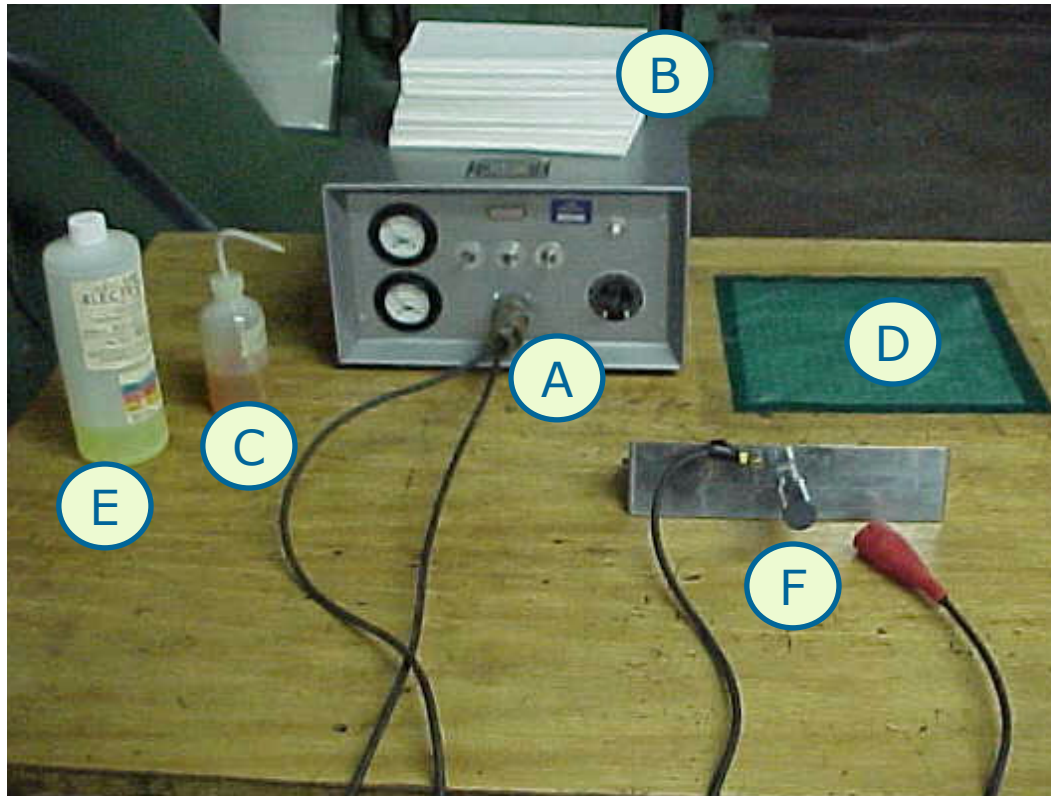


# Circle Grid Tutorial

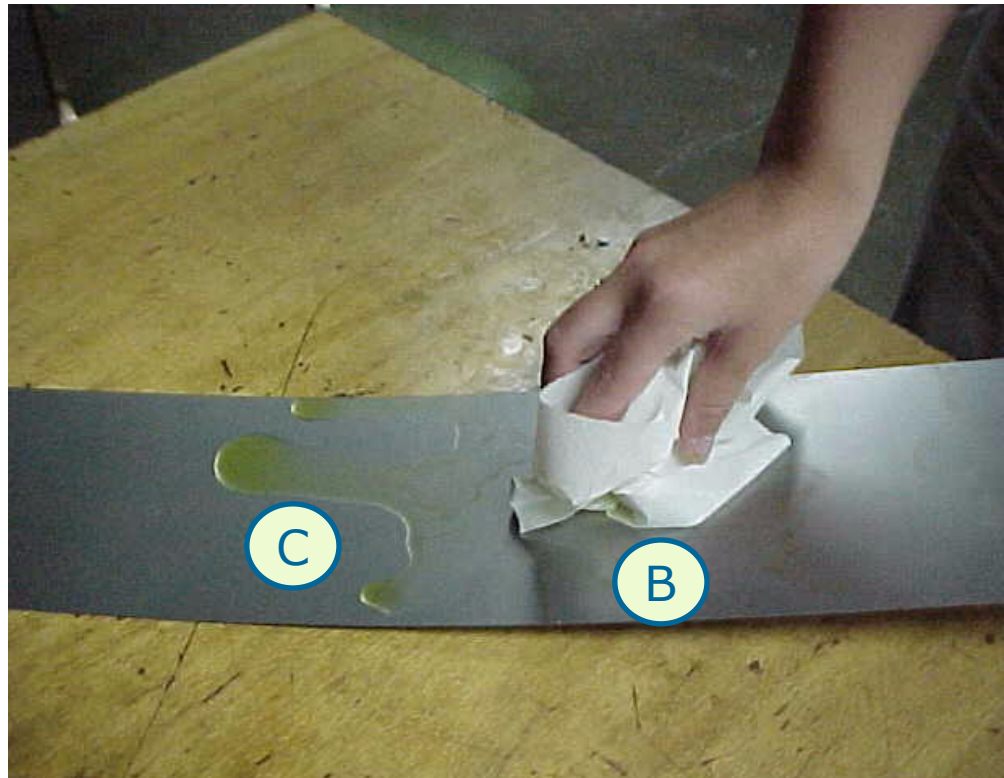
*Courtesy of Professor William J. Riffe, Kettering University, Flint MI*



