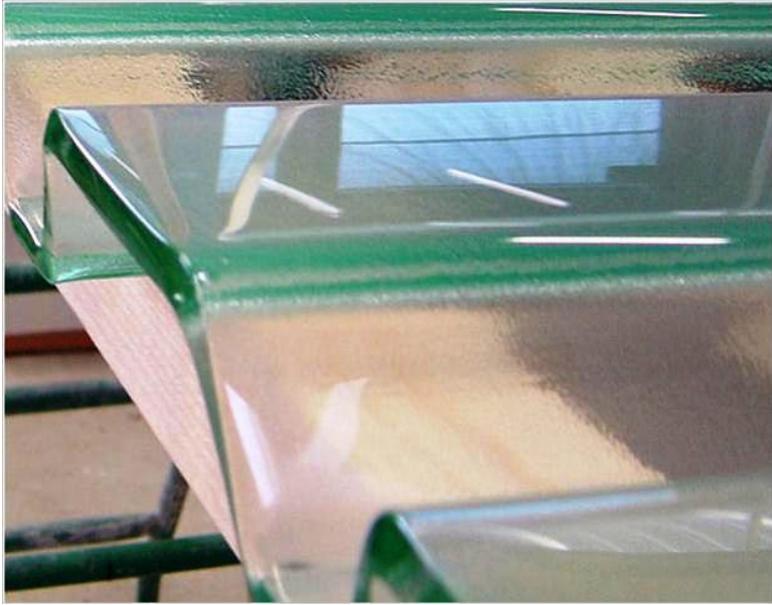
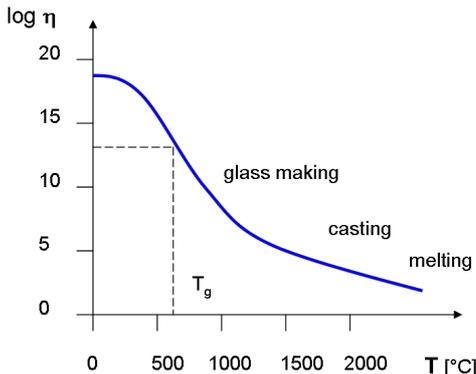


Project datasheet COST Action TU0905	
Research project :	Curved glass
Images :	
Keywords :	bent glass, curved glass viscosity, shapes
Researchers involved :	- NEUGEBAUER Jürgen
Contact details :	<a href="mailto:juergen.neugebauer@fh-joanneum.at">juergen.neugebauer@fh-joanneum.at</a>
Time span :	2003 - ongoing
Description :	<p>The process of the deformation of a flat glass pane is process with high temperatures. The procedure of glassblowing is very old. The glass is again and again brought in a furnace on a temperature of over 600°C, in order to form it by blowing to a cylinder.</p>  <p>At temperatures over the temperature of transformation of approx. 550 °C the glass becomes softer. A physical description of the procedure is possible with the viscosity. The viscosity designates the strength, which is required, in order to shift two parallel surfaces in a certain distance with a certain speed. One recognizes the meaning of the viscosity, if one regards the formation of a glass.</p> <p>A melt is a liquid and differs from the solid state by the fact that the bonds between the molecule particles are missing. If individual particles move, then the bonds of the molecule particles must be blown up. The energy required for it is applied by thermal. The higher the temperature is the more bonds are blasted open.</p>

## Inventory of existing research

	<p>The viscosity of glass at room temperature with <math>\eta = 10^{19}</math> Poise is very high, and it is a brittle material. With rising temperature the viscosity <math>\eta</math> decreases first smaller, then more strongly and finally again smaller. At a temperature from approximately 1400 to 1500 °C the fusing temperature and it are appropriate are present it for viscosity of <math>10^2</math>. In the comparison water has a viscosity at room temperature of approx. <math>10^{-2}</math> Poise. The entire course of the curve exhibits a turning point, which is with glass with approx. 550°C and with a viscosity of <math>\eta = 10^{13}</math>. In front of flames can a glass with a viscosity from <math>10^6</math> to <math>10^9</math> Poise by glassblower be worked on. It takes place by a temperature of approx. 700 to 850°C. At increasing temperature the viscosity decreases, and the glass can be deformed ever more. The system has more and more energy to blow up the bonds between the molecule particles.</p> <p>The basic product of all bend glasses is a float glass. A thermal transformation of glass is on the one hand pure bending at a temperature of approx. 600°C and on the other hand a transformation of glass mass at a higher temperature up to approx. 800°C. The basic principle in most cases is that the dead weight of the glass causes a deformation of the panes. The glass becomes soft and deforms to it the desired form.</p>
Most important publications :	<ul style="list-style-type: none"> <li>- NEUGEBAUER, Jürgen <i>Geometrical transformation of glass</i> Glass Performance Days 2007 - The 10th International Conference on Architectural and Automotive Glass, Tampere Finland, 2007</li> </ul>
Working group :	WG 4. Novel glass assemblies
Task Group :	TG11. Architectural geometries
Sheet compiled on :	[ 2012/09/18 ]