

# Concurrent System Design Harvard Case Solution & Analysis


TheCaseSolutions.com

Whenever FEM conditions are often neglected parts of product cost, process design and throughput manufacturing environment, it is essential to apply simulation in the design phase.

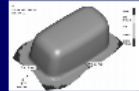
Computer Aided Engineering refers to a variety of computer-aided analytical tools and services. This includes simulation of stress, deflection, vibration, fluid flow, distribution, temperature distribution.

Analyzed both 1200 stamped sheet metal DC05. The main process of shaping is implemented in one operation in order to avoid potential defects that may occur during a multi-stage shaping.


Setting tools to simulate stamping process bathtub 1200 is shown in Figure



The final shape of a bathtub obtained from the FEM simulation taking into account the optimal braking forces and the position and length of drawbead shown in figure.



In the case of great thickness values obtained are values for optimal force, moment and length of drawbead recorded to 70% and 20%.




As concluded using the three element method the resulting shape of the bathtub is free from defects. It is sure to meet the extruded prior to the forming operation.



The wrinkles disappear when the drawbead pressure is increased from 210N to 215N, according to the simulation results.



As concluded using the three element method the resulting shape of the bathtub is free from defects. It is sure to meet the extruded prior to the forming operation.



The final shape of a bathtub obtained from the FEM simulation taking into account the optimal braking forces and the position and length of drawbead shown in figure.



THANK YOU FOR ATTENTION

Copyright © 2015 by The Case Solutions, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of The Case Solutions, Inc.

FIGURE 1

# Concurrent System Design Harvard Case Solution & Analysis


TheCaseSolutions.com

However, FEM conditions are often neglected parts of product cost prediction and manufacturing environment. It is essential to apply conditions in the design phase.

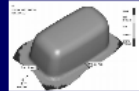
Computer Aided Engineering refers to a variety of computer-aided analytical tools and methods. The most common include: finite element analysis, stress analysis, vibration analysis, fluid dynamics, optimization, simulation, distribution, temperature distribution.

Analyzed both 1200 stamped sheet metal DC05. The main process of shaping is implemented in one operation in order to avoid potential defects that may occur during a multi-stage shaping.


Setting tools to simulate stamping process bathtub 1200 is shown in Figure



The final shape of a bathtub obtained from the FEM simulation taking into account the optimal braking forces and the position and length of drawbead shown in figure.



In the case of great thickness values obtained are within the design range, normal compliance. 0.05 and recorded in 100.000 20%.

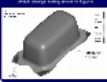


As concluded using the three element method the thickness is free from defects. It is quite in line with the extruded prior to the forming operation.



The wrinkles disappear when the drawbead pressure is increased from 210N to 215N, according to the simulation results.

As concluded using the three element method the thickness is free from defects. It is quite in line with the extruded prior to the forming operation.



The final shape of a bathtub obtained from the FEM simulation taking into account the optimal braking forces and the position and length of drawbead shown in figure.



THANK YOU FOR ATTENTION

Copyright © 2015 by The Case Solutions, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of The Case Solutions, Inc.