## **EQUIPMENT**

- Power Source
- Paper Towels
- Cleaning Fluid
- Grid Template
- Electrolyte
- Etching Roller

# Circle Grid Tutorial

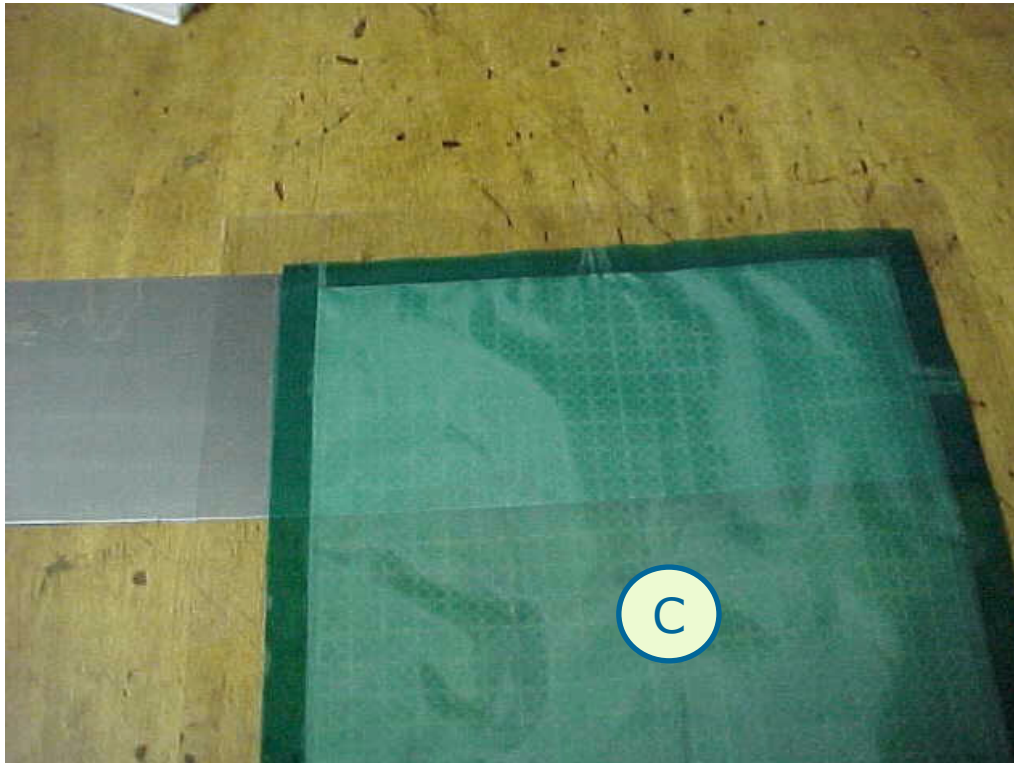


## **CLEANING**

A cleaning solution [C] is applied to remove mill oil

Paper towels [B] are used to clean and then dry the material

# Circle Grid Tutorial

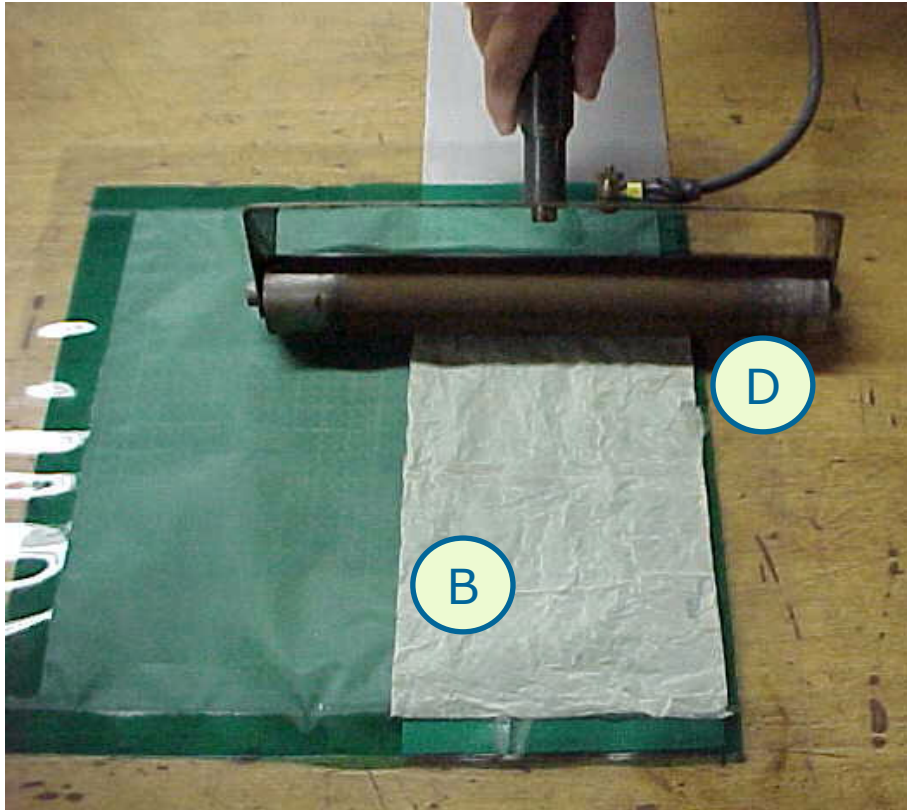


## **GRID TEMPLATE**

The grid template [C] is laid over the area to be gridded

