

www.michem.com



Primerless Heat Seal Coatings for Film Substrates

Ginger Cushing
Business Development Manager

Agenda

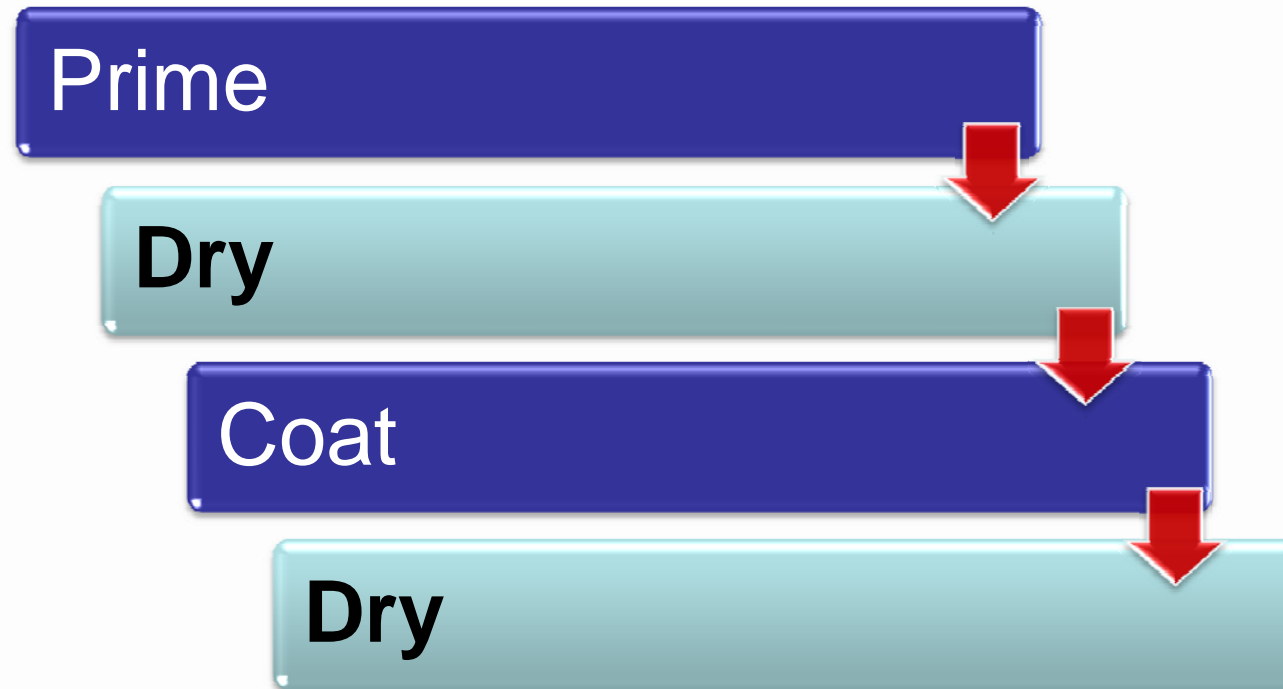
- Aqueous heat seal coatings for film
 - Desirable properties
 - Conventional technology
- Primerless coatings
- Other properties
- Summary

Heat Seal Coating for Film: Desirable Properties

- Wide heat seal temperature range
- High hot tack throughout the range
- Good bond strength and adhesion
- Ease of processing
- Appearance
- Food contact compliance

Conventional Technology

- Traditionally double-coating systems



Conventional Technology

- Polyethylene Acrylic Acid (EAA)
- Acrylics
- Polyvinylidene Chloride (PVdC)

EAA

- Good for face-to-face (A/A) seals
- Transparent
- High hot tack
- Low seal initiation temperature (SIT)
- Broad seal window
- Low melt viscosity
 - Facilitates chain mixing during heat seal
- May be heat sensitive at elevated temperatures

Acrylics

- Good for both A/A and A/B heat seals
- Transparent
- Compared to EAA
 - Higher SIT
 - Narrower heat seal range
 - Lower hot tack

PVdC

- Contributes oxygen and moisture barrier
- Compared to EAA and Acrylics
 - A/A seals
 - Higher SIT
 - Lower hot tack
 - Heavier coat weights required (2 – 3x)
 - May discolor over time