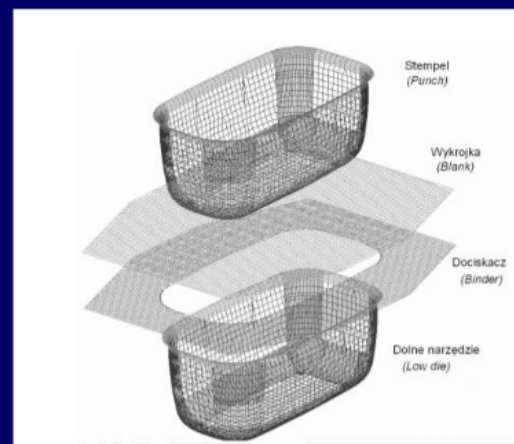
FIGURE 1

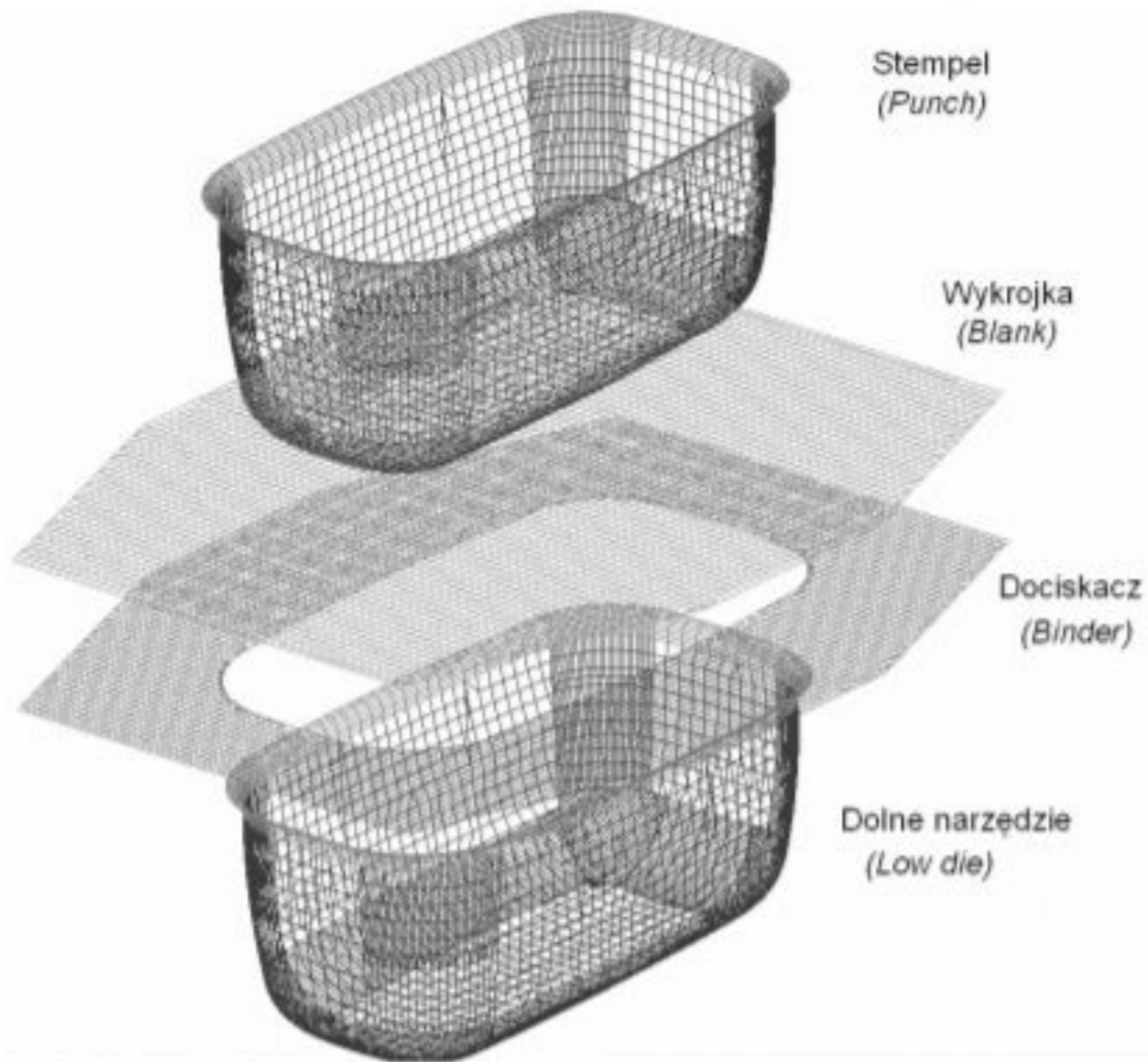
Nowadays, FEM simulations are often integrated parts of product and process design in an integrated manufacturing environment. It is essential to apply simulation in the design phase.

Computer Aided Engineering refers to a system of computerized analytical tools that permit finite element analysis of effective stresses, equivalent plastic strains, deformation, thickness distribution, temperature distribution.