It is not necessary to grid the entire blank. Just the area being studied

# Circle Grid Tutorial

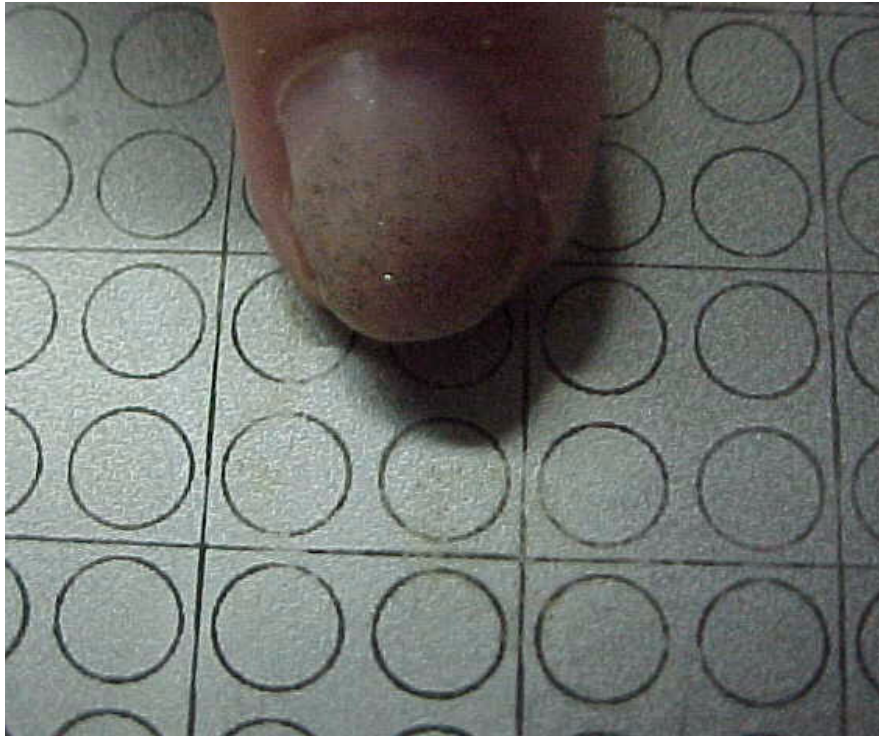


## **APPLYING GRIDS**

Paper towels [B] soaked in electrolyte [E] are placed over the grid template.

The etching roller [D], connected to the power source [A], is rolled over the towels

# Circle Grid Tutorial



## **RESULTING GRID**

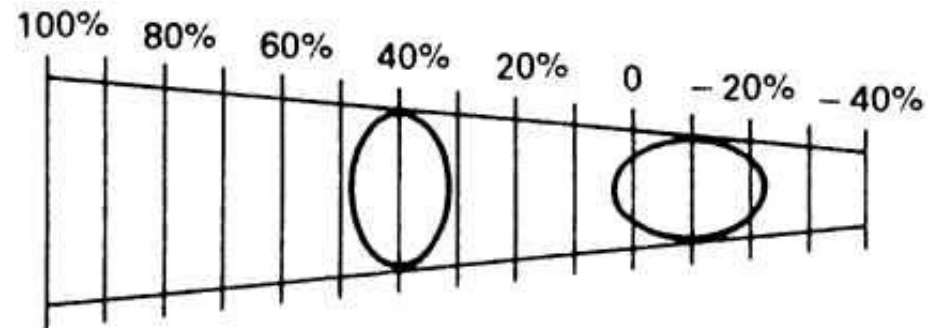
