

## Impact of orientation and stacinkg on knife distortion during quenching

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### ABSTRACT

The impact of stacking and knife orientation on distortion in vacuum furnace heat treatment was investigated using a sample of 900 knives made from AISI mod-A8 tool steel. The knives were distributed across 5 levels, with each level containing two tiers. Each tier held 45 knives, divided into 15 lots of 3 stacked knives each. The study aimed to analyze the distortion patterns in relation to the knives' position within the furnace and their stacking arrangement. Results revealed significant distortion in knives positioned at the bottom of the furnace, specifically in the first level (tiers 1 and 2). Notably, the knives in the middle of each stack consistently exhibited higher levels of distortion compared to those at the top or bottom of the stack. This pattern suggests that the position within both the furnace and the individual stack plays a crucial role in the degree of distortion experienced by the knives during the heat treatment process. These findings have important implications for optimizing the heat treatment process in vacuum furnaces, particularly for knife manufacturers.