

Z-Quality

Z-quality BS EN 10164 (*Steel products with improved deformation properties perpendicular to the surface of the product – Technical delivery conditions*) defines three Z-quality classes – Z15, Z25 and Z35. As a through-thickness specimen cut from the steel product is stretched it reduces in area by ductile “necking” before fracture. To meet Z35 quality, three specimens must average at least 35% reduction in area in this test with no individual value below 25%.

The principle reason why a steel product would not meet this requirement is because impurity elements, in particular sulfur, are precipitated along grain boundaries, thus reducing inter-granular adhesion. Also, if steel products are rolled from ingots (as opposed to the continuous casting method used mainly today) “dirty” non-metallic inclusions are more likely and these will provide obvious weakness in the through-thickness direction. Hence, specifying a “clean” steel with low sulfur content is often used as a “proxy” for Z-quality. Having identified adverse welded joint configurations that cannot be avoided, it is generally more practical to ensure that Z35 quality steel is used in the relevant joint component that is subjected to the through-thickness strains from weld shrinkage (*the “through” material as opposed to the “incoming” material*).