When applied correctly, the proper electrolyte and voltage will produce well defined circles etched into the surface of the material. The blank is now ready to be deformed.

# Circle Grid Tutorial

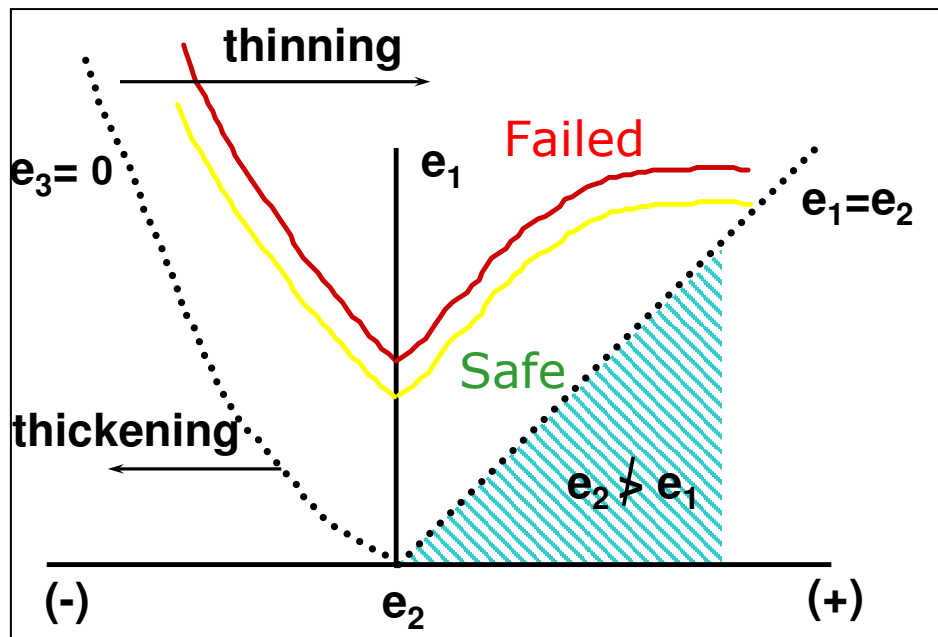


## **DEFORMED GRID**

The deformed circles can now be measured.



# Circle Grid Tutorial



When the strain results are plotted on a forming limit diagram (FLD), the forming severity can be assessed relative to its proximity to failure.