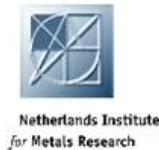


# Through-Process Texture Modeling During Sheet Production of AA6016

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# *Introduction & Motivation*

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*AA6016 (Al–Mg–Si) is used for automotive body sheet.*



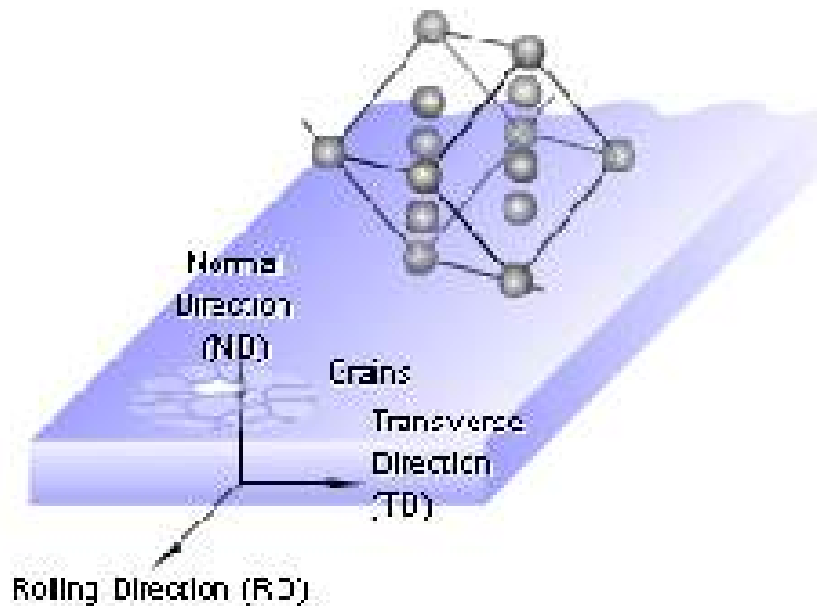
Properties:  
*good formability*  
*high strengthening potential*  
*(good corrosion resistance)*



***A proper texture control improves formability,  
roping and other mechanical properties ...***

# What means the term „texture“?

## ***Orientation distribution in a polycrystal.***



*„random“  
orientation  
distribution*

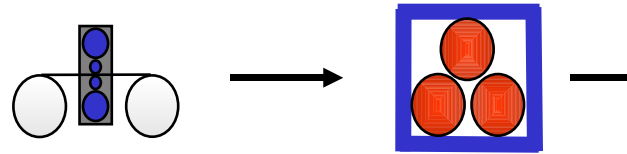
*bad  
non-random  
orientation  
distribution*



*mechanical properties*

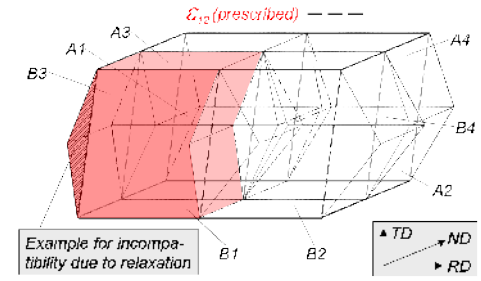
***All technical processes produce a specific texture.***

## From hot rolling ... to ... final annealing

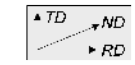


**Crystal Plasticity**

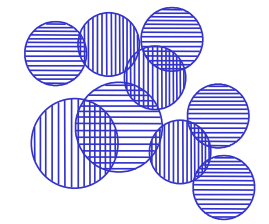
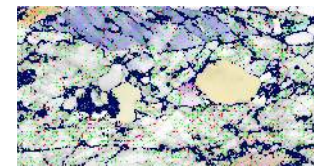
**GIA**



Example for incompatibility due to relaxation



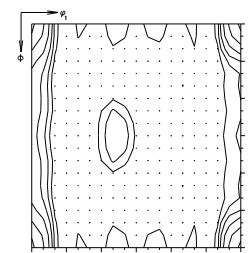
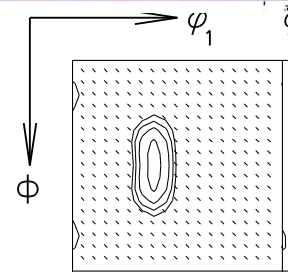
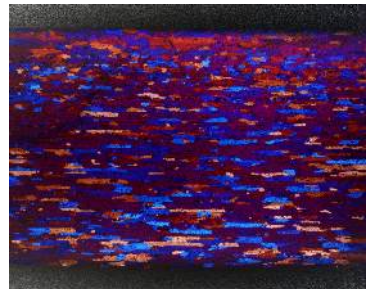
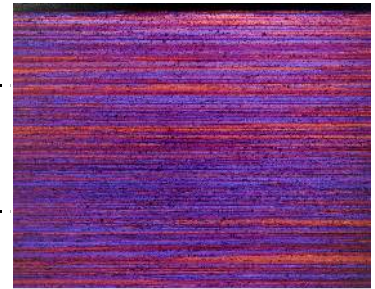
**Recrystallization**  
**ReNuc + StaRT**



Technical Process

**Cold Rolling**

**Annealing**



Physical Mechanism

**Crystal Plasticity**

**Recrystallization + Phase Transformation**

# Objectives

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- ✓ ***To simulate the microstructure and the texture evolution from hot rolling to final annealing***
- ✓ ***To reveal the essential physical mechanisms for recrystallization***
- ✓ ***To improve the mechanical properties (i.e. surface roughness) by choosing a different thermomechanical treatment***

# More detailed Info ...

*... about deformation texture and recrystallization texture modeling + results*

