



THERMOFORMING AND BLOW MOLDING SIMULATION

WITH PAM-FORM FOR PLASTICS

KEY BENEFITS

- Predict forming issues earlier in the production cycle
- Optimize the thermoforming process and tool design
- Improve material selection
- Foster innovation
- Overall cost savings and reduced time to market

TYPICAL APPLICATIONS

- Food & drink packaging
- Pharmaceutical and electronics articles
- Automotive interior panels
- Appliance components
- Toys

PAM-FORM is the pioneering virtual manufacturing software dedicated to non-metallic forming processes, developed through industrial partnerships and projects in various fields such as automotive, aerospace and consumer goods.

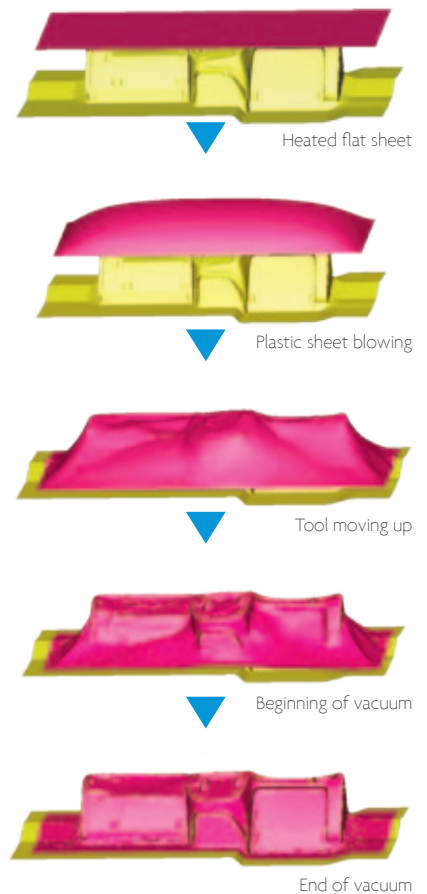
PAM-FORM for Plastics extends the thermoforming simulation frontier from a simple formability evaluation to a complete virtual thermoforming solution for industrial use. It provides unsurpassed productivity gains and flexibility for formability evaluation and process validation.

PAM-FORM simulates the entire forming process, making it possible to prove thermoforming tools and processes on computer, before any hardware is built.

With PAM-FORM, you can produce validated results (wrinkles, splits if any, final thickness...), which up until now could be obtained only by actual tryout, thus producing all answers

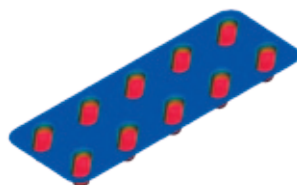
Automotive application example:

Dashboard Thermoforming



Other industrial applications include:

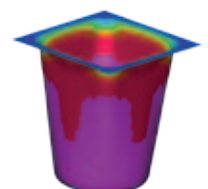
Pharmaceutical blister



Plastic Bottles



Yogurt cup



required to build hard tooling with confidence. By carrying out these simulations, through successive refinements of forming conditions or geometry, your hard tools will require only fine-tuning before a successful production run.

PAM-FORM enables you diagnosing and solving manufacturing problems in your design, as well as correcting and preventing wrinkling and excessive thinning while improving your tooling.

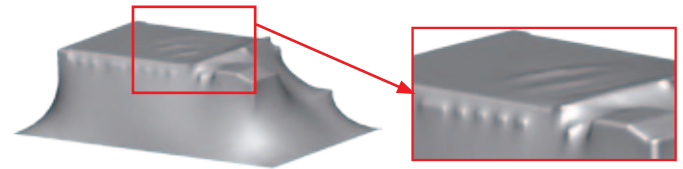
PAM-FORM provides the designers and process engineers with the following help:

- **Correct:** analyze an existing tooling to improve design and process, reduce the scrap rate and meet product design criteria.
- **Prevent:** analyze a new design to predict design flaws before tooling takes place, avoiding costly formability problems and time and money spent re-tooling.

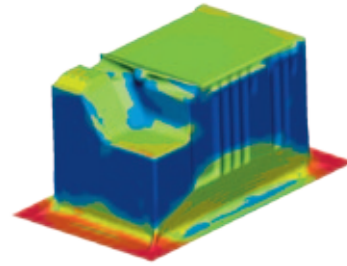
PAM-FORM is fully compatible with ESI's simulation software portfolio for virtual manufacturing and performance testing, hence, keeping the manufacturing history of the calculation run, you can make use of the results for further analysis. For instance, while performing thermoforming simulation, thickness results can be kept for static and/or dynamic loading application for "as built" design analysis.

