



RAL

GÜTEZEICHEN



... for safe fastening

Gütegemeinschaft Rohrbefestigung

Safety. Reliability. Transparency.

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Modern pipe supports fulfill many tasks in today's building services. They are to be found in various applications and designs. There are very many different system solutions on the market. Many products are often indistinguishable at first glance. The choice of the right product is, however, of the utmost importance for planners, workmen and building owners.

One cannot afford to make the wrong decision here!

The right product

The mechanical performance of pipe supports is surely one of its most important product characteristics. The technical data decides how deployable a product is, in every application. Naturally, the choice of product does not rest solely on the mechanical characteristics of a pipe support – quality, service, availability and of course also price are some of the other decision-making criteria, to be considered. Without reliable technical data, however, any product choice is a gamble. So, the mechanical performance is the core criterion for planning, assembly and use of pipe supports.



Manufacturer's data – what more does one need?

One will find technical data about pipe supports in any manufacturer's catalogue; recommended loads, section moduli, and many other specifications. Can one, as a planner or fitter, depend on this information? The question is put wrongly. The question should be: Can this information be compared? A safe choice of product can only then be made, when the catalogue data from various manufacturers can be compared. Reliable data means that the information is determined according to a comprehensible evaluation process. Comparable data means that all information has been determined by way of the same evaluation system. This is a great difference. The manufacturers' traditional evaluation methods are sometimes extremely different, so that to compare their data is often hardly possible.

Comparable, reliable values

The Quality Assurance Association for Pipe Supports has created comprehensive regulations, containing clear precise, procedures for determining the mechanical technical characteristics of pipe supports. These regulations are a core component of the quality assurance RAL-GZ 655 "Pipe Supports", which is published by the RAL (German



Institute for Quality Assurance and Certification). These technical rules underwent a comprehensive voting procedure, in which the

relevant specialist and consumer groups were involved, prior to publication. The evaluation procedures described were recognised as correct and reasonable. Technical data that has been determined by this method is reliable and comparable. The RAL Quality Mark "Pipe Supports" denotes products whose technical performance has been determined by way of this proven procedure.

Trust requires quality

Pipe supports are often mass-produced. Thus it is of great importance that the desired product characteristics are always guaranteed, even in the case of larger quantities. A high grade quality assurance from the manufacturer is therefore indispensable. Manufacturers of quality assured products have to demonstrate especially high quality. Before a pipe support is approved for initial testing, the manufacturer is obliged to prove his ability to independently monitor the products. No product is awarded the quality mark without this assurance. The manufacturer is also obliged to carry out this monitoring regularly and correctly.

Neutrality creates trust

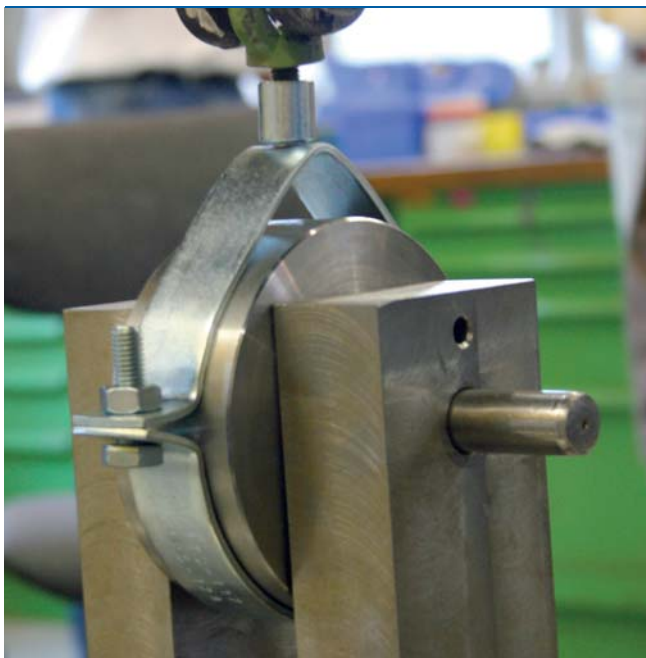
Effective quality assurance and self-monitoring are important instruments for a premium manufacturer. This alone, however, is not sufficient to be awarded the RAL quality mark, "Pipe Supports". An indispensable element of the quality assurance RAL-GZ 655 is the carrying out of initial tests and regular external screenings by a recognised, independent test centre. This neutral auditing of the products effectively ensures that the manufacturer's catalogue data is not just individual manufacturer information but rather neutrally tested, reliable and comparable details. The Quality Assurance Association for Pipe Supports works exclusively with internationally recognised test centres. It is the combination of continuous self-monitoring by the manufacturer and external monitoring by independent test centres, which creates the basis for trust distinguished by the RAL quality mark.

Quality mark RAL-GZ 655 “Pipe Supports”

The technical regulation RAL-GZ 655 contains rules for the most varied types of pipe supports, and characterises pipe clamps, brackets, mounting rails and equipment. Technical performance and quality are proven in comprehensive, neutral tests, and the resulting security is an advantage to all involved in construction.

