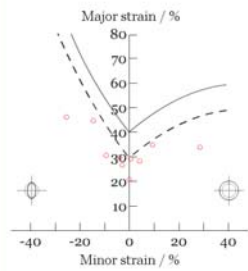


steeluniversity.org

steel applications & products

**Construction:** Low and high rise buildings, housing, modular



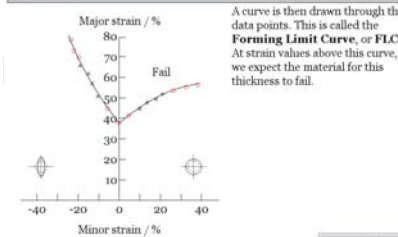
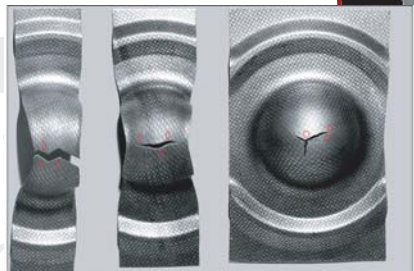
The strains are plotted on the **forming limit diagram** at different points across the surface can be calculated using circle grid analysis. In this example, all of the points on the FLD fall within the 'safe' area, and no failure (i.e. splitting or necking) is expected.

Next

One role-play exercise challenges the user to reduce the mass of a car door panel by 25% without sacrificing 'performance', i.e. maintaining dent resistance, formability, joinability and corrosion resistance.

Users can perform virtual experiments with different sheet steels before recommending a suitable grade, thickness and coating from a database.

In order to achieve a solution, new steel alloys must often be developed - this links directly to the processing-based modules.



A curve is then drawn through the data points. This is called the **Forming Limit Curve, or FLC**. At strain values above this curve, we expect the material for this thickness to fail.

Next

Sample 1

Thickness,  $t$  / mm

Die radius,  $r$  / mm

Yield stress,  $\sigma_y$  / MPa

Springback ratio,  $K = 0.923$

Sample 2

Thickness,  $t$  / mm

Die radius,  $r$  / mm

Yield stress,  $\sigma_y$  / MPa

Springback ratio,  $K = 0.832$

Steel has by far the widest range of applications of any material. steeluniversity.org will allow students to explore the use of steel in automotive, construction, packaging, power generation and transmission industries.

An important learning outcomes is to recognize that many modern steels are specially developed for demanding new applications, for which a careful balance between several properties must be achieved.

Many of the exercises require the user to apply knowledge from the relevant areas of steel processing and science.

For further information, please contact:

Dr David Naylor,  
 Director, steeluniversity.org  
 Swinden Technology Centre  
 Moorgate, Rotherham S60 3AR, UK  
 Tel: +44 (0)1709 825190  
 Fax: +44 (0)1709 825460  
 Email: naylor@iisi.be  
 Web: www.steeluniversity.org



international iron & steel institute

