

Assessing Fire Damage in Steel Structures

Metal hardness testing devices in fire damage assessment

Overview

At Screening Eagle Technologies, we specialize in providing innovative solutions for testing and assessing structural integrity. In a recent case study, there was a challenging scenario at Kirkintilloch High School in Scotland involving suspected fire damage to steel structures during construction.

Challenge

Following a suspicious fire incident during the school's construction, visual inspections suggested potential deformation of a steel beam. However, uncertainty lingered regarding the extent of damage caused by the fire.



Solution

To address this uncertainty, they employed our Equotip Hardness Testers, including Equotip 550 Leeb, Equotip Live Leeb D, Equotip Bambino 2, and Equotip Piccolo2. These devices are invaluable for assessing fire damage in steel structures. The fire damage assessment included on site hardness test result and analytical approach in the structural fire design. As the steel temperature was not recorded during a suspicious fire incident, it is not possible to examine if the maximum steel temperature was greater than 600° C. Hence, a hardness test was required to determine the residual strength of steel after the fire incident.

Results

The hardness test results revealed that the steel beam retained its original design strength of 275 N/mm² post-fire. The average Vickers hardness numbers ranged from 127 to 172, well within the acceptable limits for grade 275 tested steel. Notably, the hardness values at the top flange were relatively higher than those in the web and bottom flange. This indicates that the steel beam maintained its integrity despite the fire damage, retaining a 60-minute fire resistance rating.



Conclusion

Through meticulous assessment using Equotip Hardness Testers, our products provided crucial insights into the structural integrity of the steel beam post-fire. These findings reassured stakeholders of the school's safety and underscore the effectiveness of our solutions in evaluating fire damage in steel structures. At Screening Eagle Technologies, we remain committed to delivering reliable assessments for building resilience and safety, protecting the built world.



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