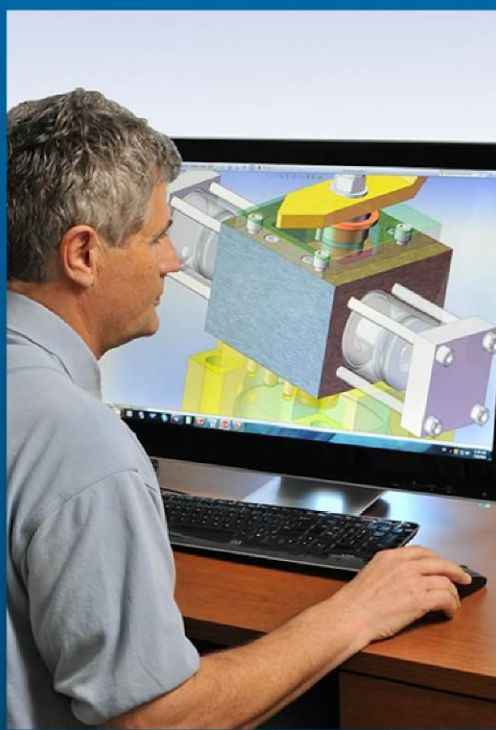
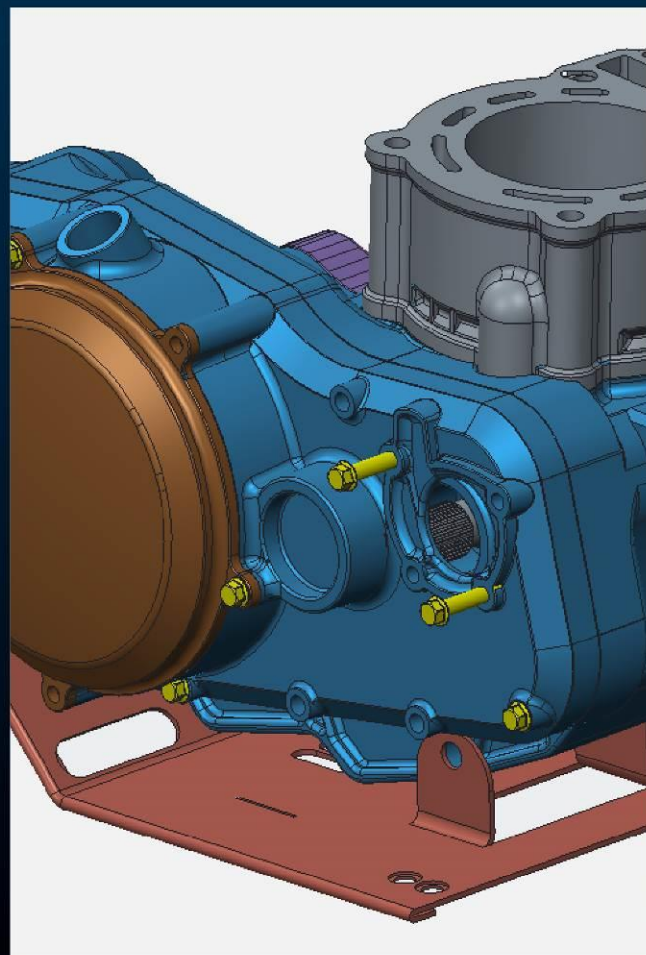
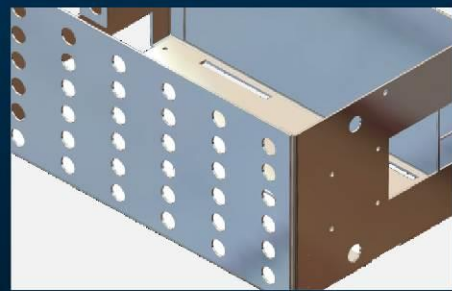




DFMPro
A Geometric Product



A DEFINITIVE GUIDE TO **DESIGN FOR MANUFACTURING SUCCESS**



Sheet Metal Design Guidelines

Curl and Lance Design Guidelines

Issue X, May 2015

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Welcome to another issue of the DFM Guidebook. We highly appreciate your feedback for our previous issues. Please continue sending us your comments, suggestions and ideas for subsequent issues.

If you have any feedback or questions on DFM guidebook, please write to us at info@dfmpro.com

Happy reading!

