

SULZER

ecopaCC™

Revolutionary adhesive packaging

Tobias Bodenmüller, Thomas Zacharias



SULZER CONFIDENTIAL

Sulzer Divisions

Overview

			
PUMPS EQUIPMENT	ROTATING EQUIPMENT SERVICES	CHEMTECH	APPLICATOR SYSTEMS
Pump technology and solutions	Service solutions for rotating equipment	Separation and mixing technology and associated services	Systems for liquid applications



Agenda

- The issue
- Product overview
- Foil development
- ecopaCC™ – Simulation Landscape
- Multilayer Film – Drop Test Simulation

ecopaCC™

The issue

Adhesive applications gain substantially more importance in todays business environment.

- Composite materials in automotive, naval, aeronautic renewable energy.
- New technologies and processes in bonding, sealing, coating, a.s.o.
- Focus on protecting (damping, UV, temperature) in building and construction industry.



Beside the positive effects on the business this trend also leads to ...

- more packaging **waste**
- **negative** ecological footprint
- higher disposal **costs**
- **additional** warehousing
- **increased** transportation costs



The issue

International reactions

Plastic packaging tax <https://www.gov.uk>

Released 11 March 2020

The plastic packaging tax will take effect from April 2022 and will apply to plastic packaging produced in, or imported into the UK that does not contain at least 30% recycled plastic.

The Government has also launched a consultation on the design and implementation of the tax, which will run until 20 May 2020.

200 £ / Ton 

Europäische Union <https://www.spiegel.de>

Plastiksteuer soll kommendes Jahr 5,7 Milliarden Euro bringen

Ab 2021 will die Europäische Union eine Abgabe von 80 Cent je Kilogramm unrecyceltem Plastikmüll fordern. Das soll Staaten zur Plastikvermeidung anleiten - und den EU-Haushalt aufbessern.

Plan 2021: 800 €/ Ton 

23.07.2020, 21.09 Uhr


Bericht: «Preisschild» für CO2 rückt näher <https://www.welt.de>

Im Tauziehen um die Klimaschutzpolitik zeichnet sich einem Zeitungsbericht zufolge in der grossen Koalition ein Konsens ab. Wer in Deutschland die Atmosphäre durch Autofahren, Heizen oder Landwirtschaft mit dem Treibhausgas CO2 verschmutzt, soll künftig zahlen müssen, wie die «Frankfurter Allgemeine Sonntagszeitung» berichtete.



2020: 30€ /Ton
Future: 100 – 200 € /Ton 

<https://www.calrecycle.ca.gov>

 CALIFORNIA → Penalties/fines on rigid plastic packagings, restrictions on bidding for civil projects

Rising costs for

- the use of plastic
- emissions of CO₂

The issue

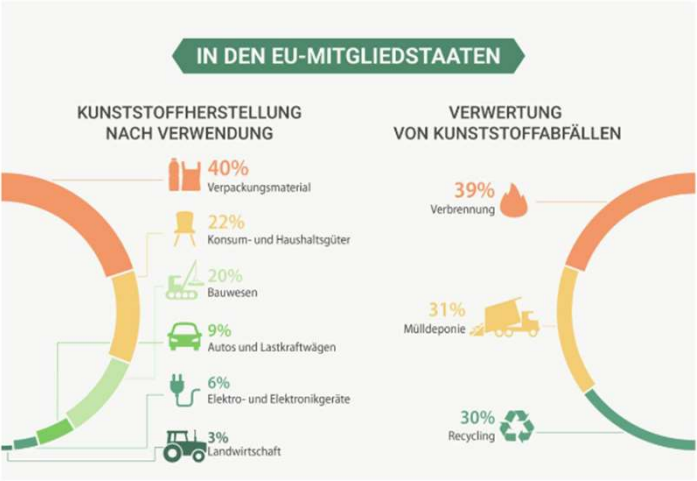
Legislation

<https://ec.europa.eu>

EU TARGETs:
 recycling of 75% of waste
 reduce landfill to max of 10%
 by 2030




National laws still existing “Verpackungsgesetz” Germany
 valid since 1.1.2019



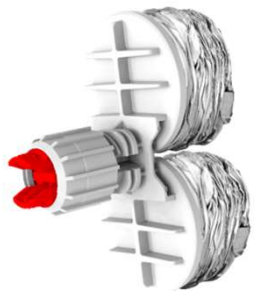
Eurostat (Daten aus 2015)