Typical results on a fridge innerliner:

Wrinkling



Thickness distribution



Shape distortion



For more information, visit: www.esi-group.com/pam-form

ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in virtual prototyping that takes into account the physics of materials. ESI has developed an extensive suite of coherent, industry-oriented applications to realistically simulate a product's behavior during testing, to fine-tune manufacturing processes in accordance with desired product performance, and to evaluate the environment's impact on performance. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping, thus eliminating the need for physical prototypes during product development. The company employs over 750 high-level specialists worldwide covering more than 30 countries. ESI Group is listed in compartment C of NYSE Euronext Paris. For further information, visit www.esi-group.com.



info@esi-group.com

ESI Group
Headquarters
 100-102 Avenue de Suffren
 75015 Paris
FRANCE
 T. +33 (0)1 53 65 14 14
 F. +33 (0)1 53 65 14 12

EUROPE

BENELUX & SCANDINAVIA

ESI Group Netherlands
 Radex Innovation Centre
 room 4.57
 Rotterdamseweg 183 C
 2629 HD Delft
 The Netherlands
 T. +31 (0)15 268 2501
 F. +31 (0)15 268 2514

CZECH REPUBLIC & EASTERN EUROPE

MECAS ESI
 Brojova 2113/16
 326 00 Pilsen
 Czech Republic
 T. +420 377 432 931
 F. +420 377 432 930

FRANCE

ESI France
 Parc d'Affaires Silic
 99, rue des Solets - BP
 8012
 94513 Rungis cedex
 France
 T. +33 (0)1 49 78 28 00
 F. +33 (0)1 46 87 72 02

GERMANY

ESI GmbH
 Mergenthalerallee 15-21
 D-65760 Eschborn
 Germany
 T. +49 (0)6196 9583 0
 F. +49 (0)6196 9583 111

ITALY

ESI Italia
 Via San Donato 191
 40127 Bologna
 Italy
 T. +39 0516335577
 T. +39 0516335578
 F. +39 0516335601

SPAIN

ESI Group Hispania
 Parque Empresarial Arroyo
 de la Vega
 C/ Francisca Delgado,
 11 - planta 2ª
 28108 Alcobendas (Madrid)
 Spain
 T. +34 91 484 02 56
 F. +34 91 484 02 55

SWITZERLAND

Calcom ESI
 Parc Scientifique
 EPFL / PSE-A
 1015 Lausanne-EPFL
 Switzerland
 T. +41 21 693 2918
 F. +41 21 693 4740

UNITED KINGDOM

ESI UK
 16 Morston Court,
 Kingswood Lakeside,
 Cannock, WS11 8JB
 United Kingdom
 T. +44 (0) 1543397900
 F. +44 (0) 1543504898

AMERICAS

USA

ESI North America
 32605 W 12 Mile Road
 Suite 350
 Farmington Hills, MI
 48334-3379
 USA
 T. +1 (248) 381-8040
 F. +1 (248) 381-8998

USA

ESI North America
 6767 Old Madison Pike
 Suite 600
 Huntsville, AL 35806
 USA
 T. +1 (256) 713-4700
 F. +1 (256) 713-4799

SOUTH AMERICA

ESI South America
 Av. Pedrosa de Morais,
 1619 cj.312
 São Paulo
 SP CEP 05419-001
 Brazil
 T./F. +55 (011) 3031-6221

ASIA

CHINA

ESI China
 Unit 1006-1008,
 Metropolis Tower
 No. 2 Haidiandongsanjie,
 Haiclan District,
 Beijing, 100080
 China
 T. +86 (10)-65544907/8/9
 F. +86 (10)-65544911

INDIA

ESI India
 Indrakrupa #17, 100 feet
 ring road
 3rd phase, 6th block,
 Banashankari 3rd stage
 Bangalore 560 085
 India
 T. +91 80 4017 4747
 F. +91 80 4017 4705

JAPAN

ESI Japan
 5F and 16F Shinjuku Green
 Tower Bldg. 6-14-1,
 Nishi-Shinjuku
 Shinjuku-ku, Tokyo 160-0023
 Japan
 T. +81 3 6381 8490 / 8494
 F. +81 3 6381 8488 / 8489

KOREA

Hankook ESI
 157-033, 5F MISUNG
 bldg., 660-6,
 Deungchon-3Dong,
 Gangseo-ku,
 Seoul
 South Korea
 T. +82 2 3660 4500
 F. +82 2 3662 0084

SOUTH-EAST ASIA

ESI Group South-East Asia
 12, Jalan Dato Haji Harun,
 Taman Taynton, Cheras
 56000 Kuala Lumpur
 Malaysia
 T. +60 (12) 6181014