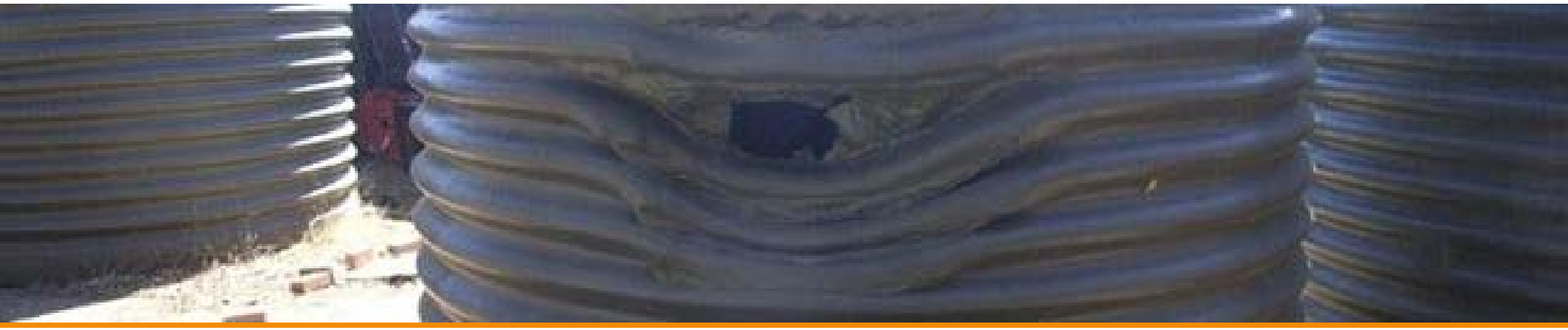
ULTRAPOLYMERS
a Spirit of Partnership

Avoid the quality traps of Rotomoulding

The 10 top reasons for failure



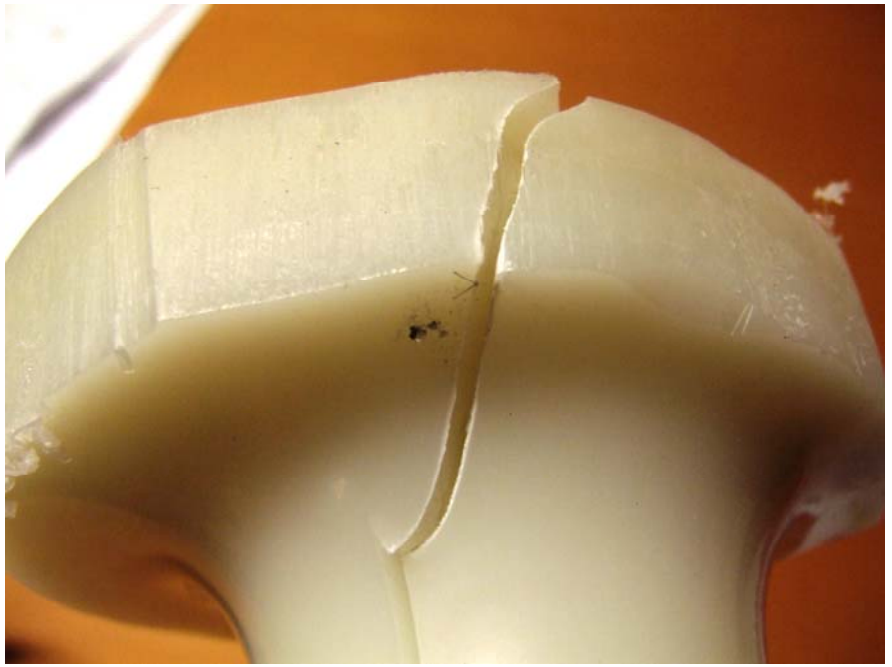
AGENDA

Introduction

Ultrapolymers / Ravago

10 reasons for failure

Recommendations



PERSONAL INFORMATION

Graduated chemical engineer 1995

Started as Development Engineer with Borealis in1996

Technical Service, Product Owner, Development and Claim Investigator

Worked with the microscopy laboratory

Joined Norner Innovation in 2007