Conventional Heat Seal Coatings

- Polyethylene Acrylic Acid (EAA)
- Acrylics
- Polyvinylidene Chloride (PVdC)

these coatings require a primer to adhere to the base film

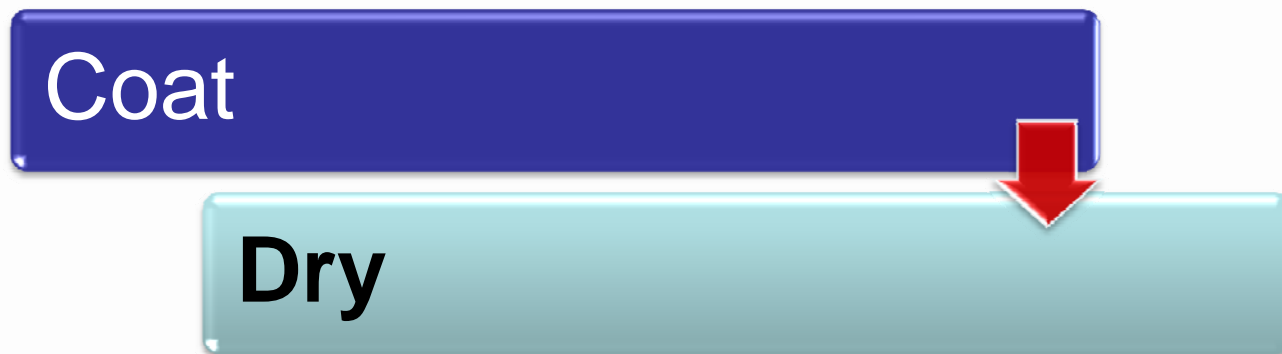


Primerless Heat Seal Coating



INNOVATION

- Single component
- Lower seal initiation temperature
- Broader heat seal window
- No primer required





