

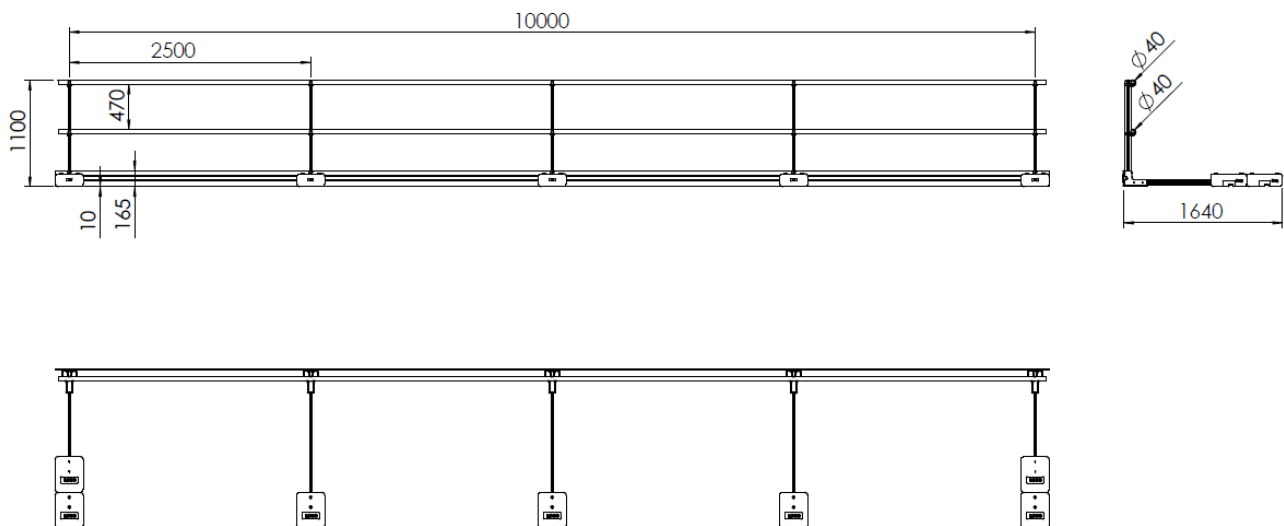
Prüfbericht-Nr.: Test Report No.:	17707894 001	Auftrags-Nr.: Order No.:	178153010	Seite 1 von 6 Page 1 of 6			
Kunden-Referenz-Nr.: Client Reference No.:	2281573	Auftragsdatum: Order date:	08.06.2021				
Auftraggeber: Client:	Qingdao Longdyes Technology Co., Ltd. Baolulai Road, Liuting Street, Chengyang District, Qingdao, Shandong, P.R. China						
Prüfgegenstand: Test item:	Railings (V4 Aluminum Guardrail Systems)						
Bezeichnung / Typ-Nr.: Identification / Type No.:	V4-FS100						
Auftrags-Inhalt: Order content:	Issue Certificate of Conformity						
Prüfgrundlage: Test specification:	EN 13374:2013+A1:2018 Temporary edge protection systems – Product specification - Test methods						
Wareneingangsdatum: Date of receipt:							
Prüfmuster-Nr.: Test sample No.:					V202009224-V4-FS100-1, V202009224-V4-FS100-2, V202009224-V4-FS100-3, V202009224-V4-FS100-4		
Prüfzeitraum: Testing period:					21.09.2020		
Ort der Prüfung: Place of testing:					As Client		
Prüflaboratorium: Testing laboratory:					TUV Rheinland/CCIC (Qingdao) Co., Ltd.		
Prüfergebnis*: Test result*:					Pass		
geprüft von / tested by:		kontrolliert von / reviewed by:					
09.06.2021 Rocky Li / PE 		11.06.2021 Vincent Sun / Reviewer 					
Datum Date	Name / Stellung Name / Position	Unterschrift Signature	Datum Date	Name / Stellung Name / Position			
Sonstiges / Other:							
This test report is for the test specimen complying to Cl.5.1.1, Cl.5.1.3, Cl.5.2.1, Cl.6.3.2 and Cl.6.3.7 of EN 13374:2013 +A1:2018.							
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery: -							
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested							
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>							

Produktbeschreibung
Product description

The V4 Aluminum Guardrail Systems is used for temporary edge protection systems during construction or maintenance of buildings and other structures. It consists of the principal guardrails, intermediate guardrails, toeboards, posts, counter weight and fastenings.

The principal guardrail is made of 1.5 mm thickness aluminum alloy pipe. The intermediate guardrail is made of 1.5 mm thickness aluminum alloy pipe. Counter weight is 25 kg per piece.

Refer to below figure for detailed dimensions for components and counter weight configuration during normal operation.