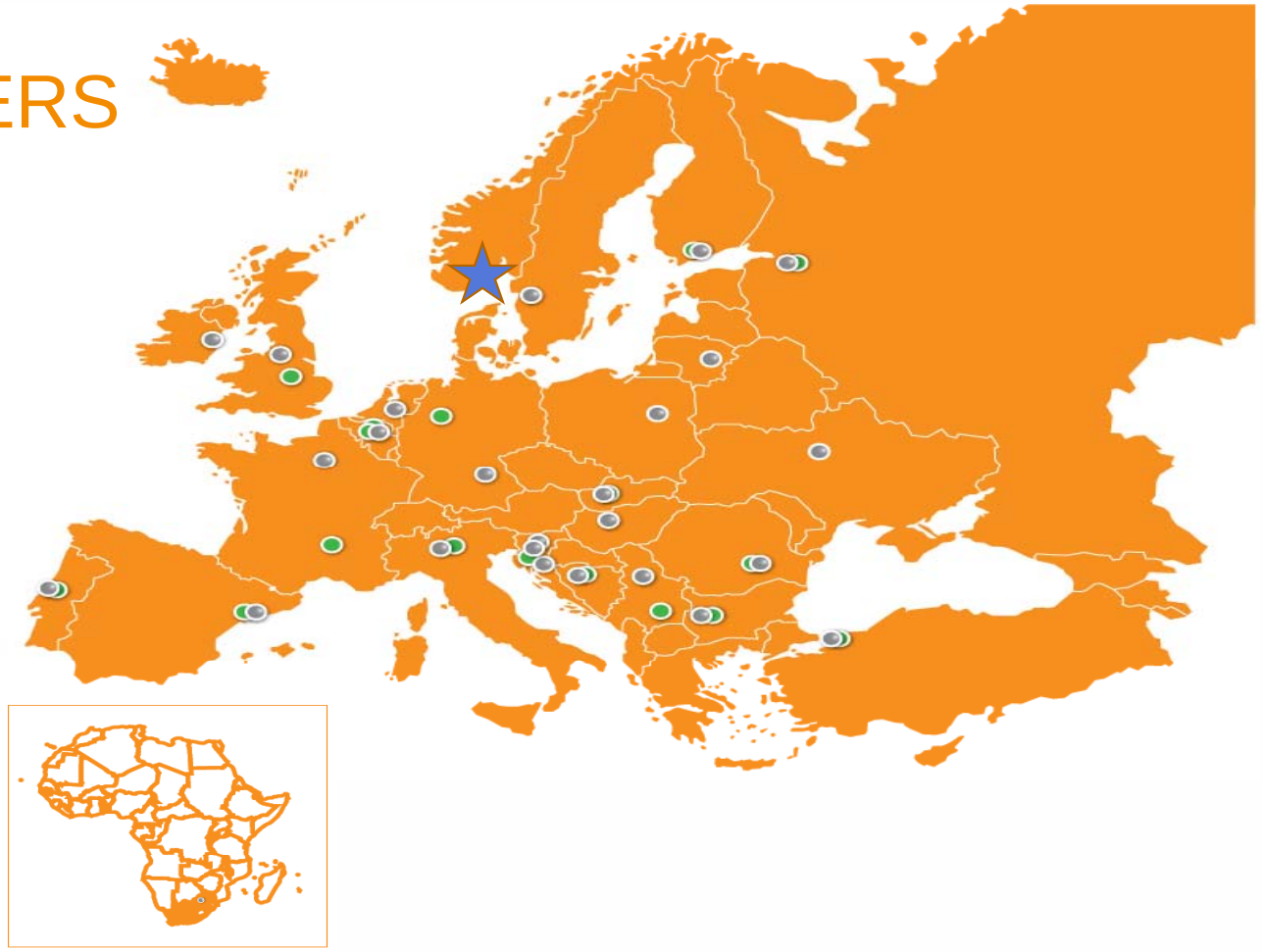
Founded Nordic ARM in 2007

Started up Rotomoulding department at OPD in 2010

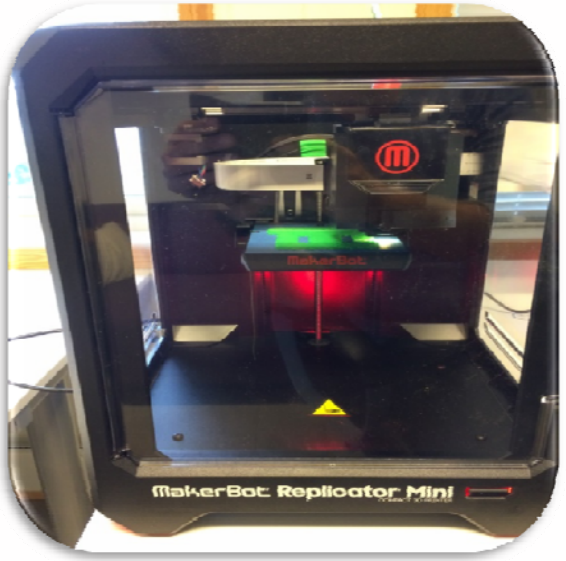
Joined Ultrapolymers in 2012

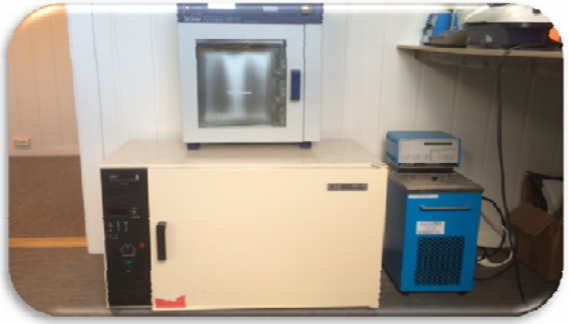
- Currently
  European Development Manager at Ultrapolymers
  General Manager at REConsult AS
  President at Nordic ARM

ULTRAPOLYMERS GROUP



MY OFFICE





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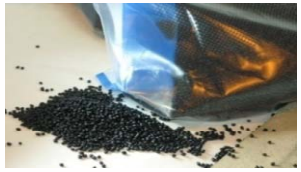
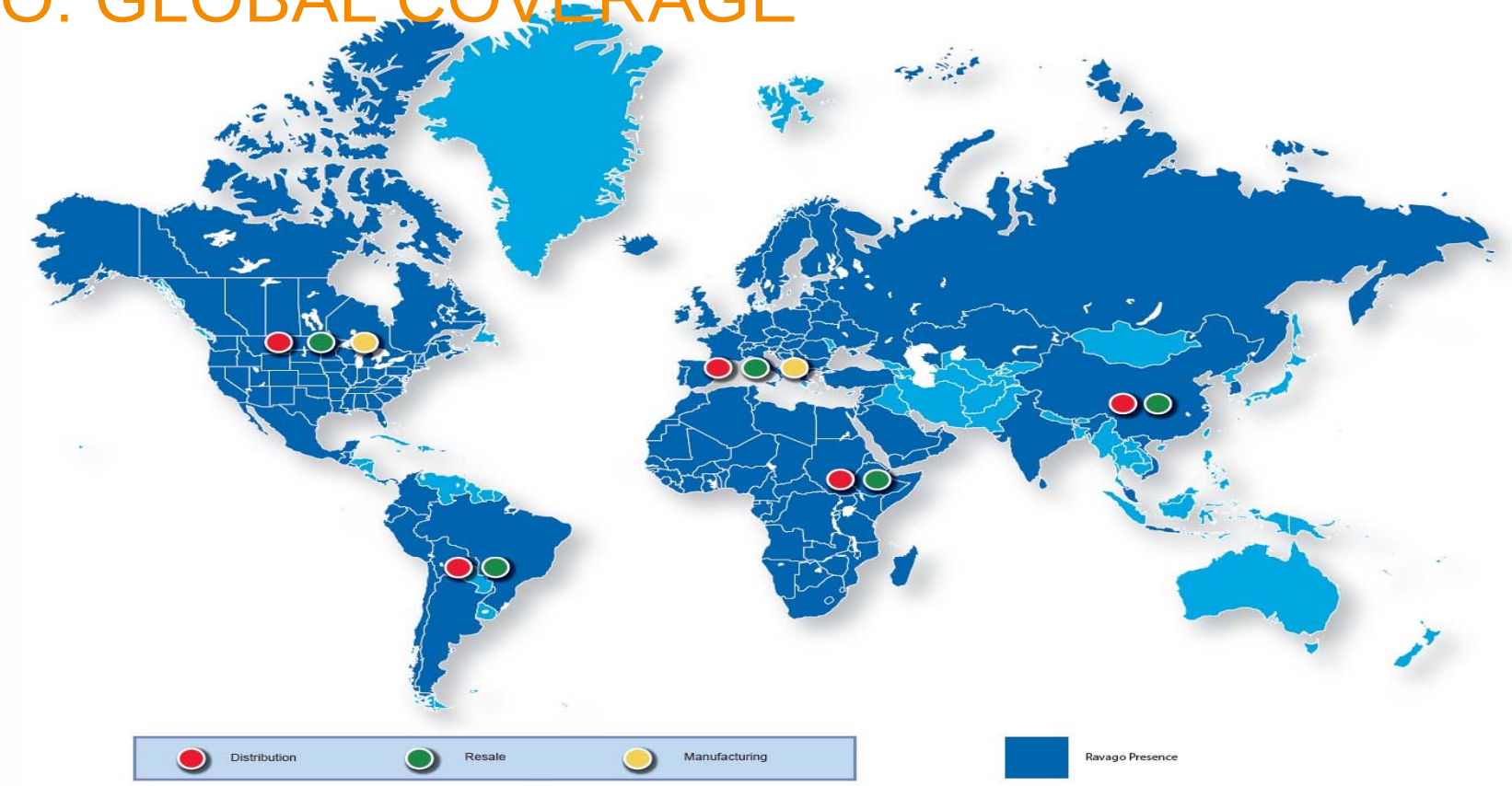
RAVAGO: GLOBAL COVERAGE