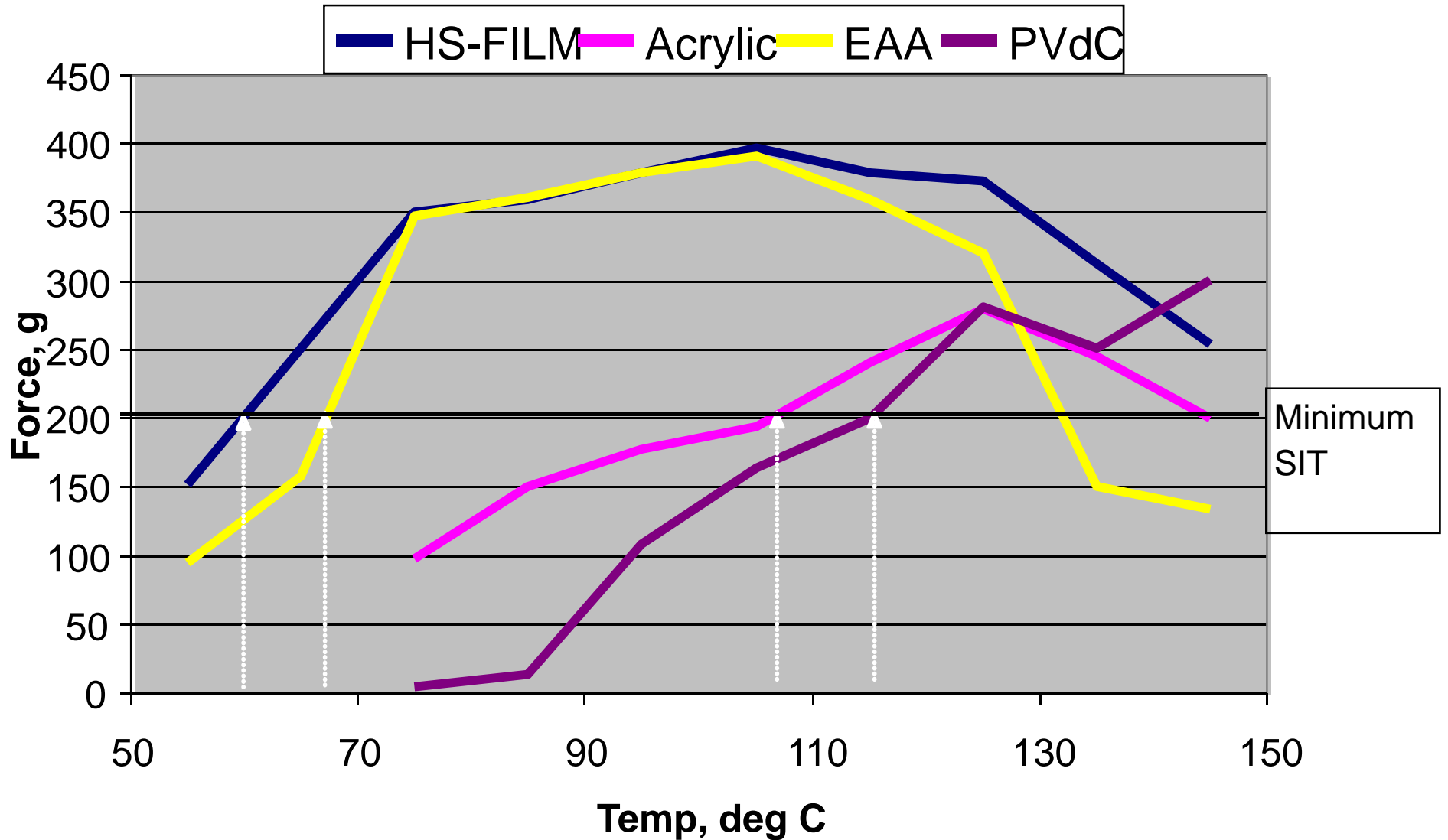
Hot Tack Comparison of Aqueous Coatings



Hot Tack Measurement

- Tested to ASTM F1921-98
- Tests immediate bond strength as the bond exits the heat sealer (measured in g force)
- Important in determining packaging speed, sealing conditions, and variety of packaging equipment that can be used

Comparison of Coatings on 29 μ BOPP film



Water Based Heat Seal Coatings Summary (Metric)

SAMPLE	Dry Coat Weight g/m²	Minimum Heat Seal Initiation Temp °C
BOPP/ HS-FILM	1	60
BOPP/Primer/ EAA	1	68
BOPP/Primer/ Acrylic	1.5	104
BOPP/Primer/ PVdC	3	114

Water Based Heat Seal Coatings Summary (English)

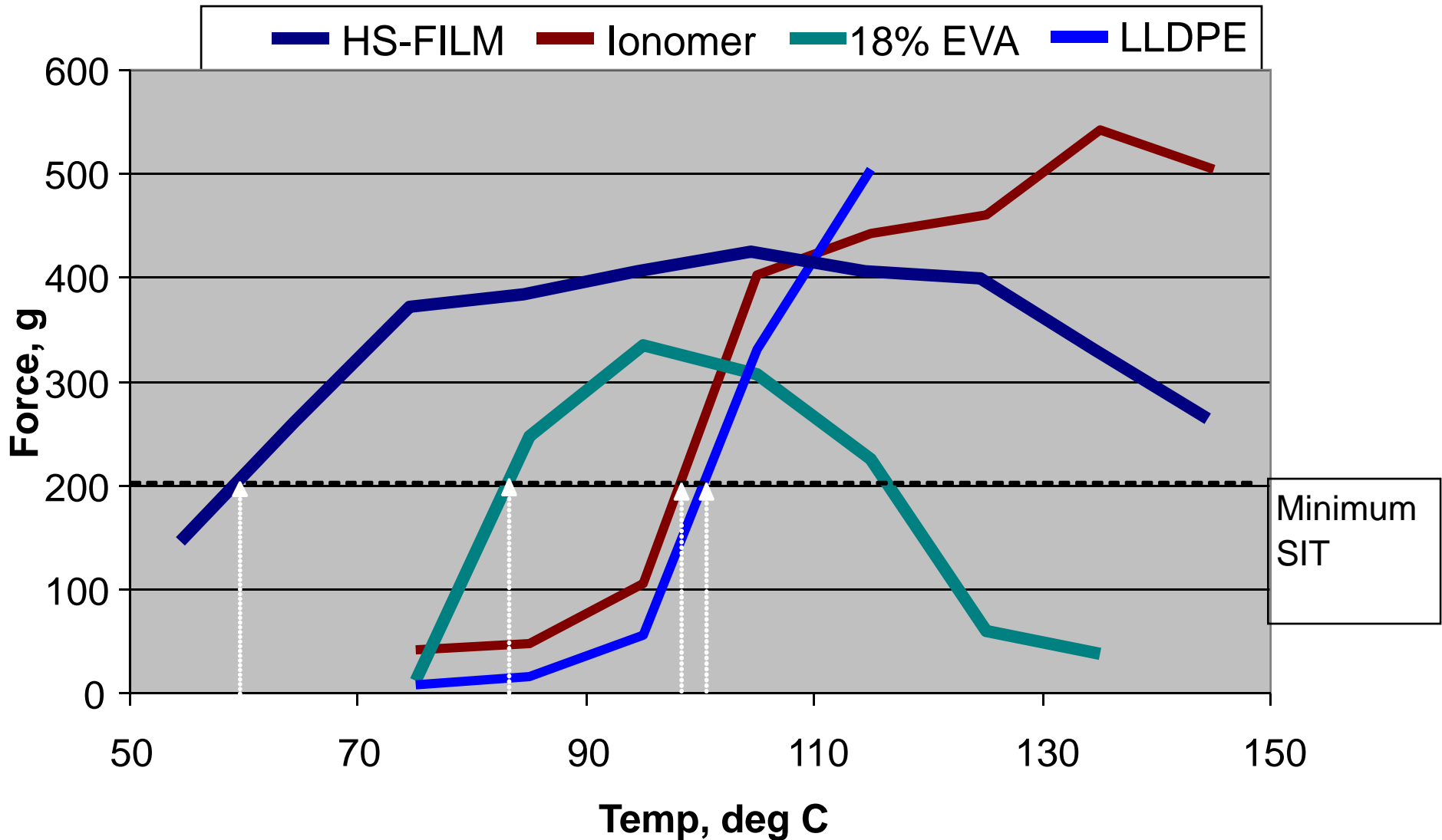
SAMPLE	Dry Coat Weight lb/3000 ft² ream	Minimum Heat Seal Initiation Temp °F
BOPP/ HS-FILM	0.6	140
BOPP/Primer/ EAA	0.6	154
BOPP/Primer/ Acrylic	0.9	219
BOPP/Primer/ PVdC	1.9	237