Materialgruppe: Kunststoff-Verpackungen				
1	2	3	4	
Materialfraktionen	Frakt.-Nr. / Sorten-Nr.	Gutmaterialbeschreibung	Ausschluss	W
Folien-Fraktion	310	Gebrauchte, restentleerte, systemverträgliche Artikel aus KS-Folie, Fläche > DIN A4, wie z.B. Beutel, Tragetaschen und Schrumpffolien, inkl. Nebenbestandteilen wie Etiketten etc.	Ausschluss von Aluminium-bedampften Kunststoffen	LD An
PP-Fraktion	324	Gebrauchte, restentleerte, formstabile, systemverträgliche KS-Artikel aus PP, Volumen ≤ 5l, wie z.B. Flaschen, Schalen und Becher, inkl. Nebenbestandteilen wie Verschlüssen, Etiketten etc.	Ausschluss von Kartuschen für Dichtmassen	PF
PE-Fraktion	329	Gebrauchte, restentleerte, formstabile, systemverträgliche KS-Artikel aus PE, Volumen ≤ 5l, wie z.B. Flaschen und Schalen, inkl. Nebenbestandteilen wie Verschlüssen, Etiketten etc.	Ausschluss von Kartuschen für Dichtmassen	HC An

<https://www.verpackungsregister.org>

Recycling of the used cartridges is not possible

Our solution



Product overview

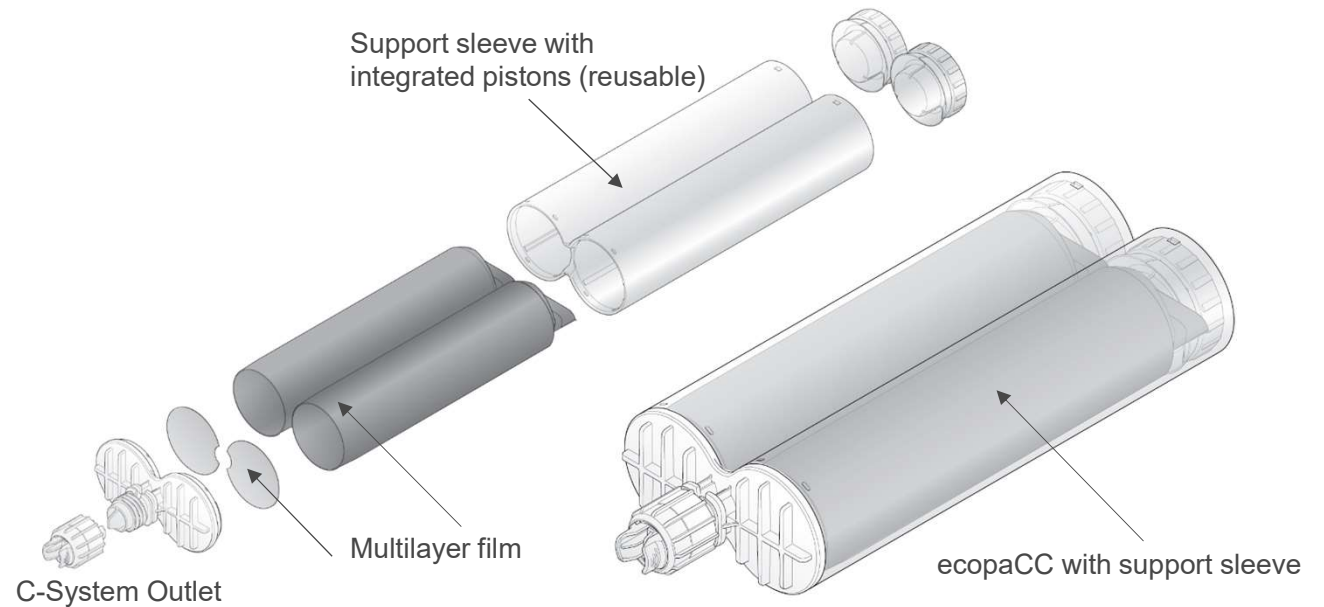
Key features

Reduce of plastic

- Use of flexible foil sleeves
- Reusable support sleeve

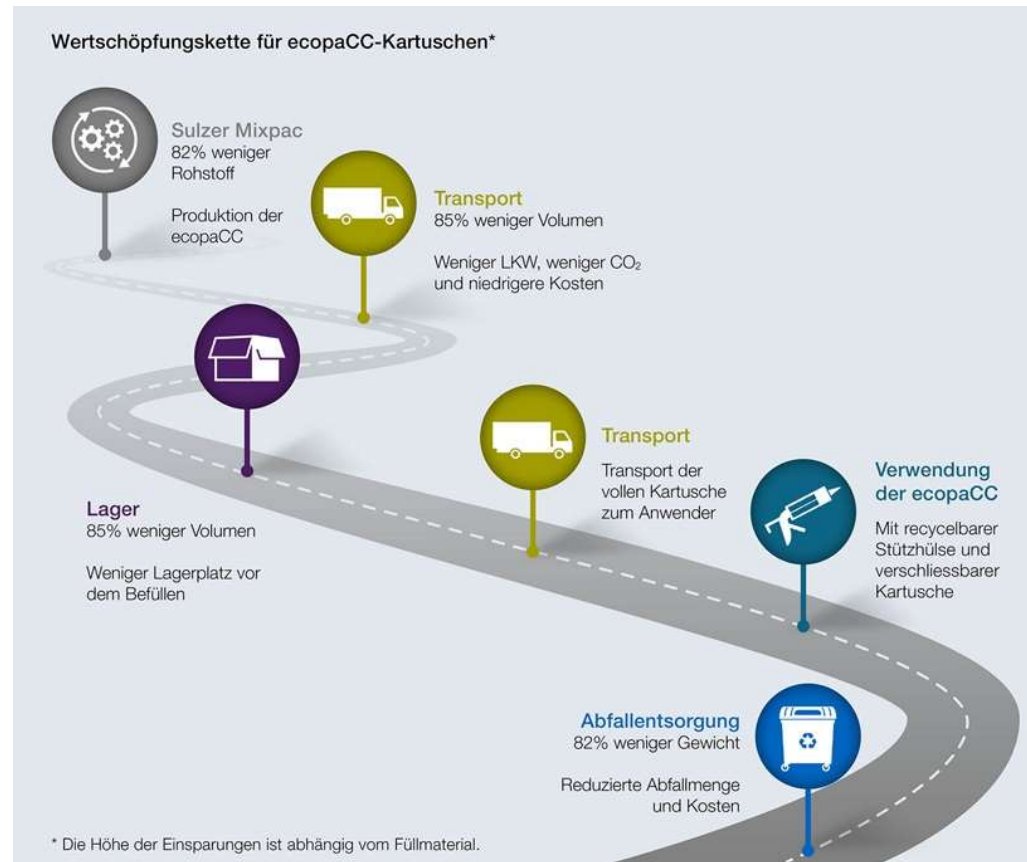
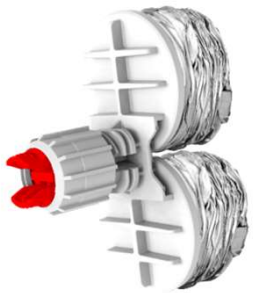
Advantages

- 100% leak proof due to over-molding technology
- Barrier properties



Product overview

Value chain savings



Product overview

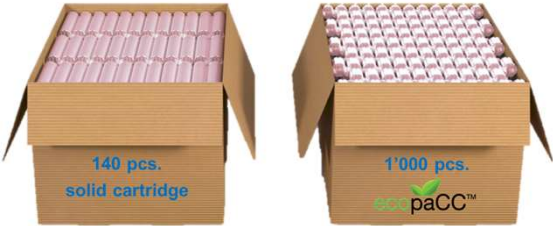
Value chain savings

Collapsible structure

The new packaging can be collapsed up to 85% compared to a rigid cartridge.



