

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-21/0689
of 9 February 2022

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General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

GERB - steel spring elements

Product family
to which the construction product belongs

steel spring element

Manufacturer

GERB Schwingungsisolierungen
GmbH & Co. KG
Roedernallee 174-176
13407 Berlin
DEUTSCHLAND

Manufacturing plant

GERB Schwingungsisolierungen
GmbH & Co. KG
Roedernallee 174-176
13407 Berlin
DEUTSCHLAND

This European Technical Assessment
contains

8 pages including 4 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 200112-00-0301

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Specific part

1 Technical description of the product

The product is a compression steel spring element.

The GERB - steel spring elements are composed of upper and lower housings, made of welded structural steel, calculated in accordance with the relevant part of EN 1993-1 and manufactured in accordance with EN 1090-2:2018, with a defined quantity of helical compression springs inserted in between, depending on the required load capacity. The materials of the helical compression springs are in accordance with EN 13906-1:2013, tables 3 or 4. In addition, there is the possibility to insert narrower (inner) springs in wider (outer) springs to achieve a higher load capacity in small spaces. For positional stability and shear connection, springs are placed in or around spring guides welded on the upper or lower housing.

The arrangement of the compression springs can be executed in one or more rows in the steel spring element. The outer and inner springs can be placed individually or inserted into each other.

For transport and installation as well as for prestressing of the steel spring element to a predefined installation height, the housings are connected and screwed together with steel bolts, washers and nuts.

Examples of steel spring elements are given in Annex B.1 and B.2.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The GERB - steel spring elements can be used for passive isolation of buildings and building parts from undesired vibrations, tremors and structure-borne noise caused by the environment (rail traffic, industrial machines, etc.). The structures that require isolation are stored on steel spring elements and thus decoupled from the ground and its movements.

Also, the active isolation of building parts from retransmission of vibrations to other parts is possible (parking areas, supply areas, etc.). For this method, the concerned area is stored on steel spring elements and thus isolated from the remaining building structure. The steel spring elements can be adopted for statical or quasi-statical loads.

The steel spring elements are intended to be used in environmental conditions where they are protected against corrosion.

The performances given in Section 3 are only valid if the steel spring elements is used in compliance with the specifications and conditions given by the manufacturer and in Annex A.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the steel spring elements of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment**3.1 Mechanical resistance and stability (BWR 1)**

Essential characteristic	Assessment method	Performance
Vertical stiffness R	EAD, 2.2.1	See Annex B
Vertical load bearing capacity F_n	EAD, 2.2.2	
Horizontal stiffness R_Q	EAD, 2.2.3	NPA
Horizontal load bearing capacity F_Q	EAD, 2.2.4	

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Assessment method	Performance
Reaction to fire	EAD, 2.2.5	Performance Class A1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. EAD 200112-00-0301, the applicable European legal act is: 1998/214/EC, amended by 2001/596/EC.

The system to be applied is: 2+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 9 February 2022 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Schult

Annex A

A.1 Assumptions concerning Installation

The installation of the steel spring elements is carried out under the following conditions:

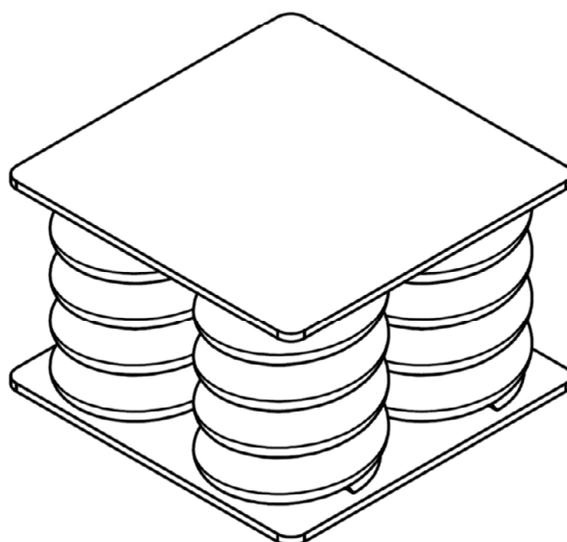
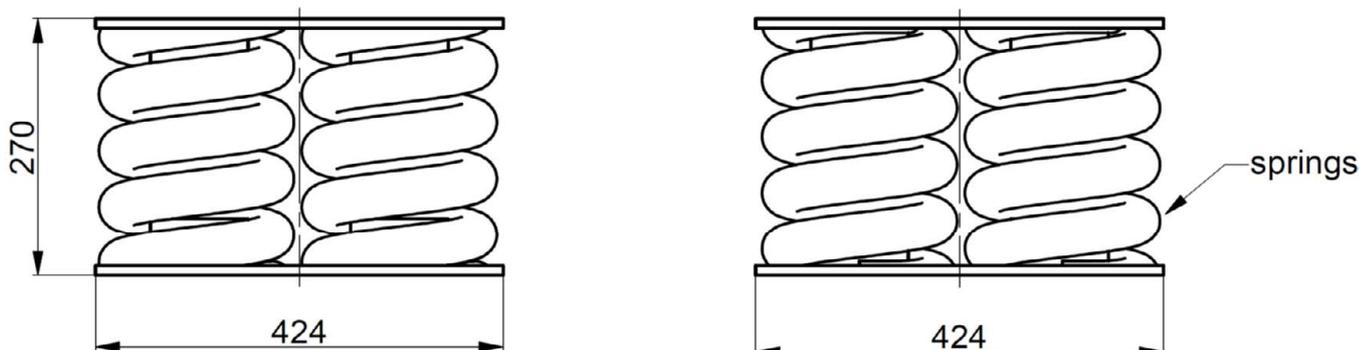
The installation is only carried out according to the manufacturer's instructions. The manufacturer hands over the assembly instructions to the assembler. From the assembly instructions it is followed that, prior to installation, all components of the steel spring element shall be checked for their perfect condition and that damaged steel spring element shall not be used.