Hot Tack Comparison to (Co-)Extruded Resins



Comparison of Heat Seal Coatings to Extruded Resins



Extruded Heat Seal Coatings Summary (Metric)

SAMPLE	Dry Coat Weight g/m²	Minimum Heat Seal Initiation Temp °C
HS-FILM	1	60
EVA (18%VA)	12	82
Ionomer	12	97
LLDPE	12	102

Extruded Heat Seal Coatings Summary (English)

SAMPLE	Dry Coat Weight lb/3,000 ft² ream	Minimum Heat Seal Initiation Temp °F
HS-FILM	0.6	140
EVA (18%VA)	7.5	180
Ionomer	7.5	207
LLDPE	7.5	216

**Can a thin layer of solution-applied
heat seal coating be an alternative to
heavier coat weights of sealants
applied via (co)-extrusion?**

**DOWN GAUGING!
SUSTAINABILITY!**



Other Properties Exhibited by Primerless Heat Seal Coating



Adhesion

- Excellent adhesion to treated, unprimed:
 - BOPP
 - BOPET
 - BOPA
 - Cellulose
 - PLA

Orientation

- Survives the in-line stretching process

MDO  **TDO**

And more...

- Optically clear, transparent
- Food compliant

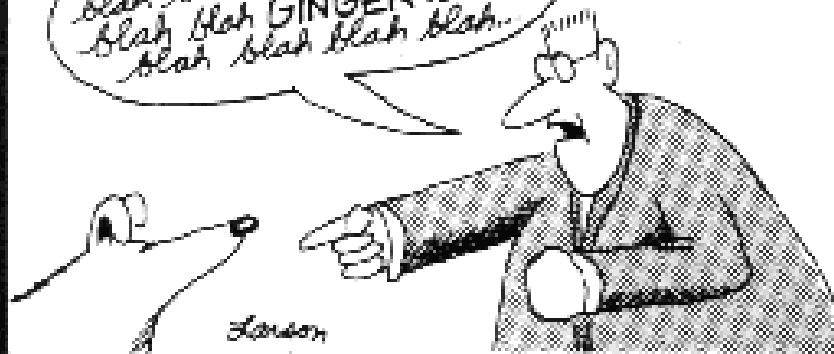
What we say to dogs

Okay, Ginger! I've had it!
You stay out of the garbage!
Understand, Ginger? Stay out
of the garbage, or else!



What they hear

blah, blah GINGER blah
blah, blah blah blah blah
blah, blah GINGER blah
blah, blah blah blah.



Summary – Primerless Heat Seal Coating Characteristics

- Strong substrate adhesion
- Excellent hot tack properties
- Low seal initiation temperature
- Broad heat seal window
- Clarity
- Stretchability
- Food compliance

www.michem.com

MICHELMAN[®]
YOUR COMPETITIVE EDGE.[™]

Thank you.

Ginger Cushing
Business Development Manager
gingercushing@michem.com

