TÜV Rheinland LGA Bautechnik GmbH

By DAP Deutsches Akkreditierungssystem Prüfwesen GmbH
accredited test laboratory DAP-PL-1524.14.

Certified in accordance with DIN EN ISO 9001

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Test report

No. 94605497-01 **Date: 2012-06-18**

Client: Changzhou Zhechang Gas Spring Co.,Ltd.
No.198, Jiang Gongan Industrial Park,
Hutang Town, Wujin District ,
Changzhou City, Jiangsu Province
China

Commission dated: 2012-03-29

Nature of commission: To carry out type testing in accordance with DIN 4550: 2004-12 class 3 on bearer element external tubes for swivel chairs and swivel armchairs.

Test material: 50 bearer element external tubes,

Tube type:	120#
Tube material:	20 acc. GB/T 3639-2008
Wall thickness:	2,0 mm
Surface:	Hard chrome plated

Sampling: By TÜV Rheinland (Shanghai) Co., Ltd. from current production

Test period: 2012-05-14 until 2012-06-01

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This report comprises 4 pages and 1 appendix.

The results refer exclusively to the tested samples.

This report may be published only in full length.
Each publishing of parts of this report has to be authorized by TÜV Rheinland LGA Bautechnik GmbH in advance.

For order processing essential data and your address were recorded.
Data protection is ensured.

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1 Commission

The competence centre metals of TÜV Rheinland LGA Bautechnik GmbH, Nuremberg, was commissioned by Changzhou Zhechang Gas Spring Co.,Ltd., to carry out type testing on self-supporting seat height adjusting elements (bearer tubes) for swivel chairs and swivel armchairs.

The type testing was intended to produce proof of stability class 3 in accordance with DIN 4550, tube type 120#, tube material 20 acc. GB/T 3639-2008, surface treatment hard chrome plated.
The regulations valid in the Federal Republic of Germany were applied in carrying out the commission. The scope and type of tests, as well as the evaluation of the results were based on:

- DIN 4550, edition 2004-12
- DIN 50100, edition 1978-02
- DIN EN ISO 17638, edition 2010-03
- as well as the appropriate DIN/EN/ISO standards and regulations, each in the latest edition.

2 Manufacturing conditions

Changzhou Zhechang Gas Spring Co.,Ltd. manufactures, seat height adjusting elements of different types and systems for the Asian, Russian and South American market and will expand to the Western market. The following statements may be made concerning manufacturing conditions:

- The production facilities represent the current state of the art, are in faultless condition, and are operated by experienced personnel. They are suitable for the manufacture of bearer elements for specific conditions.
- The personnel and factual pre-conditions have been fulfilled.
- The test equipment necessary to carry out quality supervision is available and suitable for the task.

3 Factory inspection and sampling

During a factory inspection on 27. April 2012, the production conditions and marking regulations of the bearer elements, in accordance with DIN 4550, were fully discussed.

The official sampling took place on 10.04.2012.

50 bearer tubes, tube type 120# from an amount of 100, were taken at random from the current production.

4 Quality management system

A quality management system in accordance with ISO 9001 has been installed and was certified by:

Beijing Xingguo Global Certification Co.,Ltd

Details of certificate:

Registration No.: 01712Q10519R0S

Issued: 16. April 2012

Expiry: 15. April 2015

5 Carrying out of type testing, test conditions

32 bearer tubes were taken at random from a quantity of 50 pieces and tested with a load of ± 210 Nm as load-controlled, alternating bending tests, up to a limiting value of stress cycle endured of 2 x 10^6 load alternations in series of eight on a hydro-pulse system (Class 1 - DIN EN ISO 7500-1).

The samples were clamped in place using suitable devices, so that the test forces used acted parallel to the longitudinal axis of the tubes. The effective distance of the test force was 150 mm, while the test frequency was 8 Hz.
The load application elements were so designed that the total cone length of 32 mm was covered.

The acceptance cones were pressed on the bearer elements in a universal test rig with a pressure load of 15 kN. To ensure the acceptance cone/bearer element connection, facing cones in accordance with illustration 4, DIN 4550, with a screw starting torque of 20 Nm were used.

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The free test length between the clamping units was 50 mm.

The labelling according to DIN 4550 chapter 9 were engraved on the bearer tubes. This had no influence on the cyclic loading behaviour of the tubes, however. Such marks may be placed below the cone.
After the mechanical tests, the tubes were examined for cracks by a magnetic particle test.

6 Test results and appreciation

The individual results are listed in the enclosure. The result of the crack test may also be seen in the enclosure.

The test results refer to the samples as in the condition taken and tested.

The type testing for the tube type 120# to class 3 - DIN 4550 was complied with.

TÜV Rheinland LGA Bautechnik GmbH
Competence Centre Metals

Dipl.-Ing. (FH) STRADTNER

TÜV Rheinland LGA Bautechnik GmbH Materialprüfinstitut

Expert

Dipl.-Ing. (FH) KNÖLLINGER

Enclosure to 94605497-01

Result of fatigue tests in alternating bending area on bearer element external tubes,

Tube type: 120#,
Property class: Class 3 – DIN 4550:2004-12
Wall thickness: 2,0 mm
Tube material: 20 acc. GB/T 3639-2008
Surface: Hard chrome plated

Serial sample no.	Serial bearer tube no.	Cone coverage %	Alternating bending moment M_a Nm	Load alternation achieved 10	Result of crack test
1	1	100	±210	2,000	No cracks
	2	100	±210	2,000	No cracks
	3	100	±210	2,000	No cracks
	4	100	±210	2,000	No cracks
	5	100	±210	2,000	No cracks
	6	100	±210	2,000	No cracks
2	7	100	±210	2,000	No cracks
	8	100	±210	2,000	No cracks
	9	100	±210	2,000	No cracks
	10	100	±210	2,000	No cracks
	11	100	±210	2,000	No cracks
	12	100	±210	2,000	No cracks
	13	100	±210	2,000	No cracks
	14	100	±210	2,000	No cracks
3	15	100	±210	2,000	No cracks
	16	100	±210	2,000	No cracks
	17	100	±210	2,000	No cracks
	18	100	±210	2,000	No cracks
	19	100	±210	2,000	No cracks
	20	100	±210	2,000	No cracks
	21	100	±210	2,000	No cracks
	22	100	±210	2,000	No cracks
4	23	100	±210	2,000	No cracks
	24	100	±210	2,000	No cracks
	25	100	±210	2,000	No cracks
	26	100	±210	2,000	No cracks
	27	100	±210	2,000	No cracks
	28	100	±210	2,000	No cracks
	29	100	±210	2,000	No cracks
	30	100	±210	2,000	No cracks