

SGS

TEST REPORT

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CUSTOMER NAME: TIANJIN WELLMAC SCAFFOLD CO., LTD.
ADDRESS: NO.1 GUANGYUAN ROAD, TIANQIQUANTUN INDUSTRIAL LOGISTIC ZONE, JIANGSU PROVINCE, CHINA

Sample Name : Ringlock Scaffolding
Product Specification : QO48.173.0mm
Manufacturer : Tianjin Wellmade Scaffold Co., Ltd

Active information and sampling methods submitted and confirmed by the client. SGS however, assumes no responsibility to verify the accuracy, integrity and completeness of the sample information provided by client.

Quantity : 1
Date of Receipt : Sep 18, 2017
Testing Start Date : Sep 18, 2017
Testing End Date : Oct 16, 2017
Test Results : For further details, please refer to the test report refer only to the sample(s) tested.

Signed for SGS-CSTC Standards Testing Service (China) Co., Ltd.
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Kevin Zhou
Authorized signatory



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Test method:
EN 12811-1:2003 Facade scaffolds made of prefabricated components-Part 1: Products specifications
EN 12811-1:2003 Temporary works equipment-Part 1: Scaffolds - Performance requirements and general design
GB 15831-2008 Temporary works equipment-Part 2: Load testing


Test Result:

Test Clause	Test Item	Test Requirement	Test Result	Conclusion
5.1	Requirements for structural design-Action:	All action effects shall be taken into account in the design of the scaffold. The maximum deflection of any of the members shall not exceed L/300mm. The principal and the intermediate girders shall not have an elastic deflection greater than 15mm!	See Appendix A	Pass
5.7	Deflections		See Appendix A	Pass

Test clause conclusion:
Test clause does not apply to test object
Test item does meet the requirement:
Test item does not meet the requirement

NA
Pass(F)
Fail(F)

Note: Maximum extended height of base jack is 450mm as per client's requirement.



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Appendix A. Detail test result of load test and test photos

1. Requirements for structural design-Action


Test method:
EN 12811-1:2003 Temporary works equipment-Part 1: Scaffolds - Performance requirements and general design 5.7 Clause 6.2.3 Load combination: test in the service condition.

1. Sample information

Table 1 The weight of designed bay, G₁

Scaffold components	Unit Mass (kg)	Number of components in design bay (24.00m design height)	The weight of design bay, G ₁ (kg)
1.8m Standard with wight	5.20	140	
1.0m Standard without wight	4.41	4	
1.80 Ledger	7.28	4	
0.24m Base Collar	1.43	4	
1.80-3.0m Brace	12.18	4	3560
0.227*1.80m Steel Plate	1.32	4	
1200mm Base Jacks	3.70	4	
U-head (rodless)	4.25	4	

Note: (24.00m one bay, the self-weight of the assembled scaffold at its maximum design height, including all components, such as steel plate, bracing standard, base collar and so on.



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Table 2 The result of test bay, G₂


Scaffold components	Design unit Mass (kg)	Number of components in test bay (6.00m test height)	The weight of test bay, G ₂ (kg)
1.8m Standard with wight	5.01	20	
1.0m Standard without wight	4.74	4	
1.80 Ledger	7.03	4	
0.24m Base Collar	1.30	4	
1.80-3.0m Brace	13.18	4	793
0.227*1.80m Steel Plate	13.18	4	
1200mm Base Jacks	3.58	4	
U-head (rodless)	3.73	4	

Note: (6.00m one bay, the weight of the assembled scaffold at its maximum design height for the test, including all components.

EN 12811-1:2003 stipulates that the evenly distributed load applied to a working area for a load class 4 shall be 3.0kN/m².

Load class of working area	Class 4
The number of working area in design bay	One working area
Uniformly distributed load q ₁ (kN/m ²)	3.0


2. Scaffold configuration in test:
The maximum working area design height of scaffold system was 37.03m according to client's instruction while the scaffold assembly installed in test was one bay wide (1.80m) and one bay long (1.80m), the height of scaffold was 6m apart from adjustable leg. The maximum extension height of the adjustable leg was 450mm.




