



GRANIT
QUALITY PARTS

TOP LINKS

PRODUCT BENCHMARK

CUSTOMER INFORMATION

TOP LINKS - CAT. 2 - M30

The Cat. 2 top links from GRANIT 20011535, were compared with the corresponding products from a leading original equipment manufacturer and six European competitors.

COMPARISON OF FEATURES

- » Determining the tensile strength at break of the complete top links
- » Analysis of the material composition at the top link eyes

TEST RESULTS

DETERMINING THE TENSILE FORCE AT BREAK OF THE COMPLETE TOP LINKS

When determining the tensile force at break, complete top links are subjected to maximum tension until they break. This test simulates the very high longitudinal loads to which the top link is exposed.

- GRANIT top links are extremely resilient.
- Determining the tensile force at break revealed that the GRANIT top links can absorb the highest tensile loads and withstand the most overloading. This makes them heavy-duty products for the highest demands.
- Comparison of the manufacturers' test results: GRANIT: 33.0 t | Original manufacturer: 30.4 t. The competitors' products all achieved values below (and in some cases far below) those achieved by the products from GRANIT and the original manufacturer. They achieved the following values: 29.4 t | 24.4 t | 22.6 t | 21.9 t | 16.0 t | 14.4 t
- It was found that the Cat. 2 top links and an M30 thread from the competitors sometimes have significantly smaller wall thicknesses than the GRANIT products. This may be due to cost savings made at the expense of quality.

BENDING TEST ON THE TOP LINK SPINDLES UP TO A BENDING ANGLE OF APPROX. 30°

This test provides information about the products' ability to absorb shear forces. Top link spindles without proper heat treatment can break when subjected to lateral loads.

- GRANIT top link spindles protect your machines.
- Lateral overloading does not cause the GRANIT top links to break. This can protect against irreparable damage to your machines. Only the top links from the original manufacturer and one competitor also passed the test without breaking.

Bending angle of 30° without breakage: GRANIT, original manufacturer and one competitor.

Other competitors: breakage with shear force from approx. 20°.

- Cutting costs during heat treatment can cause serious machine damage.

TEST REPORT NO. 2019-01/1255



Steinbeis-Transferzentrum
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This product comparison was carried out on behalf of GRANIT PARTS by the Steinbeis Transfer Center laboratory.



» Bending test on the top link spindles up to a bending angle of approx. 30°

STRUCTURAL ANALYSIS OF THE TOP LINK EYES

A comparison of the micrographs of the top link eyes provides information about the metal's ability to withstand breakage. The finer the structures in the micrographs, the tougher the top link eyes.

- GRANIT top link eyes have an extremely tough, fine and uniform intermediate stage structure.
- They do not break when overloaded, but deform. The user can see if the top link is overloaded when changing machines, and the risk of serious damage to implements is reduced.
- The top link eyes from GRANIT and the original manufacturer were widened after the tensile test. **The top link eyes from the other competitors broke without warning.**
- Inadequate heat treatment can lead to major machine damage without warning.



» Structural analysis of the top link eyes

ANALYSIS OF THE MATERIAL COMPOSITION AT THE TOP LINK EYES

The material composition provides information about the material used. High-quality materials are an indicator of high-performance products capable of withstanding loads even at the limit.

- GRANIT top link eyes are made of C45 steel. This offers a perfect compromise between price and performance.

C45 is a quenched and tempered steel capable of withstanding the highest loads. As a high-grade structural steel which due to its low phosphorus and sulphur content tends to have minor foreign inclusions (e.g. made of aluminium or manganese), it is capable of withstanding the highest loads.



Micrograph

Image 33

Top link, Cat. 2-2, identifier 7

Supplier: GRANIT, part no.: 20011535

Comment:

- Sample taken from the top link eye
- Fine, uniform intermediate stage structure



Micrograph

Image 25

Top link, Cat. 2-2, identifier 3

Supplier: original manufacturer

Comment:

- Sample taken from the top link eye
- Coarse, non-uniform, standardised structure

CONCLUSION:

GRANIT TOP LINKS ARE FANTASTIC PRODUCTS

- The GRANIT Cat. 2 top links consistently achieve top values in our comparison.
- Extremely resilient when subjected to tensile and lateral forces.
- Perfect interplay of material and heat treatment know-how.
- Deformation is clearly visible to the user before cracks or breaks occur, meaning that serious consequential damage to machines is avoided.
- GRANIT Quality Parts offer an optimum price-performance ratio.