Rahul Rajadhyaksha
Senior Product Manager
Geometric Limited

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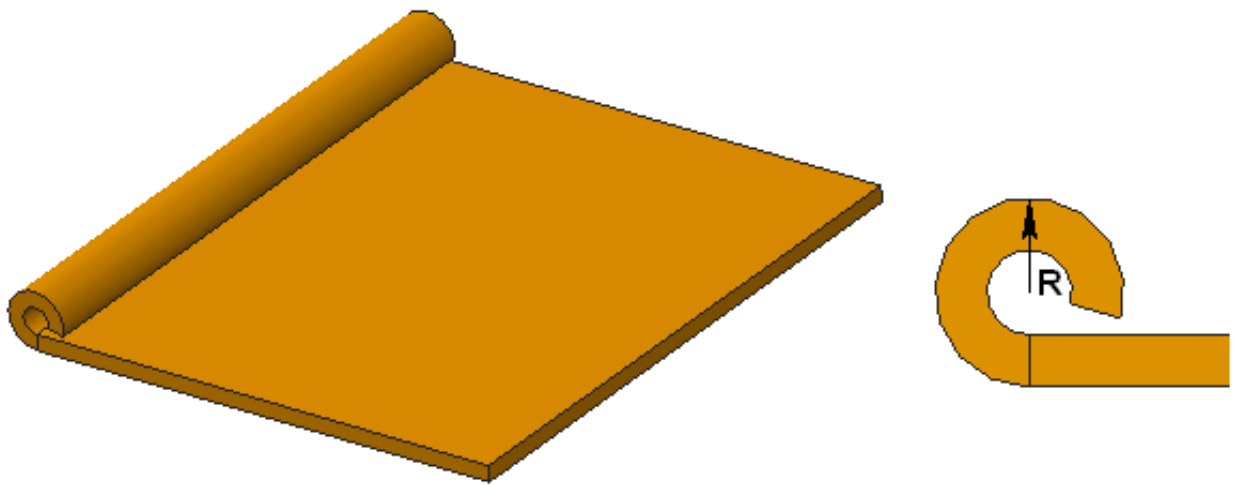
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Curl Radius

Curling is the process of forming the sheet metal flange into a rolled shape. Curling strengthens the edges and provides smoothness to the surface. It is commonly used as a means of joining two components.

Curls are often added to avoid sharp edges and make parts safer for handling and use.

It is recommended that the outside radius of curl should be minimum 2X of the material thickness.

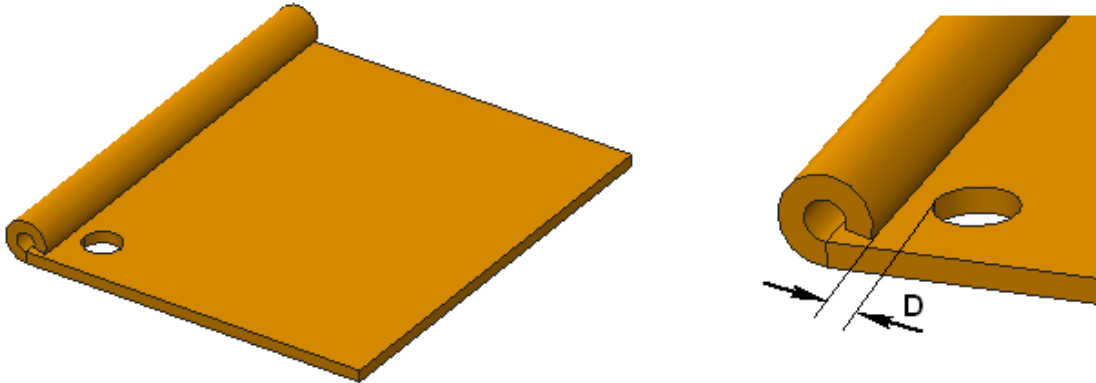


t = Sheet metal thickness

R = Outside radius

Minimum Distance between Curl and Hole

It is recommended that the minimum distance between a curl and the edge of a hole should be sum of curl radius and material thickness.