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RAVAGO USA

Channel Prime Alliance

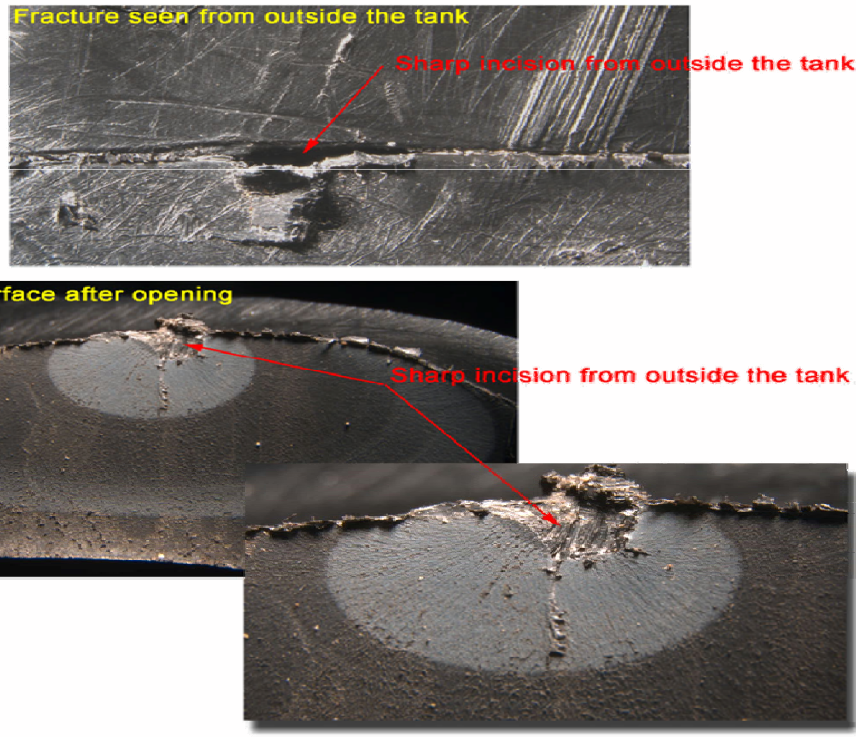
REASONS FOR FAILURE

Very often a combination of failures

Basic mistakes

Visualised with microscopy

10 most frequently analysis done on rotational moulded articles



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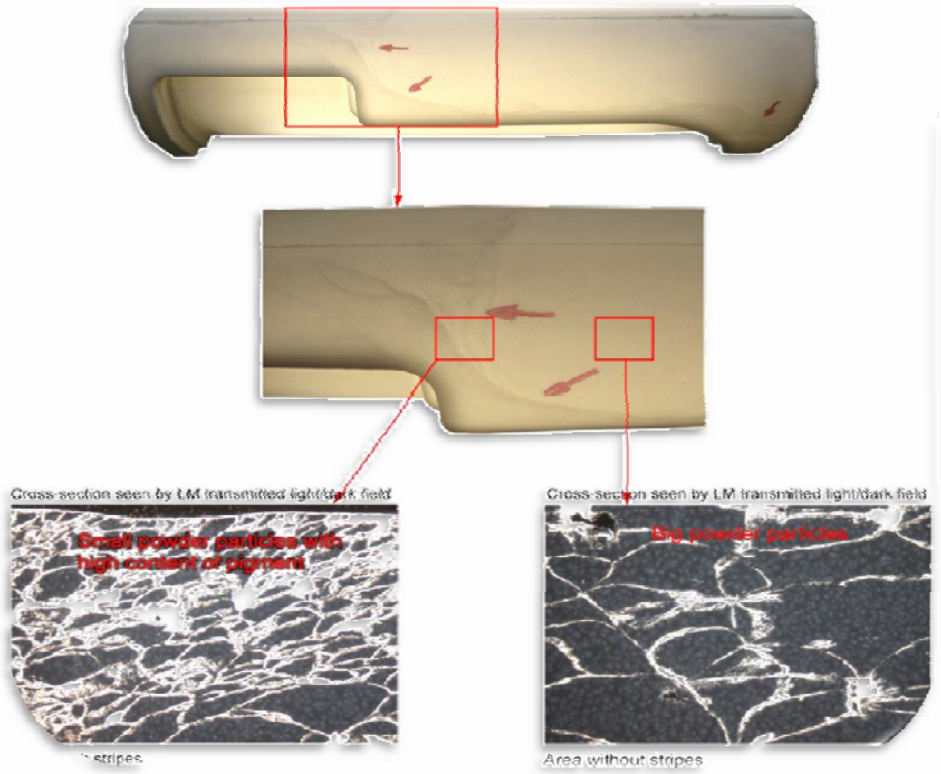
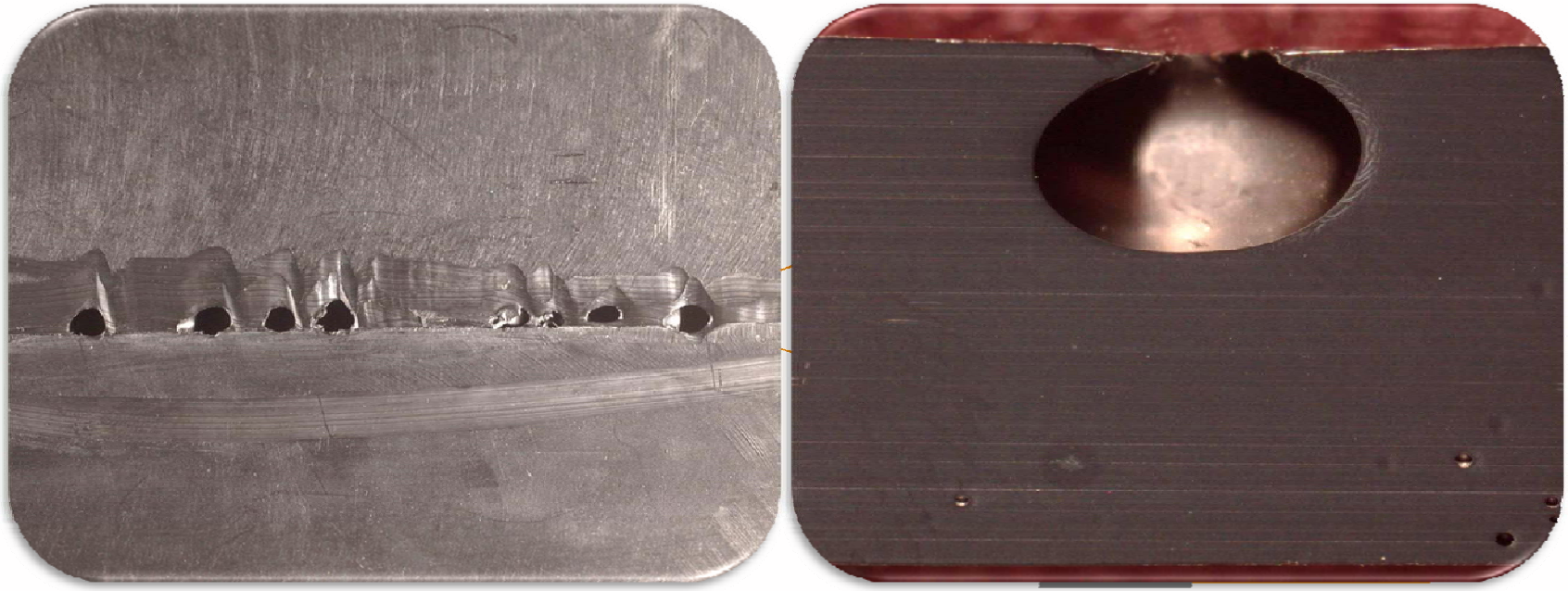
10: SWIRLING

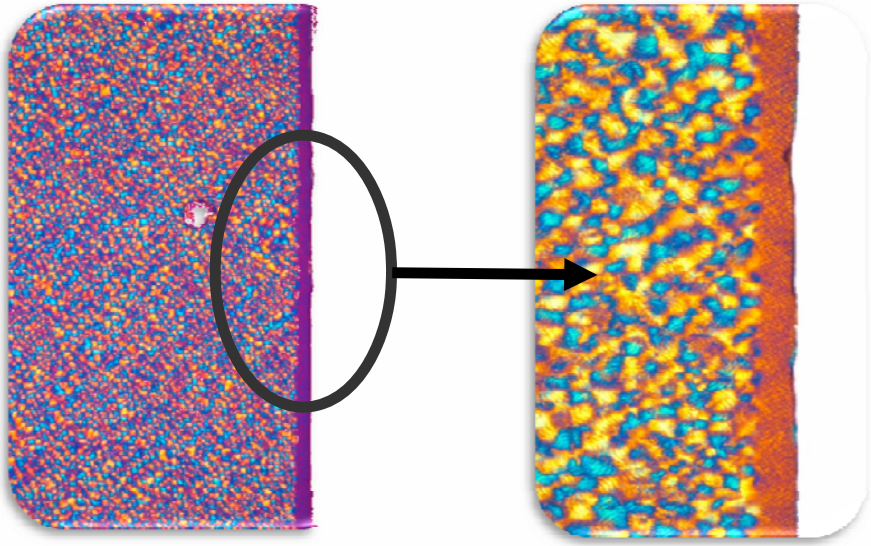
- Not caused by the pigment nor the material
- Static build up
- Fines attracted to the mould surface
- Rich in colour
- Earthen the equipment does not help

