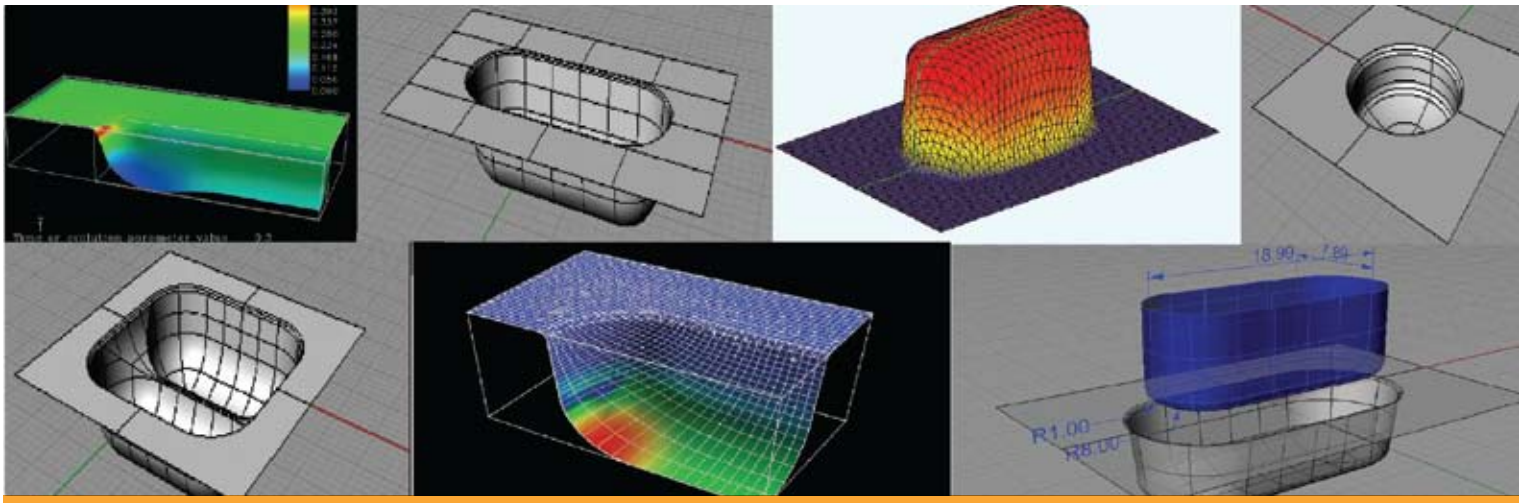


Pentapharm® BlisterPro™

Predicting Blister Moisture Vapor Transmission Rates

Do you need to protect your pharmaceutical product against moisture? Cavity shape is an important factor. With Pentapharm® BlisterPro™ software, you can design the optimal blisters for your product. At kp, we believe in meeting the needs of our pharmaceutical clients comprehensively. That's why we offer BlisterPro™ as part of a complete package of films and support. At kp, we deliver.

In many cases, a moisture vapor transmission rate for a drug product from stability data has already been defined. With these data, kp can model the barrier performance of the cavity and predict the moisture vapor transmission rate of a cavity in, for example, units of mg/blister/day. This often helps determine if a package can meet the requirements either outlined in regulatory literature or by stability testing.

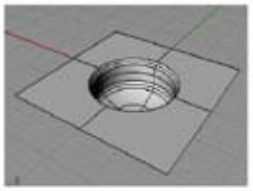
Since changes to geometry can have a large effect on performance, Pentapharm® BlisterPro™ works well to check production tool designs versus the results given by stability tools. This provides package engineers with a better level of detail in order to make a more informed decision.

"Twenty Count" Tablet

0.28 mm^3

0.027 mg/day - experiment

0.036 mg/day - Pentapharm® BlisterPro™

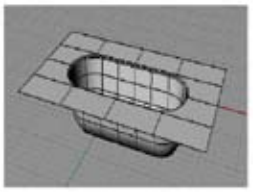


"Size One" Capsule

1.00 mm^3

0.148 mg/day - experiment

0.142 mg/day - Pentapharm® BlisterPro™

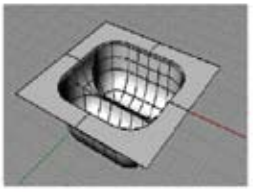


"Double" Capsule

4.02 mm^3

0.313 mg/day - experiment

0.311 mg/day - Pentapharm® BlisterPro™

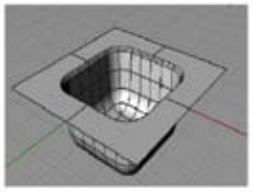


"Square" Tablet

2.09 mm^3

0.195 mg/day - experiment

0.194 mg/day - Pentapharm® BlisterPro™

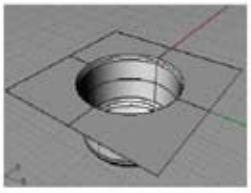


"Round" Tablet

1.10 mm^3

0.101 mg/day - experiment

0.111 mg/day - Pentapharm® BlisterPro™



kp performed testing for Pentapharm® ACLAR® 200 S03 film made on 5 different tool shapes in order to provide information on both the error of prediction and to gain further confidence in the model. All blisters produced in this study used 5-mil vinyl skins and a 2-mil ACLAR® layer. The blisters ran with standard pressure-only conditions on a Körber Medipak CP-2.

Very often Pentapharm® BlisterPro™ demonstrates an accuracy of prediction to within approximately 10% of experimental data.