t = Sheet metal thickness

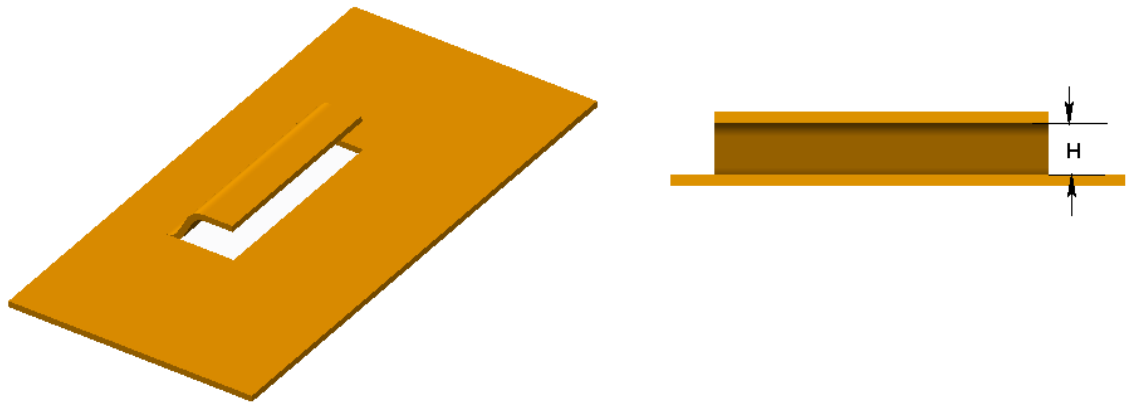
D = Distance

Minimum Depth of Lance

Lancing is a piercing operation in which the work piece is sheared and bent with strike of a die. In this process there is no material removal however it only modifies the geometry. Lancing can be used to make partial contours and free up material for other operations.

Lancing is used to make tabs, vents and louvers.

It is recommended that the minimum depth of lance should be 2X the material thickness.



