
Investigation of the texture development of rolled aluminum alloy sheets during constant heating using *in situ* EBSD

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Abstract

In aluminum alloy sheets, the final texture has a major influence on, for example, formability or the so-called roping effect. Heat treatments carried out after cold rolling usually lead to the formation of new recrystallization textures. In order to better understand the formation of this texture, heating investigations with different heating rates up to a temperature of 450°C were carried out on cold-rolled sheets Al alloys. The resulting recrystallization texture was determined using *in situ* EBSD. A Zeiss Ultra55 scanning electron microscope equipped with a Kammrath&Weiss heating stage, a Thorlabs scientific camera and the Ametek OIM software were used for this purpose. With regard to nucleation, it was found for all texture components that only very few texture areas already present in the rolled structure are actually possible as nuclei for the recrystallization texture. However, it was noticed that the newly forming grains (with or without texture) at the beginning of recrystallization usually served as a kind of nucleation point, from which the grains then continued to grow in their respective orientations. This behavior was particularly noticeable with the cube component. In addition, it was found that the grain growth of the cube component appears to be greatest in relation to the other texture components during the first recrystallization phase. An influence of the heating rate on the recrystallization process was also found. On the one hand, recrystallization started earlier with a lower heating rate, on the other hand, the previously described effect of the growth advantage of the cube component compared to the other orientations seemed to decrease with a higher heating rate.

Keywords: aluminum alloy, *in situ* EBSD, recrystallization, texture

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