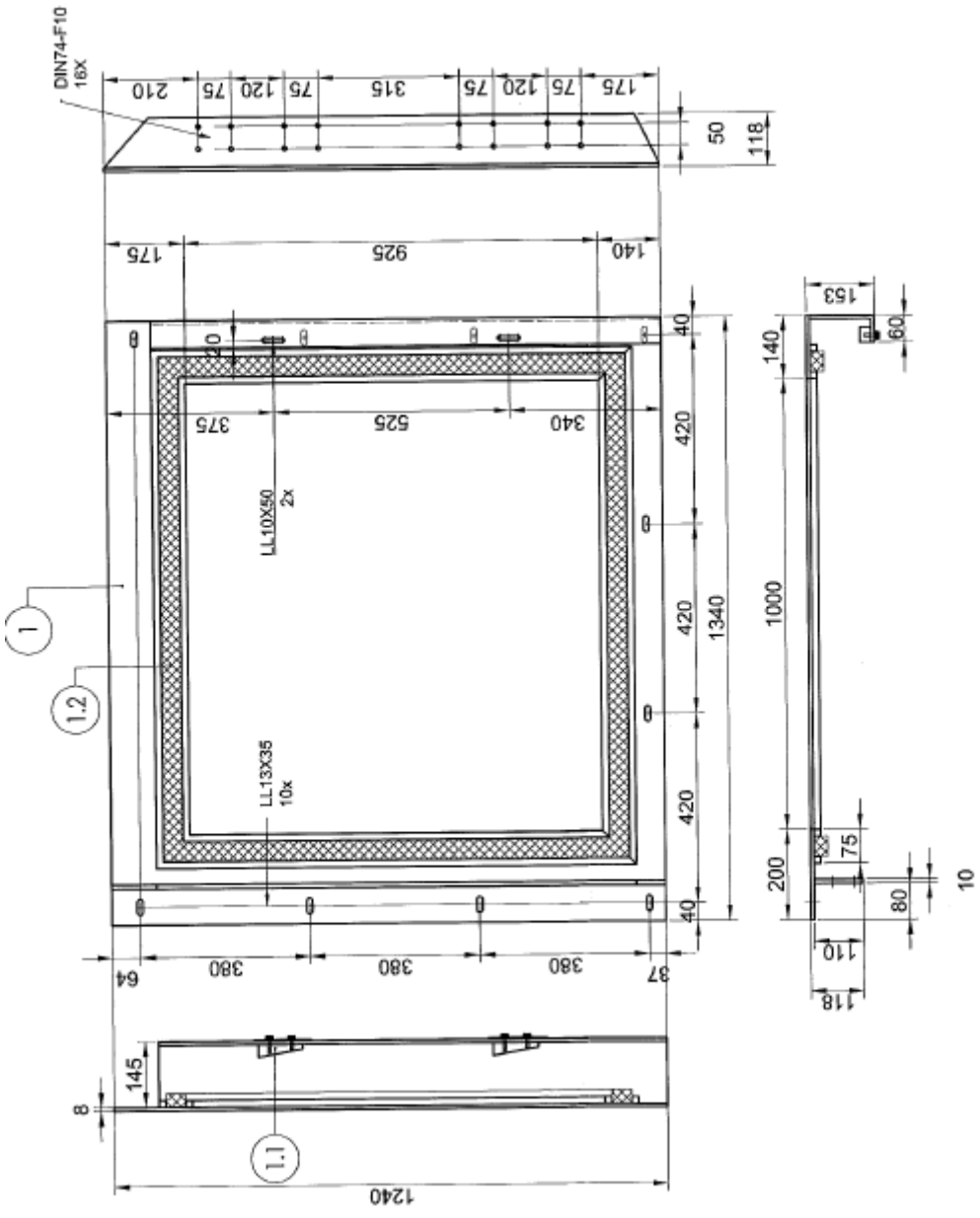

Fig. 5–1: Illustration of measuring equipment

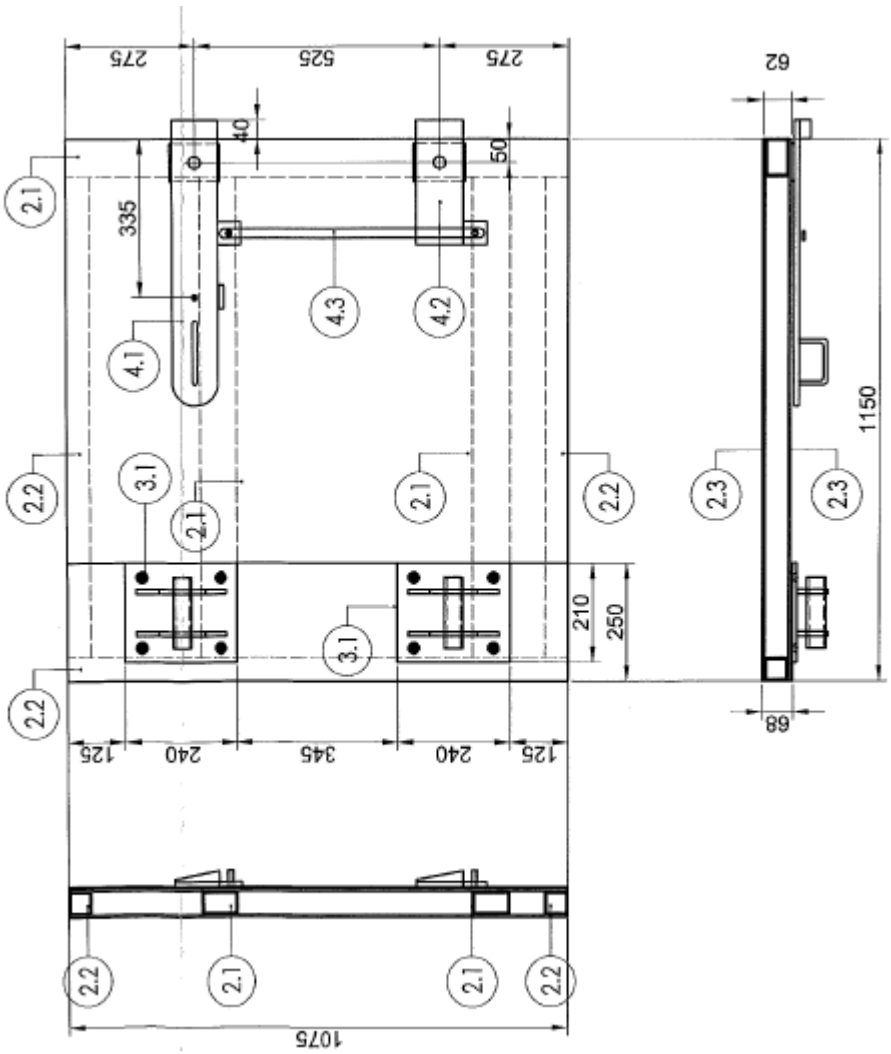

Fig. 5-2: Illustration of measuring equipment

6 Measurements and classification of the product

6.1 Test set-up / general conditions

The test box was set up correctly in a factory workshop. The non-mobile parts of the system (guide rails at the side) were already fitted.

Test box after installation of the floodwater protection system in opened state

Test box after installation of the floodwater protection system in closed state

Fig. 6.1-1: View of the test box with and without floodwater protection system

6.2 Implementation of the test

Test procedure:

Check on the conformity of the design according to the application documents with those of the test.

Set-up of the floodwater protection system in the test box:

27.04.2015, 11.30 a.m.:
- Measurement of the set-up time
- Photo of the structure

Filling of the test box with the floodwater protection system:

27.04.2015, 12.45 p.m.:
- Damming height is reached and permanent application of min. 1.1 m water column

Leak test under constant water pressure:

27.04.2015, from 1.45 p.m.:
- Inspection of the test bench
- Inspection of the water level
- Refilling with water if nec.
- Inspection of the general conditions
- Measurement of leaked amount

The reservoir did not have to be refilled

The set-up of the floodwater protection system is illustrated by the following photos.

Comments:

- To guarantee that the windows were wet from all sides, a rail was attached above the aluminium panel.

Industrie Service

Copy
The signed original is the only legally binding version

Fig. 6.2-1: Protective door

Fig. 6.2-2: Protective door, closed

6.3 Measured values / classification

Examination of the documents revealed that the structural proofs and system structural analysis still have to be provided.

The following table documents and evaluates the measured values and the resulting classes.

Water levels and water leakage spots are documented on the following photos.

