

Performance
BIB



28-30 Octobre 2008 / La Grande Motte, France



Date : Thursday 30 October 2008

Title : Qualification of a new flexitank

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Presentation Outline:

- Initial thoughts
- Lab test
- Application test
- Ship test
- Acknowledgements





Initial thoughts:

- The qualification of a new material and film / sheet manufacturer will be slightly different than the qualification of a flexitank already used in the market.
 - This presentation addresses the 'new material and film / sheet manufacturer' version because it is more encompassing.
- If applicable, always test a control flexitank versus a new flexitank.
- As with most purchased components, audits and documentation are critical:
 - Audits:
 - Manufacturer location
 - Fitting depot
 - Documentation:
 - Signed specification for component types / materials, dimensions, etc. with a 'no change' clause.
 - COAs
- After qualification, scale-up responsibly.





Lab test:

- EU and FDA approval for direct food contact
- Organoleptic
- Film / sheet:
 - Material properties:
 - Density: ASTM D1505
 - Melt index: D1238
 - Layer ratios (pictures)
 - Carbon black content: D1603
 - Carbon black dispersion: D5596
 - Physical properties:
 - Thickness: ASTM D5199
 - CD and MD tensile strength and elongation: D638 / D6693
 - CD and MD tear strength: D1004
 - Puncture resistance: D4833

Thickness (mils)	
39.2	
39.2	

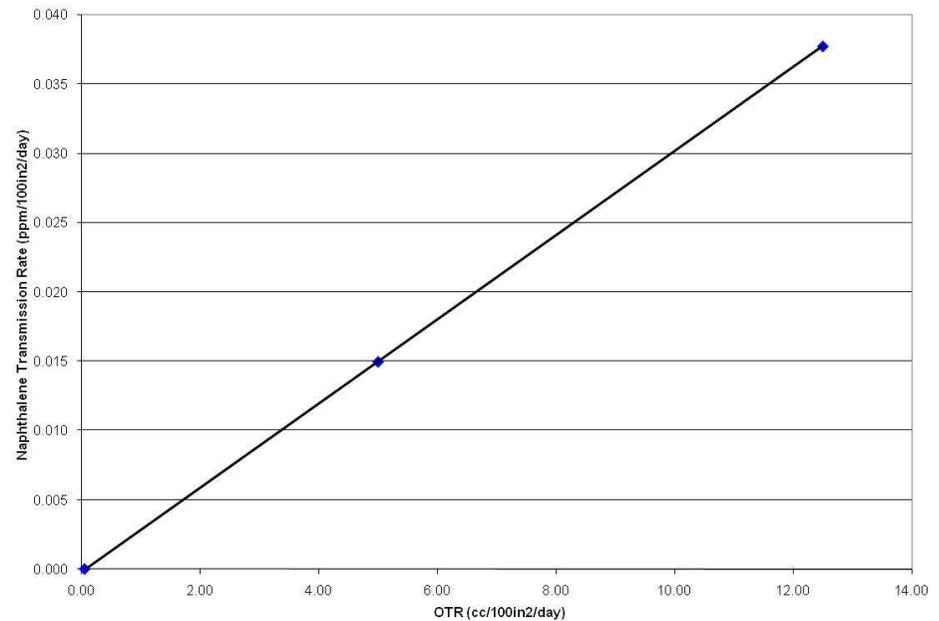
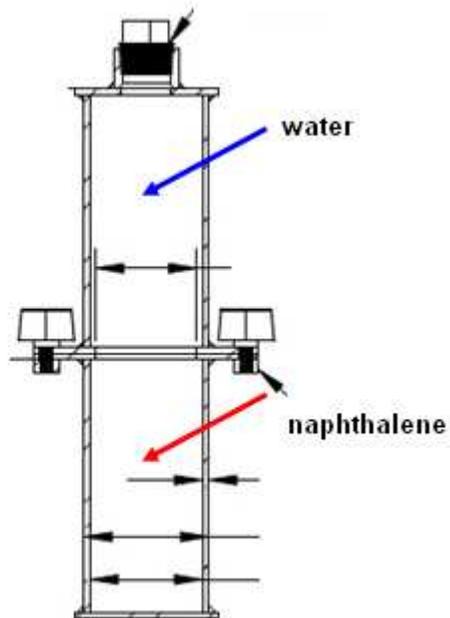
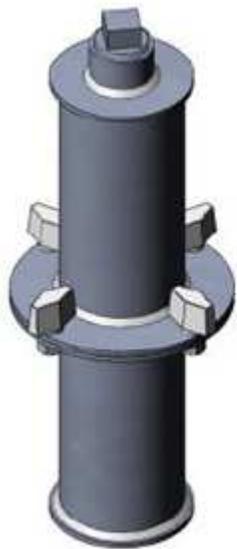
Thickness (mils)	
12.28	
13.81	
12.90	
39.00	





Lab test:

- Film / sheet:
 - Barrier:
 - Chemical (pictures) and paint
 - Oxygen transmission rate (OTR)
 - Water vapor transmission rate (WVTR)





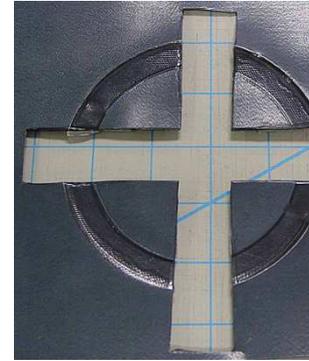
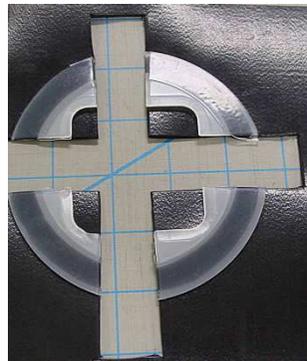
Lab test:

- Flexitank:

- Air pressure (100%)

- Seal strength: **shear** and **peel**

- Circle: valves



- Extrusion: ends of flexitank



- Wedge: bottom of flexitank along the length





Application test:

- Extreme deceleration:
 - Horizontal:
 - Rail or truck stoppage.
 - Often severe enough to damage bulk head and container (top pictures).
 - Vertical:
 - Container drop.
 - Simulate (bottom pictures) or test.





Application test:

- Water pressure:

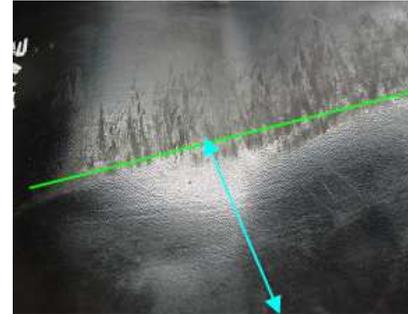
- Fill with water until flexitank burst.
- Record target volume, failure volume, and failure mode.





Ship test:

- Two main ship test:
 - > 2x longest rail route portion only
 - Actual route (ex: truck to rail to sea to truck)
- Organoleptic and chemistry
- Visual inspection:
 - Abrasion, puncture, and snag (top pictures)
 - Next to container
 - Flex crack (bottom picture)
 - Headspace





Ship test:

- Visual inspection - continue:
 - Insure that the aluminum foil or EVOH sleeve did not rip (bottom picture), or does not contain entrapped air (right picture).





Ship test:

- Performance:

- Flow rate / time to fill and empty
- Residual liquid



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Acknowledgements:

- Mark Page - Market Manager (Scholle, Europe)