Pipe clamps

Pipe clamps form the heart of any pipe mounting. They are practically ubiquitous in the field of installation, although they are often treated neglectfully. The pipe clamp is a good example to demonstrate the importance of a uniform, reliable and comparable evaluation process. Let us look at the simplest mechanical characteristic: behaviour under static, central tension the ultimate burden for a pipe clamp.

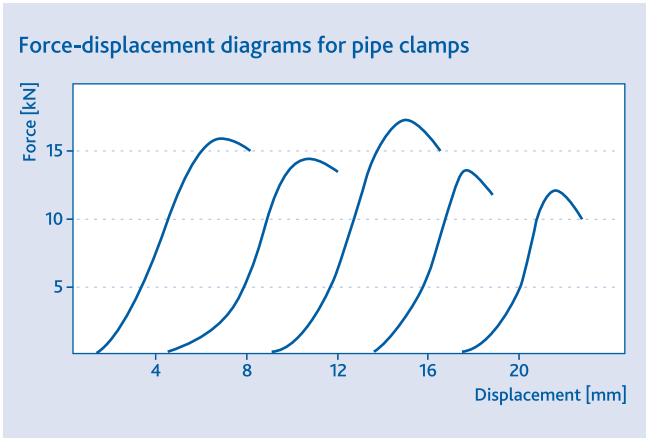


Testing a pipe clamp

Two important factors may generally be determined:

1. The deformation of the clamp under load effect.
2. Breakage of the clamp under load effect.

The latter detail is the absolute classic specification for pipe clamps. Both may well be observed by way of a force-displacement diagram:



The classic evaluation of a pipe clamp only takes its breaking behaviour into consideration. However the breaking load can differ from clamp to clamp in a given series. Even the way in which this scattering is considered, can give rise to very varied technical data. Manufacturer-specific procedures can, therefore not give rise to comparable values. To determine the usability of a pipe clamp, its break-load and especially its expected deformation under load effect are of exceptional importance. Many traditional manufacturing procedures do not even consider this deformation, or do so only insufficiently.

Exactly how the permissible load on a pipe clamp is determined, with respect to break-load and deformation, is clearly defined in part B of RAL-GZ 655. This is done by way of proven and recognised statistic methods, which take possible scatterings into account. Because of this, the technical data relating to quality-assured pipe clamps offers especially high levels of safety and usability.

Mounting Rails

The relevant regulations for mounting rails used in pipe mounting are summarised in part C of RAL-GZ 655. Mounting rails are the most versatile building elements used in pipe mounting. They allow for the most varied solutions for almost any mounting task. Professional use of mounting rails without knowledge of their mechanical characteristics is absolutely not to be recommended. The main values of a mounting rail, which must be known before mounting, are its basic material, yield point, area values (geometric moment of inertia), and details of section modulus and corrosion behaviour.

Mounting rail equipment / connection designs

The mounting equipment available, such as rail connectors or angles, makes the mounting rail very versatile in its uses. At times complete construction systems are sold, in which case the interaction of the various individual components is of particular interest.

Part D of the RAL-GZ 655 contains the relevant procedures for evaluating such component combinations. Where combinations of types of connectors and respective mounting rails can be described by common technical data, these are known as "connection designs". In the case of quality-assured connection designs, the relevant technical data is determined by a neutral entity based on this evaluation regulation.

Brackets

For brackets, which are awarded the pipe support quality mark, two new values are determined over and above the usual technical data: The 'Limit Torque' and the respective maximum lever to be constructed over the limit torque. Both values facilitate an especially quick choice, fitting for a construction site. Of course the choice of bracket can also still be made using a classic calculation. The type of surface upon which the brackets are to be mounted should, however

always be considered when using brackets. Appropriate mounting systems (e.g. anchors), with the right dimensions, should be chosen according to the type of surface. The type of surface can have a great effect on the forces to be considered. The relevant evaluation methods may be found in part E of the RAL-GZ 655.

RAL quality assurance in construction

RAL quality assurance stands for neutrally tested and proven quality in construction.

Current information about RAL quality associations, in all aspects of construction, and their products can be found in the internet under:

www.ral-guetezeichen.de.





The quality mark "Pipe Supports"

Only the Gütegemeinschaft Rohrbefestigung has been invested with the authority by RAL to award the quality mark. Following the relevant application, this RAL quality mark can only be awarded to products, which completely satisfy the high requirements made of quality-assured pipe supports.

These requirements are defined in the RAL-GZ 655 quality and test specifications. All products are thoroughly evaluated by a neutral, independent test centre before the mark is awarded. And all products awarded the mark are subject to continuous external monitoring by this test centre and by the quality association. The technical performance of these pipe supports is neutrally determined, using modern methods. Thus the quality



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mark for pipe supports offers safety and orientation in choosing pipe mountings.

The RAL quality mark distinguishes itself through the high level of trust it enjoys among planners, trades and in commerce.

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