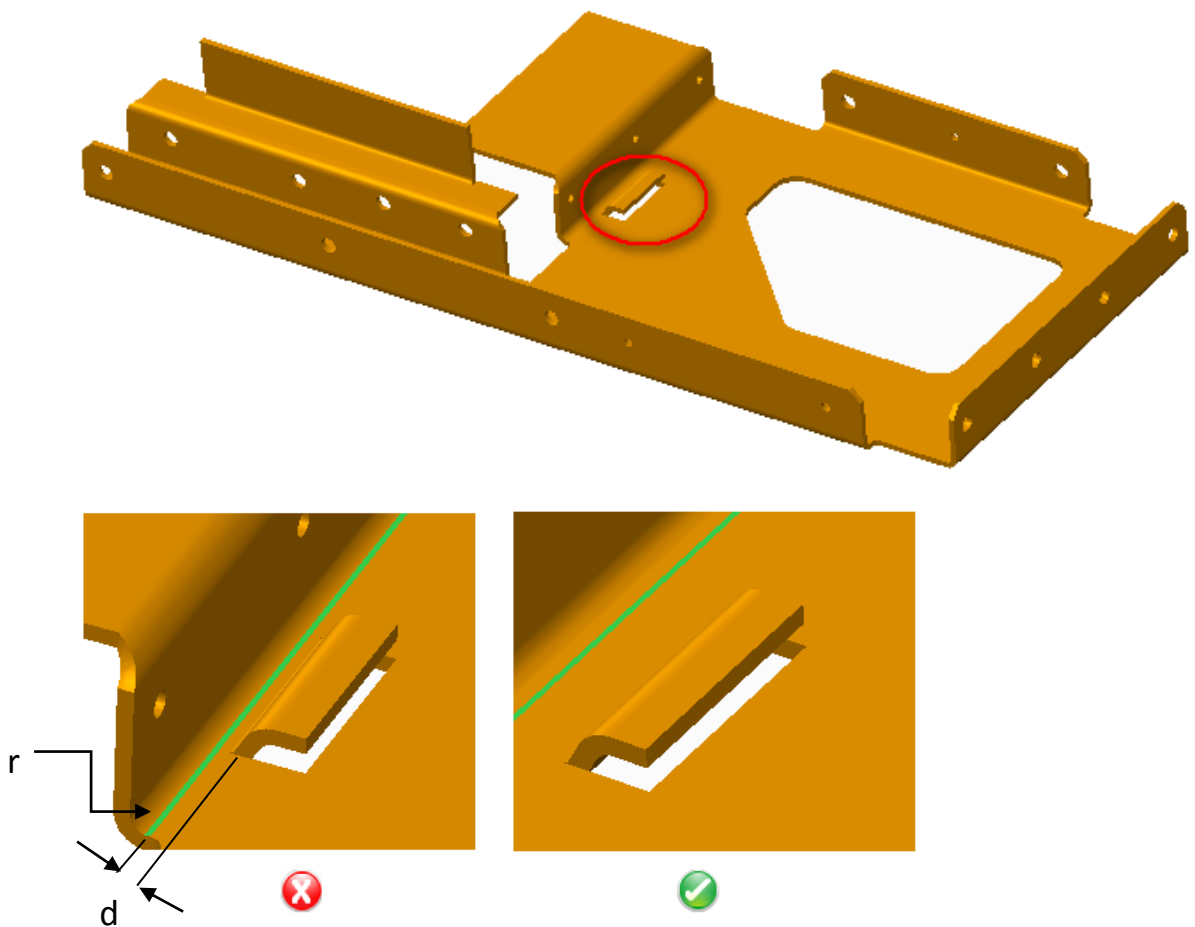
t = Sheet metal thickness

H = Depth of lance

Minimum Distance from Bend to Lance

During lancing operation a sufficient degree of clearance should be given around the lance feature and bend.

It is recommended that minimum distance between lance and bend should be $3X$ the material thickness plus bend radius.



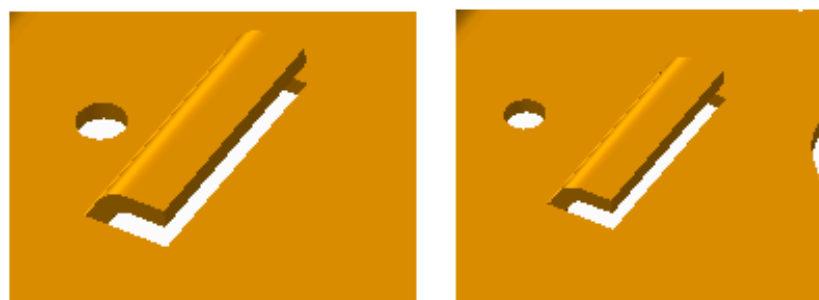
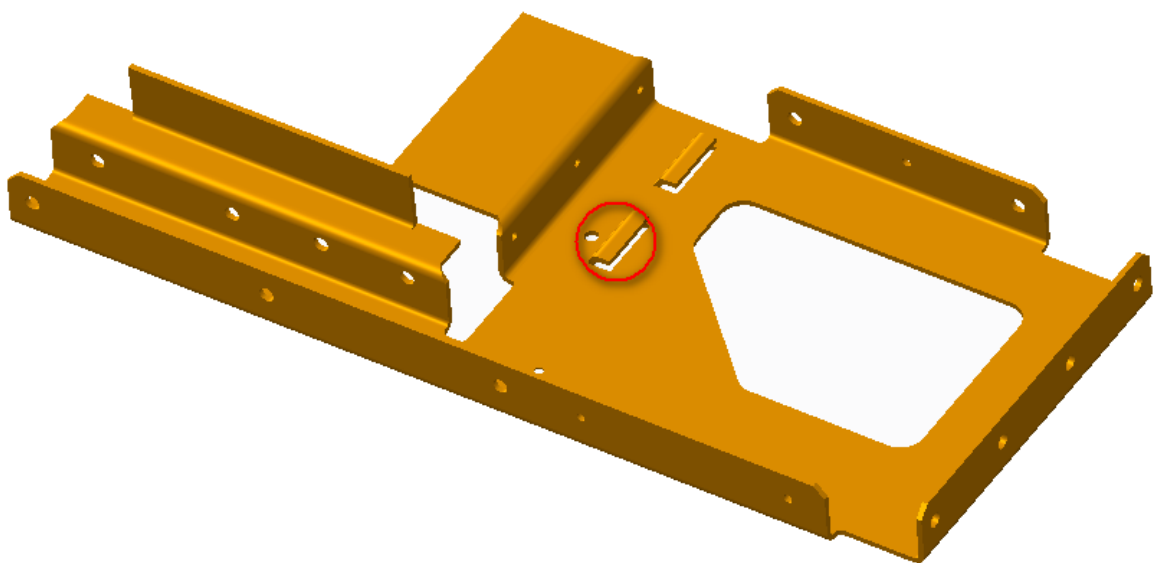
t = Sheet metal thickness

r = Inside bend radius

Minimum Distance from Hole to Lance

During lancing operation we need to maintain sufficient degree of clearance around the lance feature.