The conformity of the installed steel spring elements with the provisions of the ETA is attested by the executing assembler.

A.2 Indications to the manufacturer

The manufacturer shall ensure that the information on the specific conditions is given to those who are concerned. This information may be given by reproduction of the European Technical Assessment. In addition, all essential installation data shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

The steel spring elements shall be packaged and delivered as a complete unit only.



Steel plate: S235

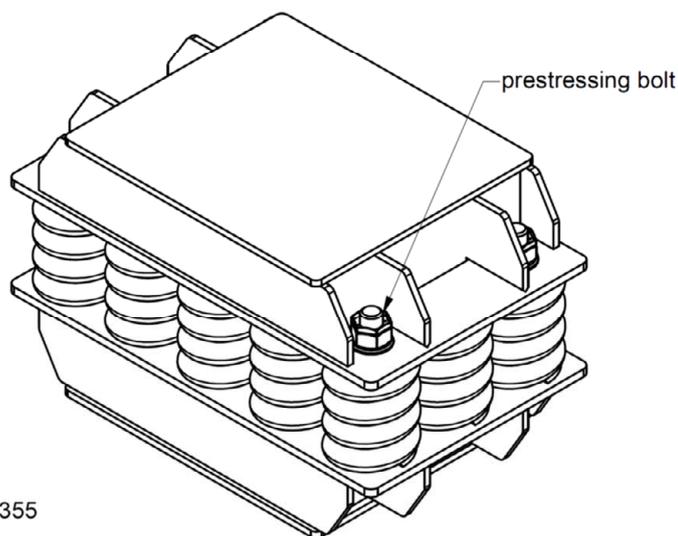
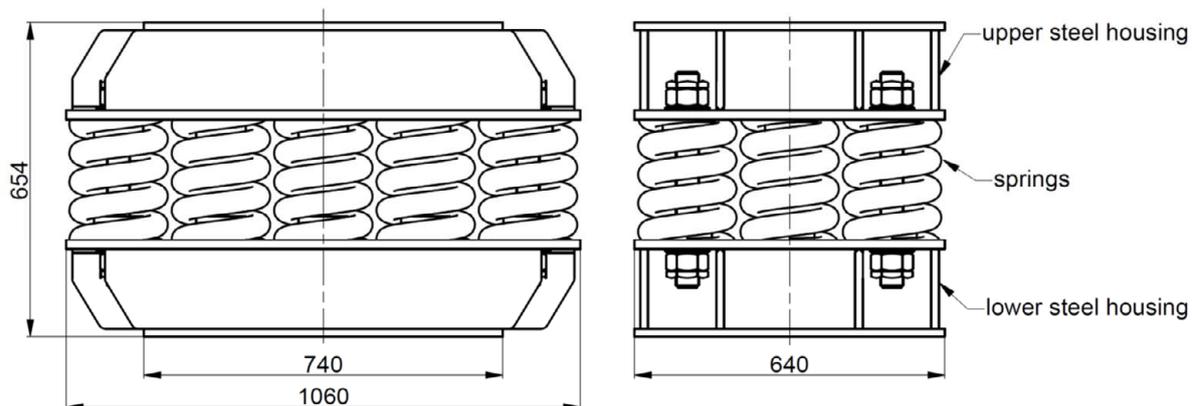
Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Vertical stiffness R	17.5 kN/mm
Vertical load bearing capacity F_n	501.8 kN

GERB - steel spring elements GERB – steel spring elements

Sample of a steel spring element – small model
Performance, materials and main dimensions

Annex B.1



Steel plate: S355
Bolt: 8.8
Nut: 8

Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Vertical stiffness R	65.6 kN/mm
Vertical load bearing capacity F_n	1881.7 kN

GERB - steel spring elements GERB – steel spring elements

Sample of a steel spring element – large model
Performance, materials and main dimensions

Annex B.2

B.3 Assumptions concerning the calculation of resistance and stiffness

B.3.1 Vertical stiffness

The vertical stiffness of the compression steel spring element R is the sum of the vertical stiffness of the single springs determined by using the formula according with EN 13906-1, Section 9.4:

$$R = \sum_{i=1}^m \frac{G_i \cdot d_i^4}{8 \cdot D_i^3 \cdot n_i}$$

with:

- D : mean diameter of coil
- d : nominal diameter of wire
- G : modulus of rigidity (see EN 13906-1; Table3)
- n : number of active coils
- m : number of springs

B.3.2 Vertical load bearing capacity

The load bearing capacity F_n of the steel spring element is the product of the vertical stiffness R of the steel spring element and the vertical displacement s_n .

$$F_n = R \cdot s_n$$

with

$$s_n = s_c / 1.35$$

s_c : spring deflection, for the solid length L_c (EN 13901-1, section 9.10)

It must also be ensured that instabilities and plastic material behavior are excluded.

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Calculation of resistance and stiffness

Annex B.3