V4 Aluminum Guardrail Systems

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Liste der verwendeten Prüfmittel
List of used test equipment

Prüfmittel <i>Test equipment</i>	Prüfmittel-Nr. / ID-Nr. <i>Equipment No. / ID-No.</i>	Nächste Kalibrierung <i>Next calibration</i>
Tape ruler	1828660	2021.12.08
Load sensor	002844	2021.08.02
Vernier caliper	1810638	2021.09.04

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Clause	Requirements - Tests	Measuring results - Remarks	Evaluation

5	Requirements	See below	P
5.1	General	See below	P
5.1.1	Basic requirements An edge protection system shall consist of a principal guardrail and either an intermediate guardrail or an intermediate protection. It shall also be possible to attach a toeboard. All components in the system shall be designed to avoid accidental removal or displacement of any component in any direction during use. The components shall be designed and manufactured so that injury to persons from puncturing or lacerating of the skin is prevented.	The guardrail system consists of a principal guardrail, an intermediate guardrail and a toeboard. Comply with the requirement.	P
5.1.3	Principal guardrail The distance between the uppermost part of the principal guardrail and the working surface shall be at least 1 000 mm, at any point, measured perpendicular to the working surface, see Figure 4 and 5. The principal guardrails shall be continuous and any horizontal gaps shall be less than 120 mm.	In compliance with the requirement. Refer to below table for detailed measurement results. Horizontal gaps shall be ensured by final installation at end user's site.	P P N/A
5.2.1	Edge protection system class A The inclination of edge protection system class A shall not deviate from the vertical by more than 15°, outwards or inwards. If an intermediate guardrail is provided, any gap shall be so dimensioned that a sphere of 470 mm diameter will not pass through the protection, see Figure 4. If there is no intermediate guardrail or if it is not continuous, the edge protection system shall be so dimensioned that a sphere with a diameter of 250 mm will not pass through it.	In compliance with the requirement. The inclination is less than 15°. Refer to below table for detailed measurement results.	P

TEST SAMPLES MEASUREMENTS

Position	Sample 1 (mm)	Sample 2 (mm)	Sample 3 (mm)	Sample 4 (mm)
The uppermost part of the principal guardrail and the working surface	1102	1101	1102	1103
Gap between the principal guardrail and intermediate guardrail	469	467	467	469
Gap between intermediate guardrail and toeboard	387	388	389	388

6.3.2	Serviceability limit state Loads F_{Ti} shall act as follows: — perpendicular to the edge protection system in the outward direction, and — downwards parallel to the edge protection system.	Calculation provided and reviewed with positive results.	P
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The loads shall act separately and on posts, guardrails and toeboards.

See Figures 6 and 7 and line 1 of Table 2.
For posts and guardrails, $F_{T1} = 300$ N.
For toeboards, $F_{T2} = 200$ N.

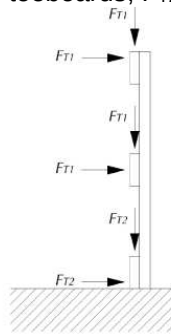


Figure 6 — Serviceability loads,
alternative 1
Loads acting separately

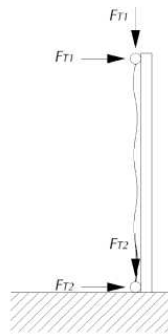


Figure 7 — Serviceability loads,
alternative 2
Loads acting separately

According to the calculation, the elastic deflection is less than 55mm.

In addition, partial key positions were tested and refer to below table for measurement results.

SERVICEABILITY LIMIT STATE TESTS RESULTS

Position	Load (N)	Sample 1 Deflection (mm)	Sample 2 Deflection (mm)	Sample 3 Deflection (mm)	Sample 4 Deflection (mm)	Requirement (mm)
Horizontal load on the principal guardrail at the post F_{T1}	300	19	17	17	20	< 55
Horizontal load on the principal guardrail in the middle of two adjacent posts F_{T1}	300	28	25	28	20	< 55
Horizontal load on the toeboard in the middle of two adjacent posts F_{T2}	200	20	21	19	22	< 55
Vertical load on the principal guardrail in the middle of two adjacent posts F_{T1}	300	20	20	23	20	< 55
Vertical load on the intermediate guardrail in the middle of two adjacent posts F_{T1}	300	21	20	20	21	< 55
Remark: Same test results were recorded for wet and dry surface conditions.						

6.3.7	Ultimate limit state with accidental loads Load F_D shall act downwards within an angle of $\pm 10^\circ$ to the face of the edge protection system, anywhere along the top edge of the guardrails and toeboards. This also applies to any other component of the edge protection	Calculation provided and reviewed with positive results.	P
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system, such as a fencing structure, which has gaps in excess of 100 mm width.

See Figure 14 and line 6 of Table 2.
 $F_D = 1250 \text{ N}$

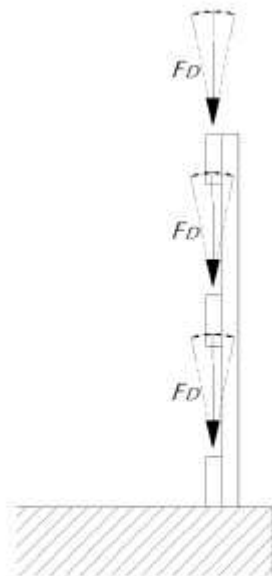


Figure 14 — Accidental load
Loads acting separately

According to the calculation, the max. deflection is less than 300mm and $E_d < R_d$ is met.

In addition, partial key positions were tested and refer to below table for measurement results.

ULTIMATE LIMIT STATE WITH ACCIDENTAL LOADS TESTS RESULTS

Position	Load (N)	Sample 1 Deflection (mm)	Sample 2 Deflection (mm)	Sample 3 Deflection (mm)	Sample 4 Deflection (mm)	Requirement (mm)
Vertical load on the principal guardrail in the middle of two adjacent posts F_D	1250	160	150	118	115	< 300
Vertical load on the intermediate guardrail in the middle of two adjacent posts F_D	1250	104	98	95	98	< 300
Remark: Same test results were recorded for wet and dry surface conditions.						

END OF TEST REPORT 17707894 001