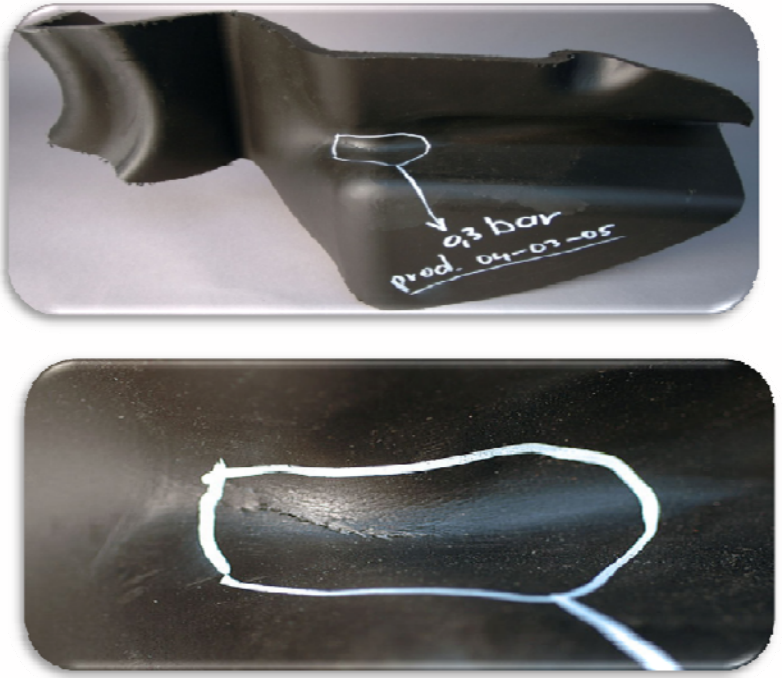


9: MOULD / VENTING PROBLEMS

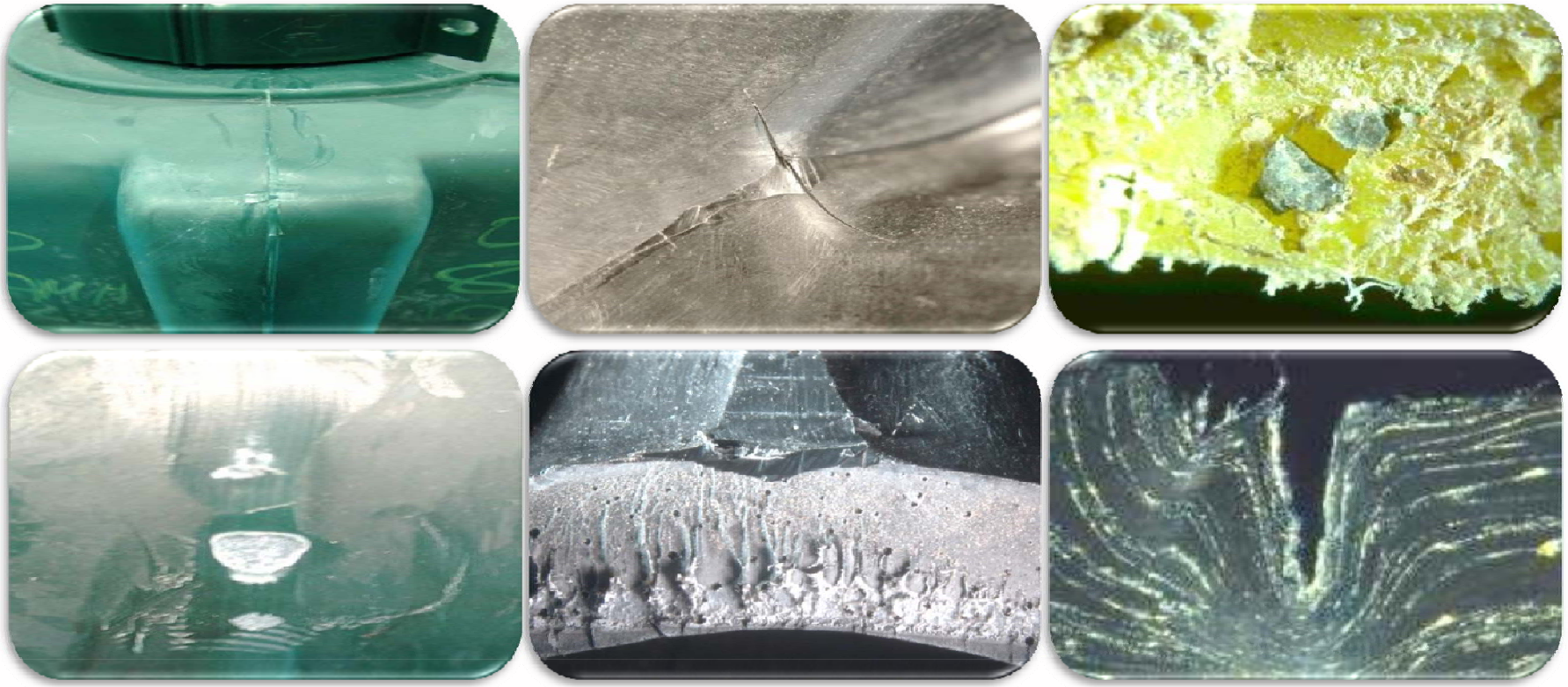


8: WRONG MATERIAL SELECTION

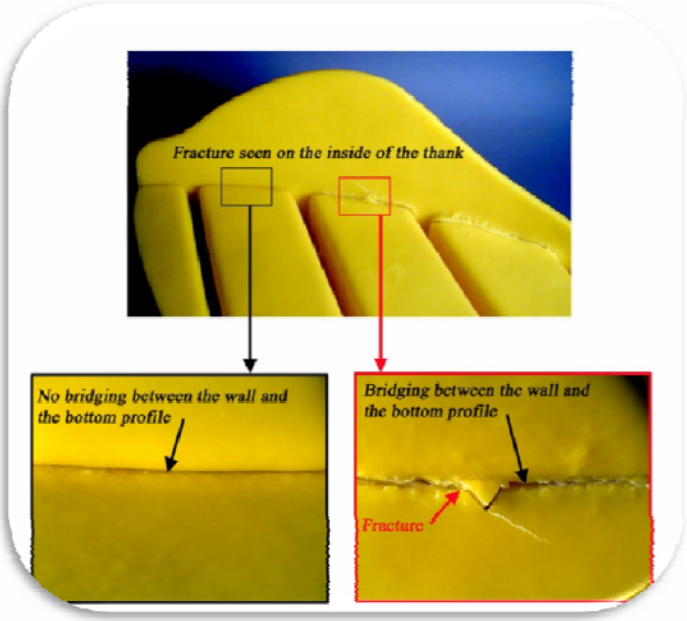


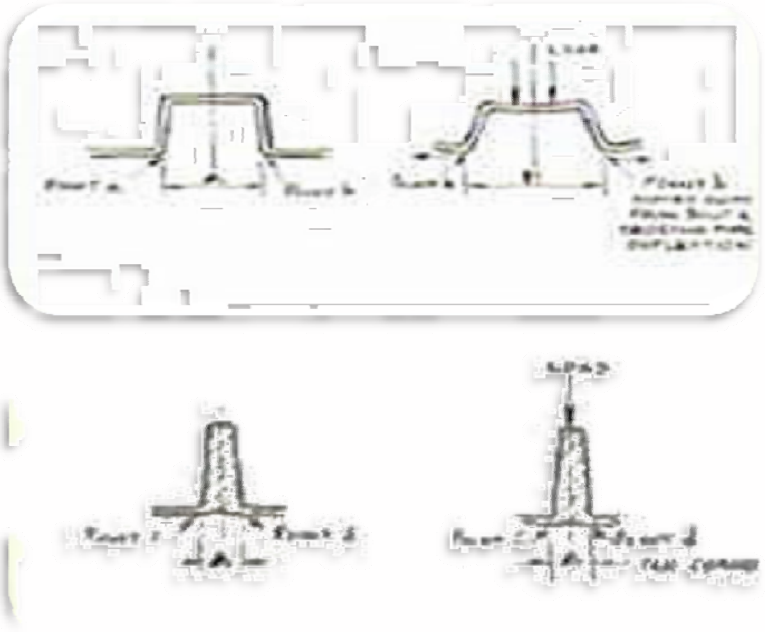


7: NOTCH SENSITIVITY

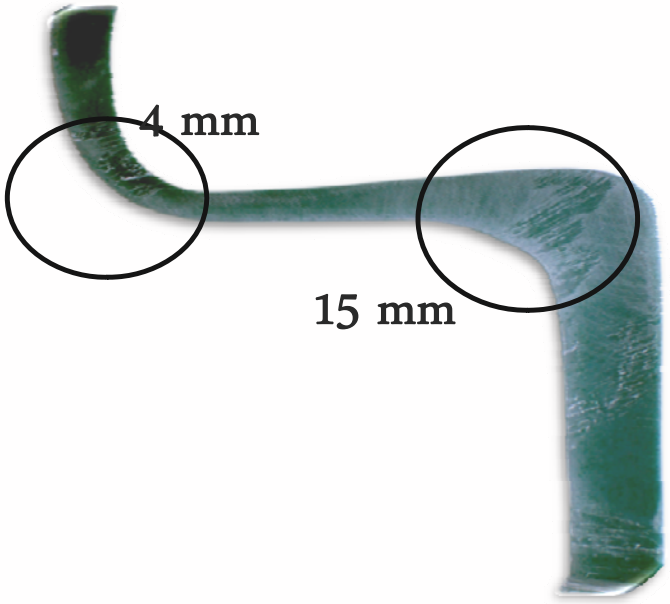


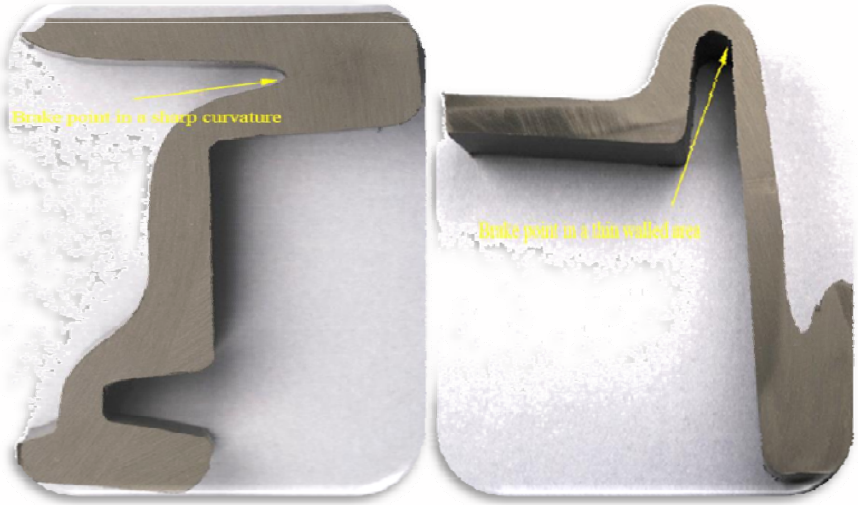
6: DESIGN


Fracture seen on the inside of the thank
No bridging between the wall and the bottom profile
Bridging between the wall and the bottom profile
Fracture