Less space needed with ecopaCC versus solid cartridge



(600mL, 1:1)



Reusable support sleeve and piston

The rigid support sleeve with integrated pistons can be reused. What's left for disposal after complete usage is the collapsed ecopaCC™ packaging.



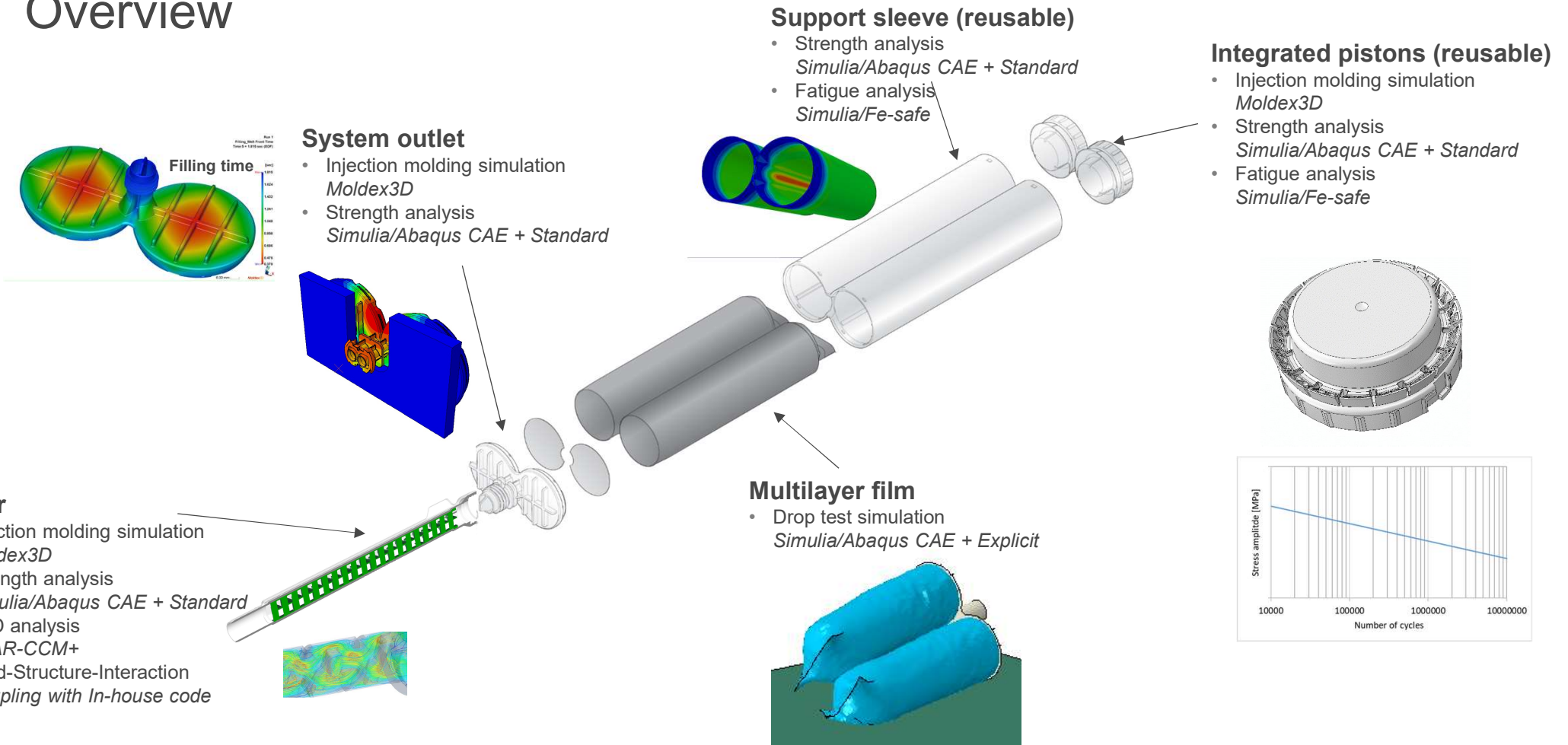
