



Quality Alert

Failure of gate hinges leading to leaf falling

The following has been notified, via Essex County Council Health and Safety Forum, regarding the failure of an industrial gate hinge not complying with BS EN 12604 or BS 1722. Whilst BS EN 12604 concerns mechanical requirements and tests for the safety of both powered and non-powered versions of products, BS 1722 covers a wide range of gate types incorporated into different fence types. The specification clause on hinge design is consistent throughout these standards, such that failure of a single hinge does not allow the gate to fall. Hinges must be designed to take the load of the gate plus 100 kg applied at the nose of the gate without deflection in any position detrimental to its operation. Each hinge mechanism used shall be designed to bear a load equal to 3.5 times the weight of the finished gate leaf.

Whenever the term “door” is used in either Standard it covers a wide range of types and variances of doors, gates and barriers in the scope of the Standard.

The investigation by the HSE concerned a gate that fell due to a failure of a hinge. As part of this investigation the HSE Inspector is questioning why anti-drop devices had not fitted to the gate to meet clause 4.3.5 of the BS EN 12604 standard.

Hinged door leaves shall be safeguarded against dropping when in normal use or when a failure of a single element of the fixing system occurs. The door leaf shall not be able to move uncontrolled if a component fails. In case a hinge or other supporting means breaks or is damaged, the anti-drop safety device shall be able to keep the leaf in position with a maximum displacement of 300 mm from the rotation axis. The door shall also be fitted with a device which avoids that the door leaf, during the opening or closing movement, can be lifted more than 50 % of the length of the pin of the hinges or any other supporting means (“anti-lifting” device).

The example provided from the HSE Inspector of a suitable design to meet the specification is a restraining strap secured to the gate post. Inversion of the upper hinge is common practice with gates to prevent them being lifted off their hinges. This meets a security requirement in the British Standard and whilst the Standards give examples of hinge arrangements this inversion method is not specifically excluded. The practice of supporting a gate on a single hinge was criticised by the HM Specialist Inspector in 2013 following a Coroners Inquest into a death caused by a falling gate due to a fatigued lower hinged eye bolt configuration in a two hinge gate design.

Discussion with the trade association DHF and campaigning group Gate Safe recommend that the design of a gate covered within the scope of British Standards and the requirement for anti-drop restraining straps or other design, such as a redundant third hinge, is a matter of risk assessment for each type/weight of gate, user and location.



This advice should be used, where the above is applicable, and the information discussed with your team highlighting the following points:

- Ensure a suitable specification is provided for gates/barriers referring to the relevant British Standard
- The designer completes a risk assessment for the type and specification of a gate/barrier covered within the scope of the British Standards with reference to the provision or omission of any safety devices to meet the requirement of the Standard



Everyone has the right to be

100% Safe