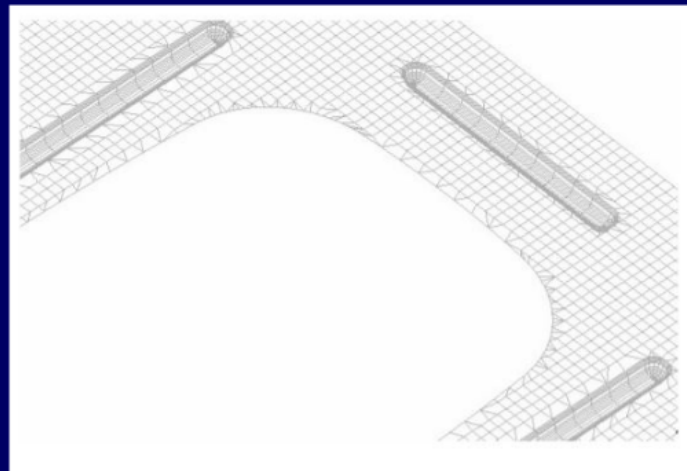
Analyzed bath 1200 stamped sheet metal DC05. The main process of shaping is implemented in one operation in order to avoid potential defects that may occur during a multi-stage shaping.

Setting tools to simulate stamping process bathtub 1200 is shown in Figure

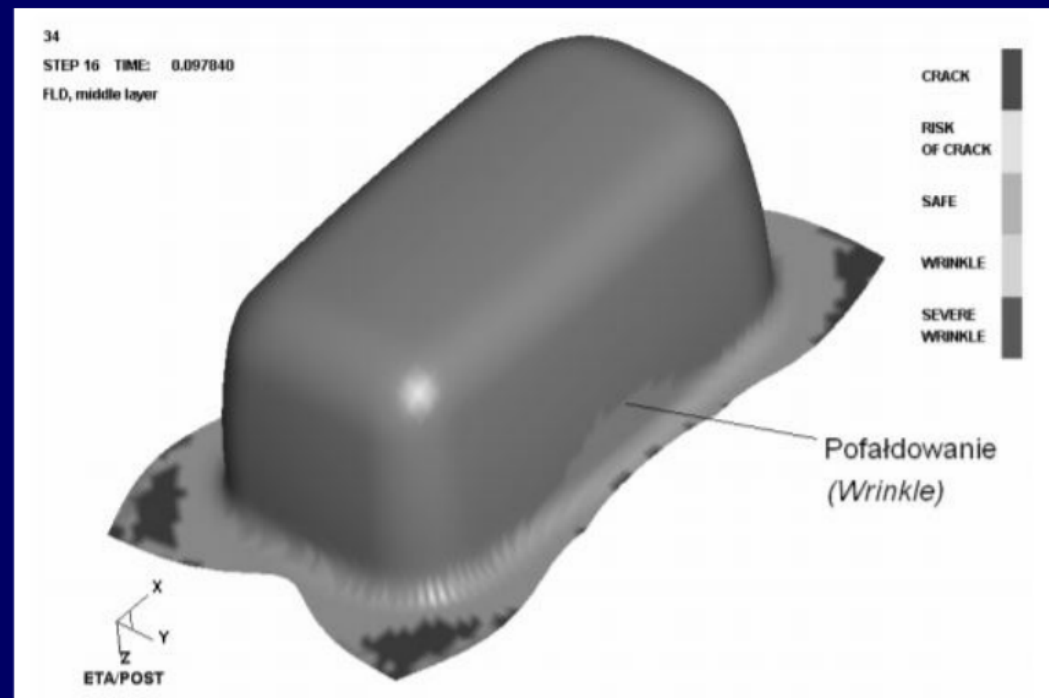




In the finite element simulations, the sheet metal that is pulled through the drawbead during drawing must be modeled by very small elements to reflect the effect of the bending deformation of the sheet metal around the drawbead, resulting in a large amount of computation time. In order to eliminate this problem, an equivalent drawbead model, was adopted to replace the full scale physical modeling of the drawbead in the finite element simulations



A clamping force of 2.1 MN exerted by the blank holder and a coefficient of friction of 0.125 were assumed for the initial die design. The final shape that results from which design being show in figure.



The wrinkles disappear when the blank holder pressure is increased from 2.1 MN to 4.0 MN, according to the simulation results.