Safe of

- plastic
- emissions of CO2



ecopaCC™ - Simulation Landscape

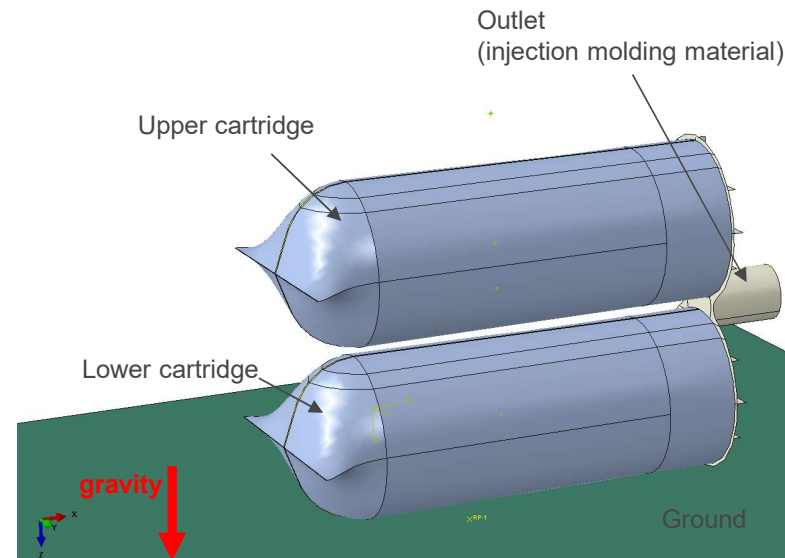
Overview



Multilayer Film – Drop Test Simulation

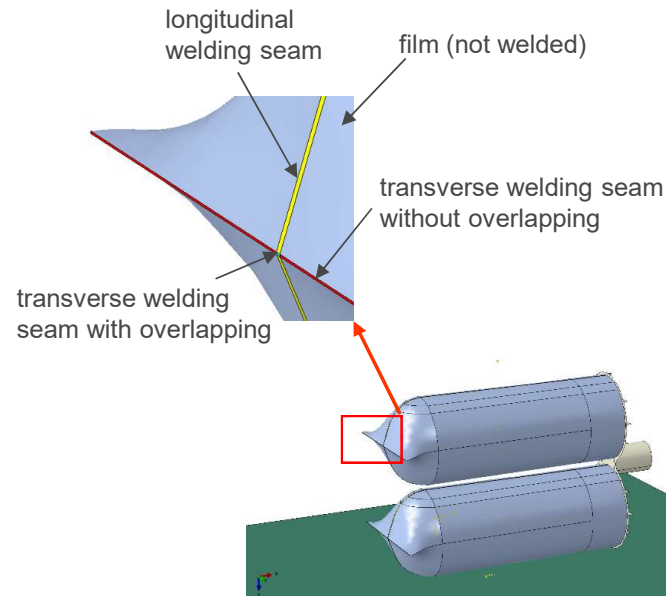
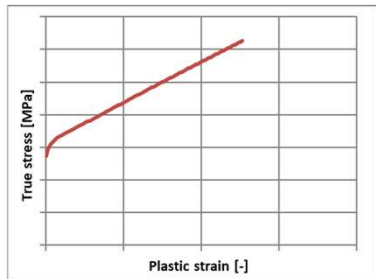
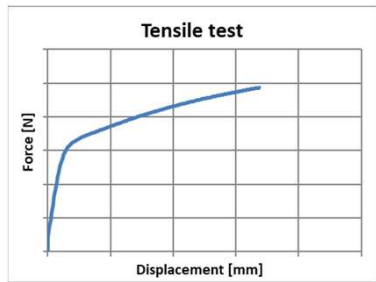
Overview

