## Project sheet

### Research project:
Nickel Sulphide (NiS-) induced breakage of glass: failure probability and fracture mechanics model

### Images:

![Images](image_url)

### Keywords:
nickel sulphide inclusions, spontaneous breakage, fracture mechanics, failure probability

### Researchers involved:
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### Time span:
2009 – ongoing

### Description:
Nickel-Sulfide is a mineral that contaminates the glass melt during the glass production. The delayed change of the spatial structure of the crystals is related to a volume expansion and induces high local stresses in the glass, which leads to a “spontaneous” breakage of the glass on the building after years.

For a better understanding of the NiS-induced breakage of glass, the research focuses on the fracture mechanism that leads to failure. In addition, statistical data are collected and analyzed to determine the failure probability of tempered and thermally toughened glass due to NiS-induced brakage.

### Most important publications:
- SCHNEIDER, Jens; HILCKEN, Jonas
  *Nickel Sulphide (NiS-) induced failure of glass: fracture mechanics model and verification by fracture data*
  Proceedings of the Engineered Transparency 2010

- HILCKEN, Jonas
  *Probabilistische und bruchmechanische Untersuchung Nickelsulfid-induzierter Spontanbrüche in Glas*

### Working group:
WG 2. Material characterization and material improvement
WG 3. An integrated design approach incorporating risk analysis and post-fracture performance

### Category:
Quality of Glass / Residual load-bearing capacity / Long term strength of glass / other

### Sheet compiled on:
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