It is recommended that the distance between lance and hole should be $3X$ the material thickness.

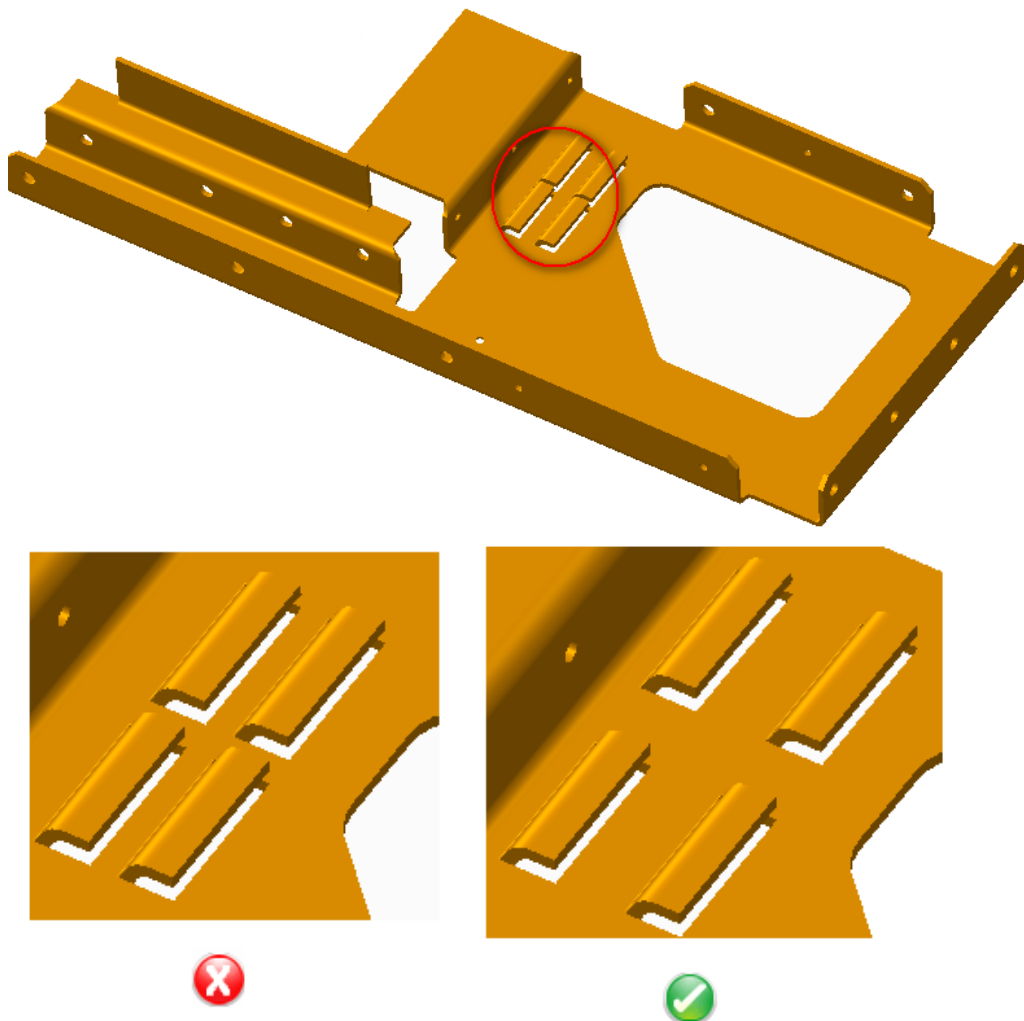


t = Sheet metal thickness

Minimum Spacing between Lances

During lancing operation sufficient degree of clearance should be maintained around the lance feature as the punch and die will need some degree of clearance around the feature in order to hold down the work piece during operation. If another lance is placed inside this working envelope it will be crushed by the punch and die, potentially damaging the work piece and tools.

It is recommended to maintain sufficient clearance between two lance features by considering die and punch clearance allowance.



t = Sheet metal thickness