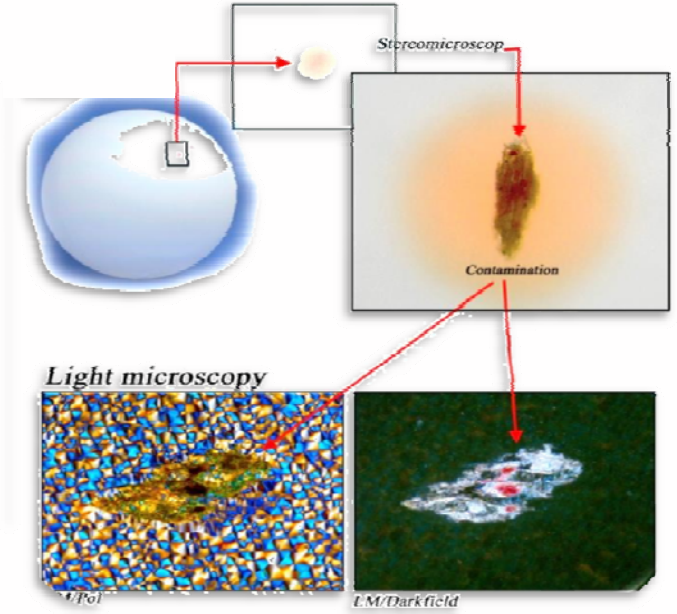


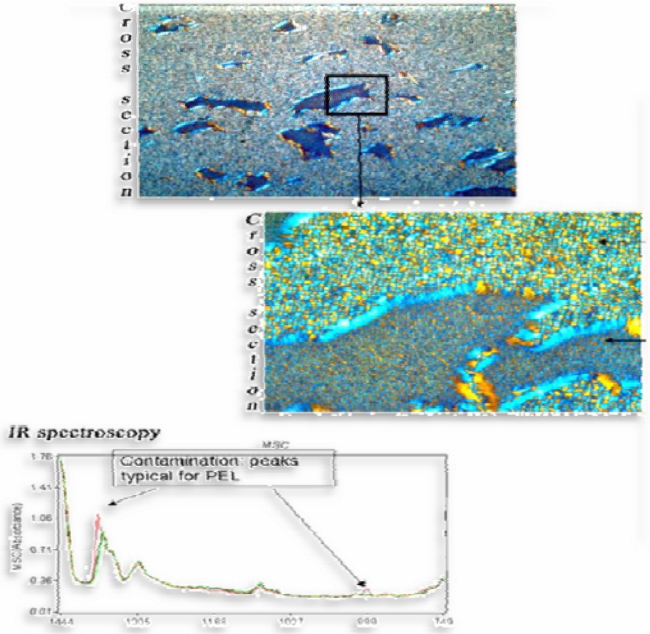
5: WALL THICKNESS DISTRIBUTION

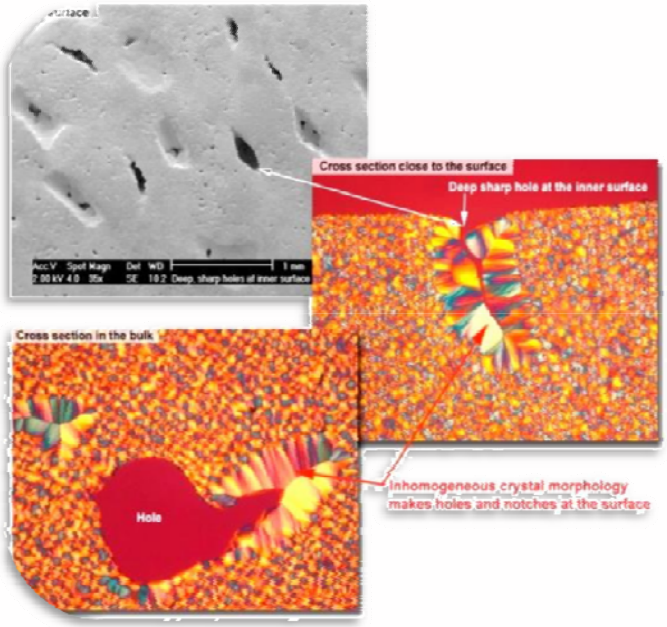




4: CONTAMINATION







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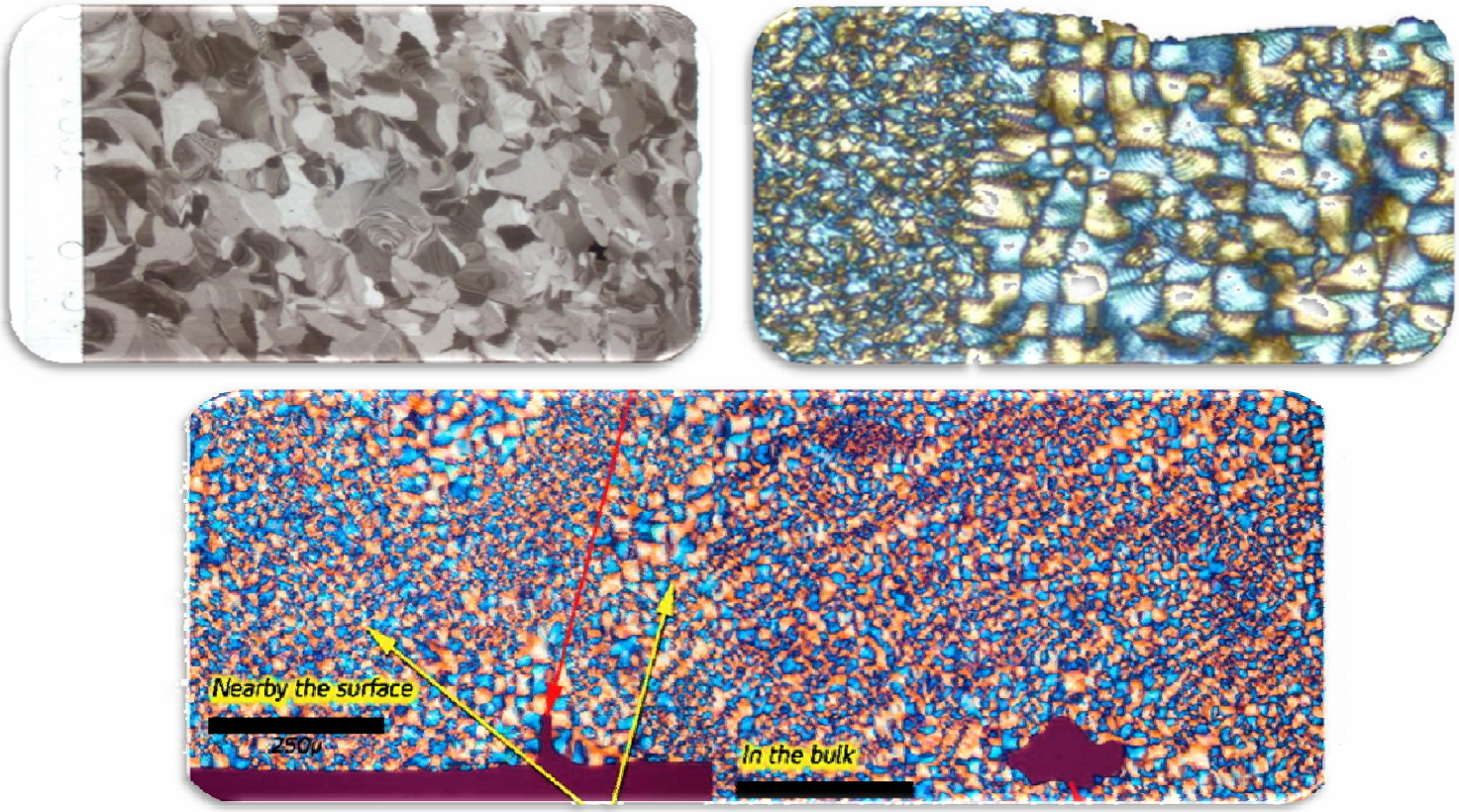
3: INHOMOGENIETY



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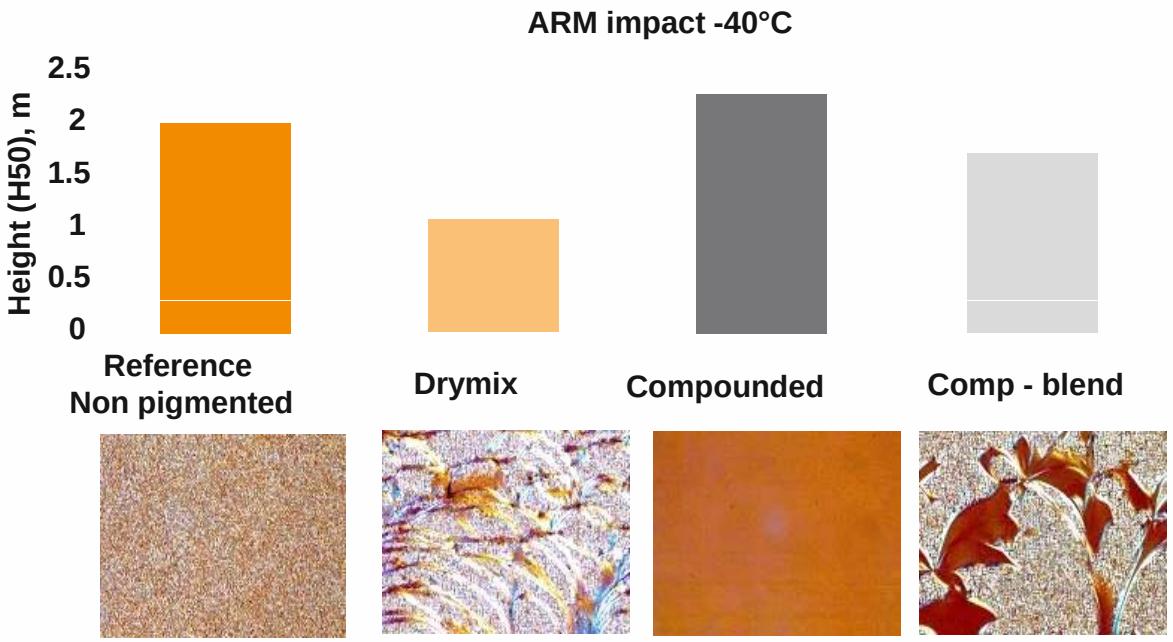
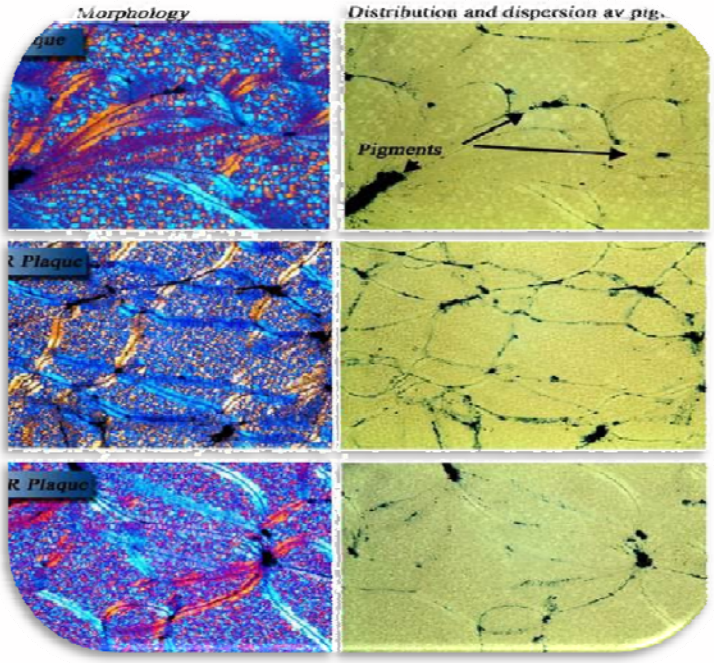
2: PIGMENTATION