- Objective:
strain at welding lines, evaluation of film material
- Software:
Simulia/Abaqus CAE + Explicit (2019)
- Loads:
gravity
- BC:
initial velocity of 1.2 m falling height
- General Contact with friction
- Material model:
elastic-plastic
fluid cavities filled with water / water + air
- Output:
displacement, strain



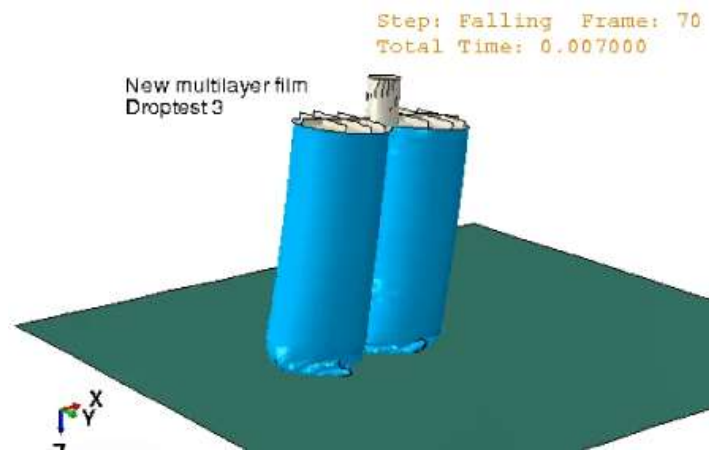
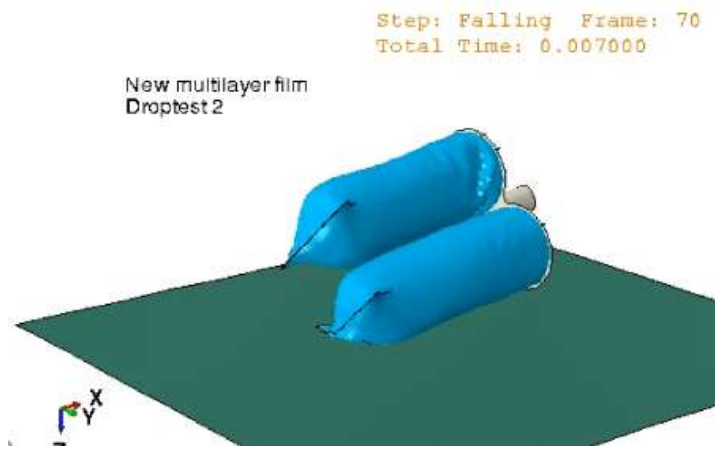
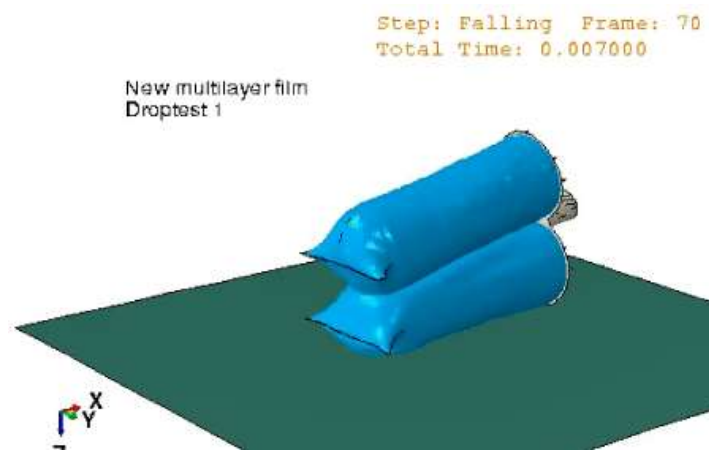
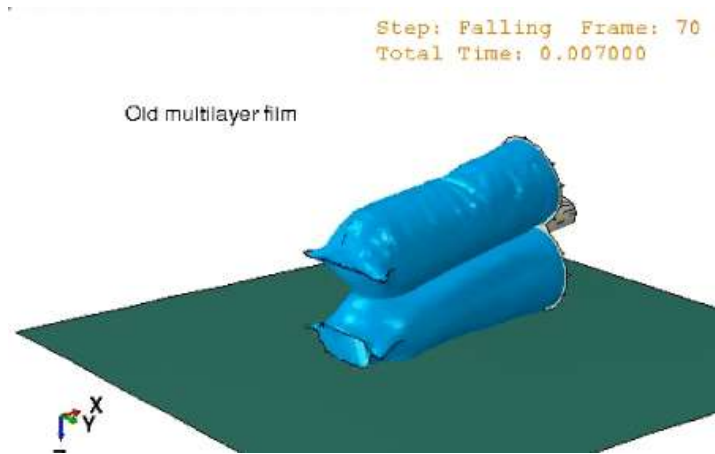
Multilayer Film – Drop Test Simulation

