

HARMONY IN ACTION

Bearings manufactured in the European Union are now required to meet new harmonised standards, report **Gianni Moor and Colm O'Suilleabhain**

Design, constructional detailing, manufacture and testing of bearings in the European Union is now governed by the harmonised European standards. The coexistence period for the European standards for several types of bridge bearings with pre-existing national standards ended at the beginning of this year. Elastomeric bearings and pot bearings are two of the types affected: now governed by EN1337 Part 3 and Part 5 respectively. Among other requirements, the standard specifies rules for design, for constructional detailing, for control and monitoring of fabrication by the manufacturer and by independent third parties, and for testing. Those bridge bearings which satisfy all the requirements contained in the standard are eligible for labelling with the CE symbol.

Bearing design in accordance with EN1337 refers to design level loading, which is roughly equivalent to ultimate limit state loading according to BS 5400, and defines how these should be calculated.

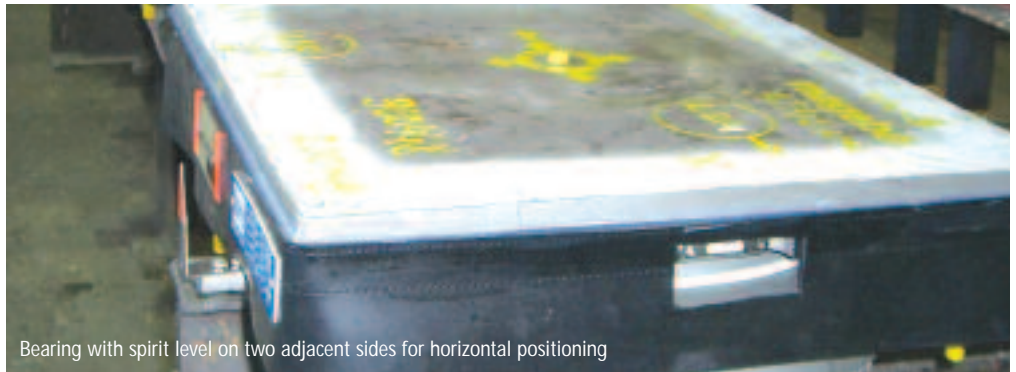
EN1337 Part 2 states: 'Provision against contamination of the sliding surface shall be made by suitable devices. Such protection devices shall be easily removable for the purpose of inspection'. This may be achieved by the provision of a simple removable rubber apron around the bearing. This apron is connected by a Velcro-type fastener, allowing it to be easily removed without tools for inspections and so on. Alternatively the bearing can be fitted with bellows dust protection in line with the German approval requirements.

The same European standard also states: 'In order to ensure bearing alignment in accordance with EN1337-11 a reference surface or other suitable device shall be installed on the sliding element. The deviation from parallel of the reference surface with respect to the plane sliding surface shall not exceed 0.1%. This may be achieved by the provision of two spirit levels per bearing, one each in the x- and y-directions, which can be used to check the level both during installation and when the bearing is in service. Alternatively it may be fitted with a three-point measuring level in line with German approval requirements.

Similar to pot bearings, spherical bearings are required by EN1337 Part 7 to be provided with dust protection for sliding surfaces and a means of ensuring horizontal positioning.

Elastomeric bearings are required by EN1337 Part 3 to be permanently labelled as a means of verification of compliance with the standard. Some labels go a little further than the code requirements. These labels display the key information on the side of the bearing as well as on the top surface, allowing it to be read even after installation.

The standard covers the design and manufacture of elastomeric bearings using different materials, including CR, NR, and 'NR with a CR shell'. The latter combination was developed to economise the production of elastomeric



Bearing with spirit level on two adjacent sides for horizontal positioning



Above: Assembly of a spherical bearing
Below: Pot bearing in accordance with EN 1337 and also with German U-label approval



bearings for markets where the traditionally more expensive CR material was deemed necessary for its superior resistance to ozone. However new improved NR materials which use additives to achieve the ozone resistance rating 'zero' are likely to reduce the significance of the hybrid version. Elastomeric bearings may also be provided with PTFE plates on one surface to facilitate sliding.

EN1337 specifies the internal quality controls that must be performed by the bearing manufacturer, and how these must be documented, for example by means of materials certificates, welding certificates, and so on. It also requires external monitoring of the production process by an approved independent body, to ensure that the manufacturer's production facilities and procedures comply with the standard by means of a thorough initial assessment before issuing of initial certification, and subsequent regular checks to ensure that standards are being maintained.

This system of internal documentation of the production process, combined with independent third party monitoring, helps ensure the quality of bearings manufactured in accordance with EN1337, permitting them to be marked

with the CE label. The testing that each type of bearing must undergo is defined by EN1337. For example, elastomeric bearings must be tested, among other things, for tensile strength, elongation at break and hardness before and after artificial ageing; minimum tear resistance and compression set; ozone resistance.

As part of the initial certification process, elastomeric bearings must also be subjected to a pressure test with 2×10^6 load cycles and applied stress of 25N/mm^2 , and the pressure stiffness/pressure modulus before and after must be verified.

The introduction of this standard represents an important step not only for the bridge bearing industry in Europe but also further afield. Such harmonisation of standards serves the general economic and political purposes of the European common market, and in particular benefits the consumer by increasing competition among suppliers.

From now on, bridge designers will be obliged to specify bearings in accordance with EN1337, removing local advantages enjoyed by bearing suppliers in their home markets.

The harmonisation of standards will also permit bearing manufacturers to focus their efforts on a single standard for the European market, simplifying their processes and reducing their costs, resulting in reduced costs to the purchaser. The great majority of bridge building and maintenance projects are funded by public money hence any savings will benefit the tax-paying citizens of Europe.

Authorities around the world will be able to specify the supply of bearings in accordance with a truly international standard, with the opportunity to purchase from a much wider range of suppliers than has previously been the case.

This increased competition should be considered as an opportunity by bearing manufacturers, not a threat. Manufacturers that supply good quality products at reasonable prices will prosper – but in the future will be able to benefit from opportunities in foreign markets on a greater scale ■

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