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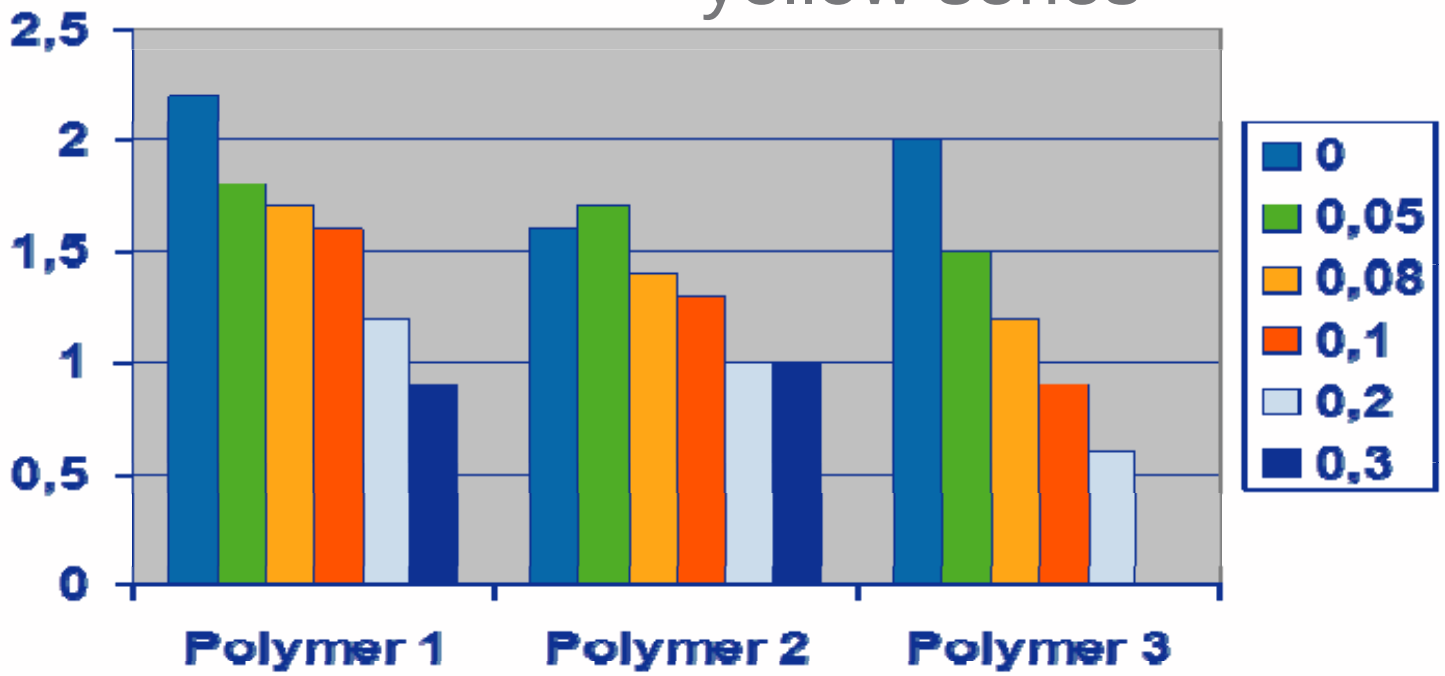
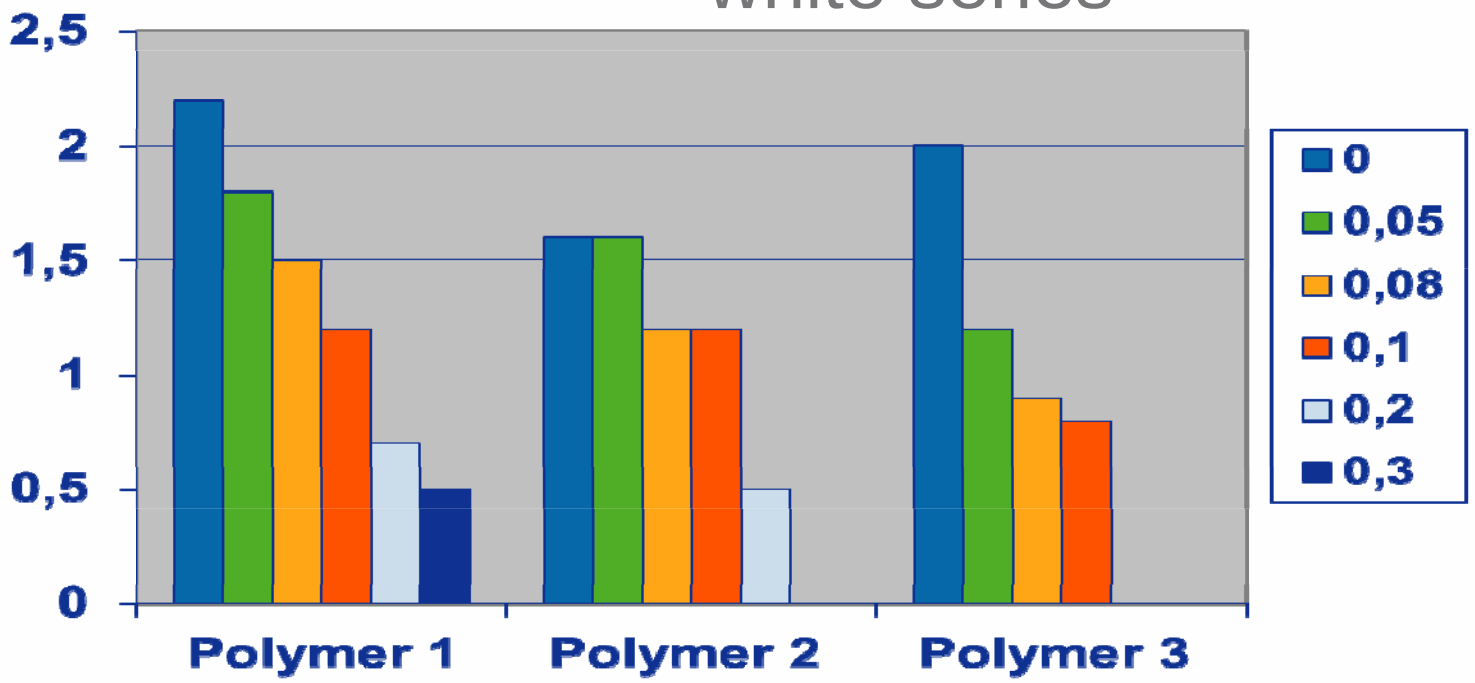
ARM IMPACT