Material modeling



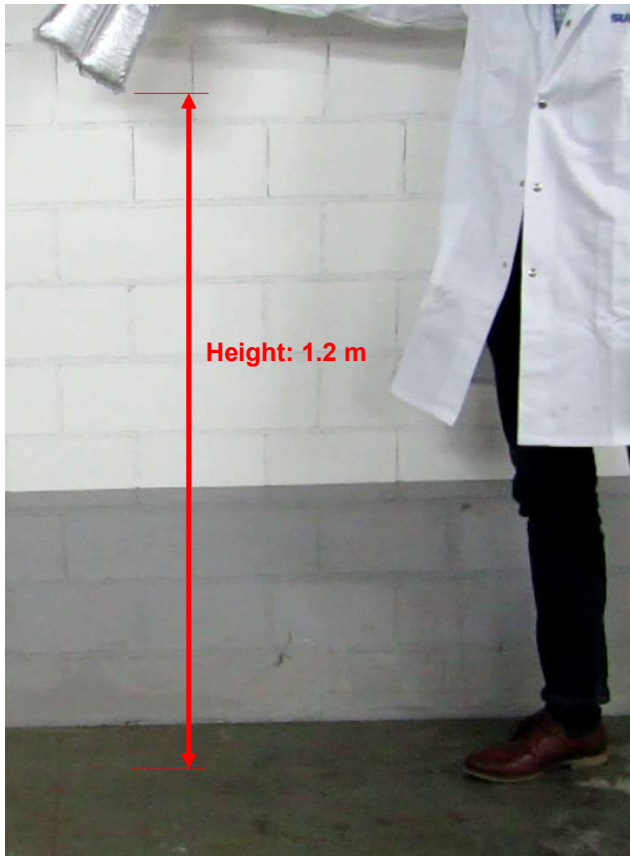
Multilayer Film – Drop Test Simulation

FEA



Multilayer Film – Drop Test Simulation

Experiment



Snapshot of impact (old multilayer film)



After drop test



Thank you!

Q&A



Contact us

Sulzer Mixpac AG

Rütistrasse 7

9469 Haag, Switzerland

Phone +41 81 772 20 00

Fax +41 81 772 20 01

mixpac@sulzer.com

www.sulzer.com



www.sulzer.com

The safe harbor statement under the US private securities litigation reform act 1995

This presentation may contain forward-looking statements, including but not limited to, projections of financial developments, market activities or future performance of products and solutions, containing risks and uncertainties. These forward-looking statements are subject to change based on known or unknown risks and various other factors, which could cause the actual results or performance to differ materially from the statements made herein.

© Sulzer Ltd 2020. All rights reserved.