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Scaffold configuration



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3. Load calculation:

1) Self-weight of the scaffold:
A vertical load was applied simulating the action of self-weight of the scaffold assembly at the maximum design height in one bay on the standards. The load was distributed on the four standards through load beams.
 $F_{1k} = G_1 = 3566 - 70 = 3497 \text{ kg}$

2) Uniformly distributed service load appropriate to the class of the working scaffold applied in Table 3, column 2, acting on the working area of the most unfavorable design level.
Specification of the steel plate: 1200mm (width) * 227mm (height)
Number of steel plate in three working upright legs:
 $F_{2k} = 1.8 \times 1.8 \times 1.8 \times 3.0 = 17.724 \text{ kN}$

3) Horizontal working load applied at 2.25m
Horizontal working load:
 $F_{3k} = 2.25 \times 3.0 = 6.75 \text{ kN}$
 $F_{3k} = 600 \text{ N}$
 $F_{3k} = 300 \text{ N/m}^2$ or each leg distributed. The rational horizontal load shall be not less than 2.5% of the total of the uniformly distributed load, q₁, specified in Table 3, on that bay, or 0.3kN, which is greater.
 $F_{3k} = 1.7 \times 3.0 = 5.1 \text{ kN}$

4. Test Results:
Test procedure:
Apply the test combinations to the scaffold assembly, check the scaffold whether it is capable of resisting the worst combinations of loads to which it is likely to be subjected. The horizontal load shall be applied parallel and perpendicular to the bay separately.



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Test results:

1. Horizontal working load parallel to the bay

Test item	Test height	Value of Load	Test result	Conclusion	
Load combinations (Service condition)	6.50m	Self-weight	288.7kgf	The scaffold was capable of resisting the combination of loads without any visible deformation.	Pass
		Uniformly distributed service load	733kgf		
		Horizontal working load	173.0kgf		

2. Horizontal working load perpendicular to the bay

Test item	Test height	Value of Load	Test result	Conclusion	
Load combinations (Service condition)	6.50m	Self-weight	288.7kgf	The scaffold was capable of resisting the combination of loads without any visible deformation.	Pass
		Uniformly distributed service load	733kgf		
		Horizontal working load	173.0kgf		



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Test photo:



Test assembly



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Steel frame



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2. Deflection

1. Side protection

Test method:

EN 12811-1:2003 Temporary works equipment Part 1: Scaffolds – Performance requirements and general design

Test result:

Test item	Test location	Value of Load	Test result	Requirement	Conclusion
Deflection of the side protection	Principal guardrail	6.3 kN	1.15mm	The principal guardrail shall not have an elastic deflection greater than 1.5mm	Pass
	Intermediate guardrail		1.15mm	Intermediate guardrail shall not have an elastic deflection greater than 1.5mm	Pass

2. Plank

Sample Specification: 1800mm x 200mm x 20mm (Length x Width x height = Wall thickness)

Test method:

EN 12811-1:2003 Temporary works equipment Part 1: Scaffolds – Performance requirements and general design



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Test results:

Load class: 4

Test span	Test span	Value of Load	Test result	Requirement	Conclusion
Concentrated load on area 500mm x 500mm	1.83m	1.00kN/m ² level	The platform unit was capable of supporting the concentrated load on area 500mm x 500mm and the deflection at the center of span was not exceed 10.3mm.	The platform unit shall be capable of supporting the concentrated load on area 500mm x 500mm and the deflection at the center of span shall not exceed 10.3mm.	Pass
		2.00kN/m ² level	The platform unit was capable of supporting the concentrated load on area 500mm x 500mm and the deflection at the center of span was not exceed 10.3mm.	The platform unit shall be capable of supporting the concentrated load on area 500mm x 500mm and the deflection at the center of span shall not exceed 10.3mm.	Pass

- Note:
- When a platform unit is loaded 100mm wide, the load is reduced for this unit in proportion to its width, except that in no case the loading shall be reduced to less than 1.0 kN.
 - When subjected to the concentrated loads specified in table 3, columns 3 and 4 the elastic deflection of any platform unit shall not exceed 1/100 of its span.



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Table 3 – Service loads on working areas (see also 6.2.2)

Load class	Uniformly distributed load in kN/m ²	Concentrated load on area 200mm x 200mm		Partial area load	
		F _d kN	F _d kN	q _d kN/m ²	Partial area factor k _d
1	0.75	1.50	1.00	—	—
2	1.00	1.50	1.00	—	—
3	2.00	1.50	1.00	—	—
4	3.00	3.00	1.00	—	—
5	4.00	3.00	1.00	—	—
6	6.00	3.00	1.00	—	—

Sample photo:



Note: The above test was carried out by a SGS internal laboratory.



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