– yellow series



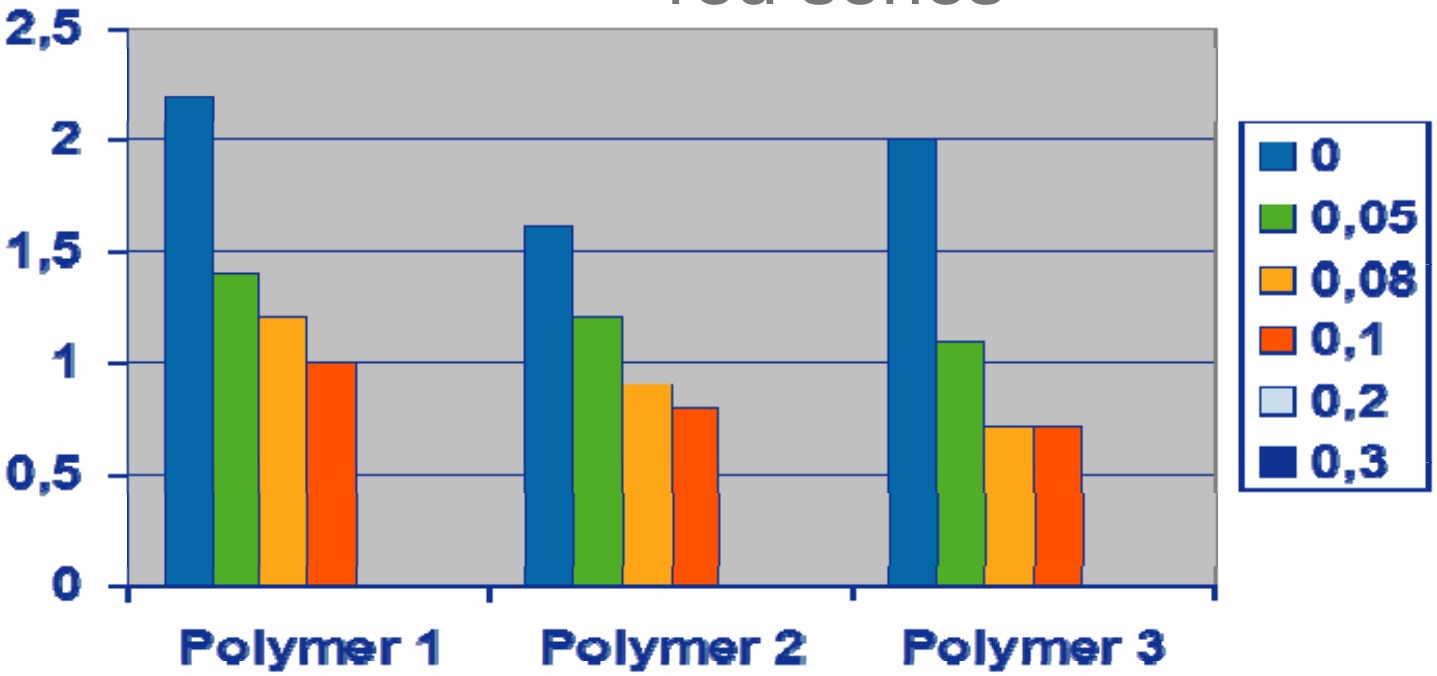
ARM IMPACT

– white series

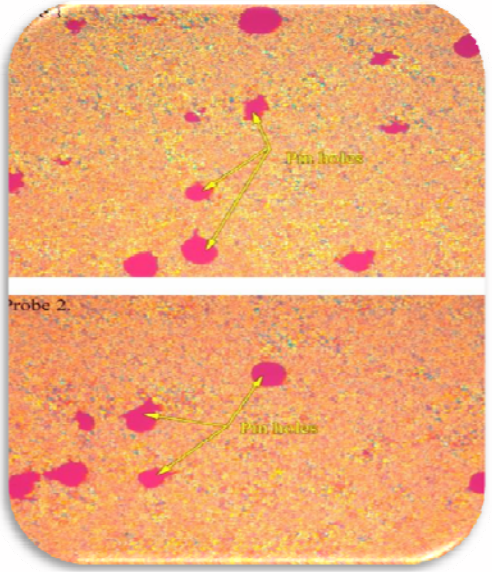


ARM IMPACT

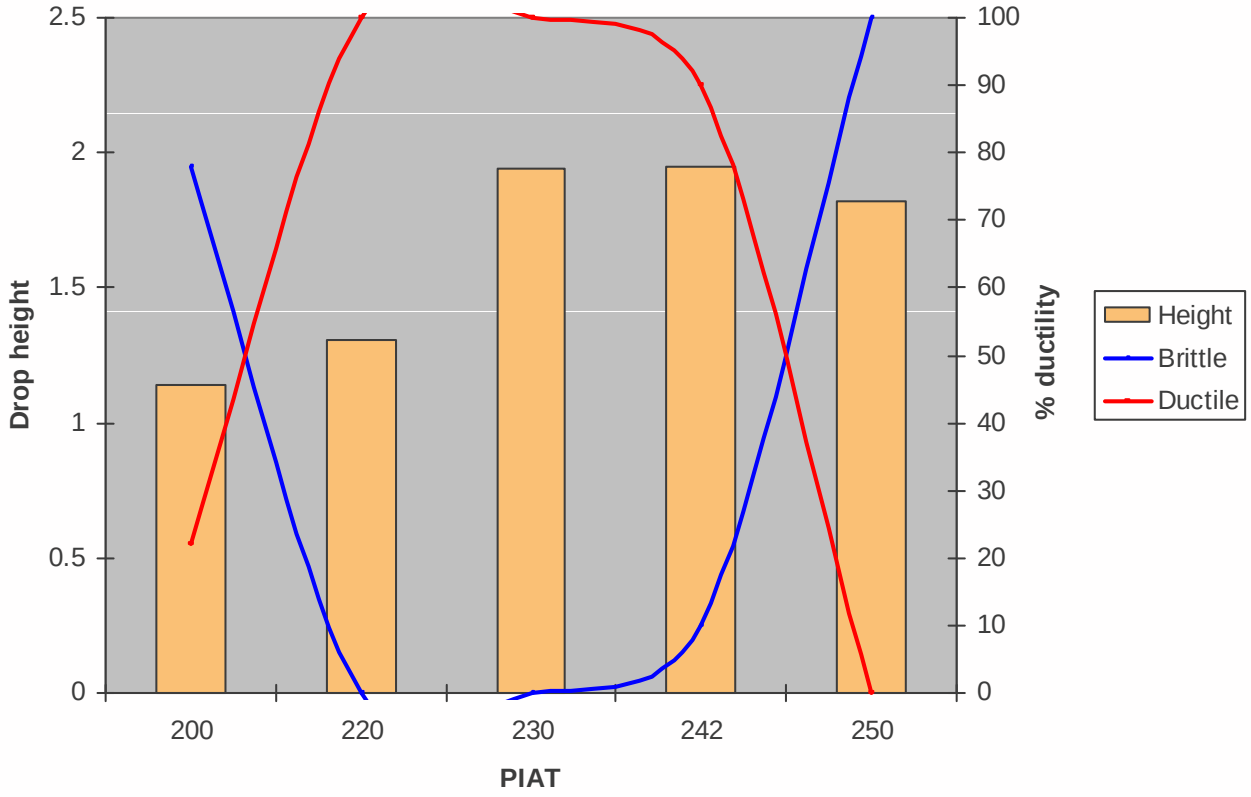
– red series



1: PROCESSING



IMPACT STRENGTH VS PIAT



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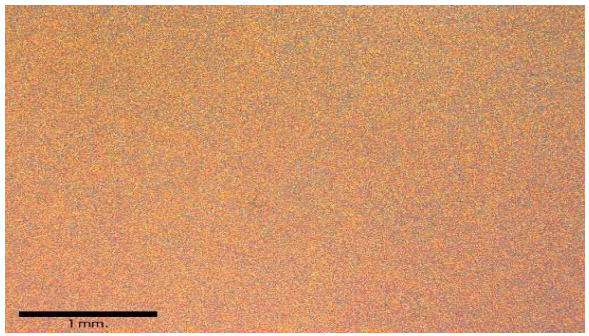
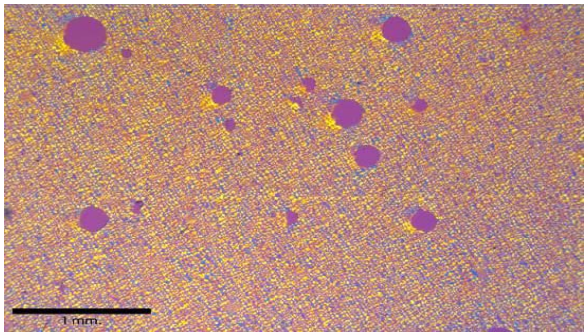
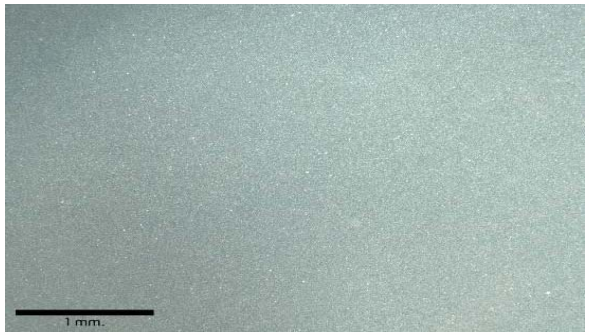
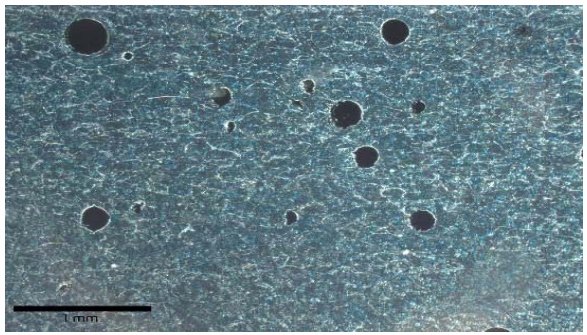
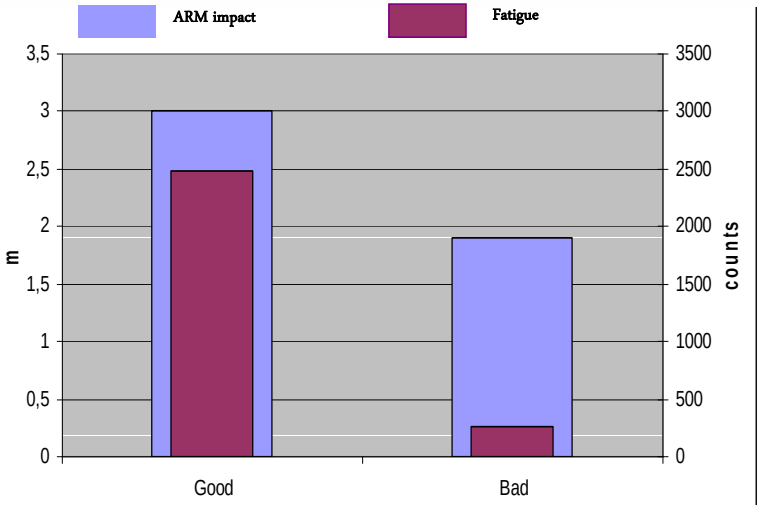
FATIGUE











ULTRAPOLYMERS

RECOMMENDATIONS

- Invest in your moulds and vents. They are defining your products
- Strive to obtain equal wall thickness, or “controlled” wall thickness
- Avoid pigments that change the material structure when dry mixing, and look for compounded alternatives
- Avoid inhomogeneity
- Ensure good processing, avoid bubbles in the wall, especially for critical articles

We need to improve on quality to be able to further compete with other conversion techniques

ULTRA POLYMERS
a Spirit of Partnership

Thank you for the attention

If you have questions, you can meet me at the Muehlstein stand

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Rotational Moulding

ronny.ervik@ultrapolymers.com