Reference area:			
Length:	Width:	**Reference area:**	
1,00 m	1,00 m	**1,00 m2**	

Storage and transport volume:							
Quantity:	Length:	Width:	Height:	Total	**Volume:**	**Reference volume:**	**Class:**
1	no mobile parts						-

Set-up times:					
Set-up time:		exist. and meas. distance storage area - test box:		**Reference time:**	**Class:**
14 sec.	0,23 min.	-	> 10,00 m	**0,23 min./m2**	**Class 0**

Leak-proofness:							
Amount leaked:				exist. and meas. water level:		**Reference leak:**	**Class:**
1st measurement:	from 1:45 PM	30,00 ml/2 min.		1,11 m	> 1,00 m		
2nd measurement:	from 2:00 PM	30,00 ml/2 min.		1,11 m	> 1,00 m		
3rd measurement:	from 2:15 PM	30,00 ml/2 min.	30,00 ml/2 min.	1,11 m	> 1,00 m	**0,015 l/m2/min.**	**Class 1**

Industrie Service

Copy
The signed original is the only legally binding version

Fig. 6.3-1: Flooding or water level at the start of measurement

Fig. 6.3-2: Water leakage

Fig. 6.3-3: Little water leakage on the hinge side, forms a small trickle

Fig. 6.3-4: Little water leakage on the bolt side

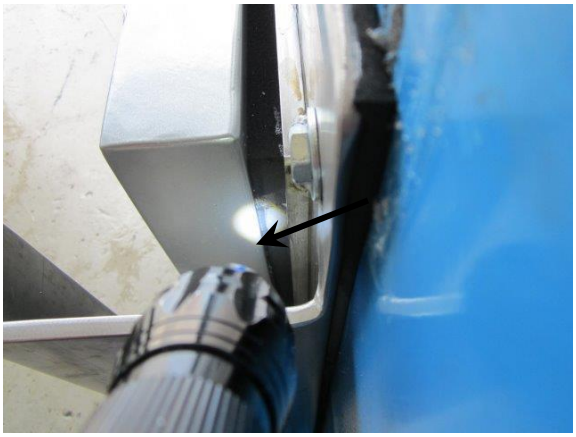

Fig. 6.2-5: Water leakage on the bolt side in the top right-hand corner (mitre joint not clean)

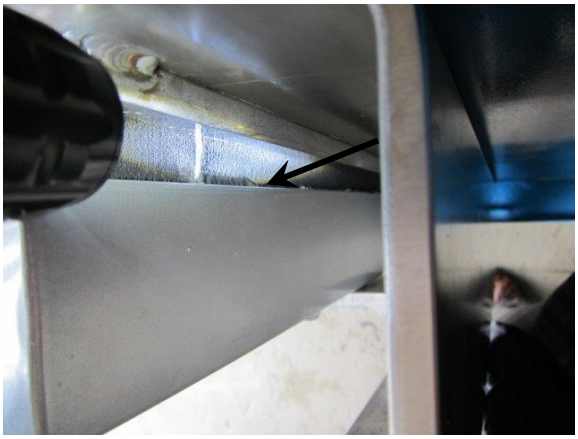

Fig. 6.2-6: Little water leakage on the bolt side

Industrie Service

Copy
The signed original is the only legally binding version

7 Test result

Blobel Umwelttechnik GmbH has had the following floodwater protection system tested successfully in accordance with the quality and testing conditions of the European Flood Protection Association with the following results:

Specimen under test:

Description:	**TYPE BL 336 HHS**
Evaluation group:	**O3 / building protection – closure sealing on 4 sides**
Clear shell opening:	1,000 mm / 1,000 mm
Damming height:	min. 1,100 mm

Test result:

Storage / transport volume:	no mobile parts	
Storage / transport weight:	no mobile parts	
Set-up time:	0.23 min./m²	**Class 0**
Leak-proofness:	0.02 litres/min/m²	**Class 1**

Comment: Classification in accordance with test conditions status November 2014

Blobel Umwelttechnik GmbH is thus authorised to use the floodwater protection quality mark for this protection system once the missing structural proofs have been provided and once the European Floodwater Protection Association has awarded them the right to use the quality mark. Evaluation group O3 must be specified in addition underneath the quality mark. The quality mark user may only use the quality mark when the evaluation group is specified and when noting the quality and testing conditions applicable for the quality mark to be awarded.

Established on 22/07/2015

TÜV SÜD Industrie Service GmbH
Civil Engineering International, Munich — Senior Expert

Gottschalk — Beike

Dipl.-Ing. H. Gottschalk — Dipl.-Ing. M. Beike