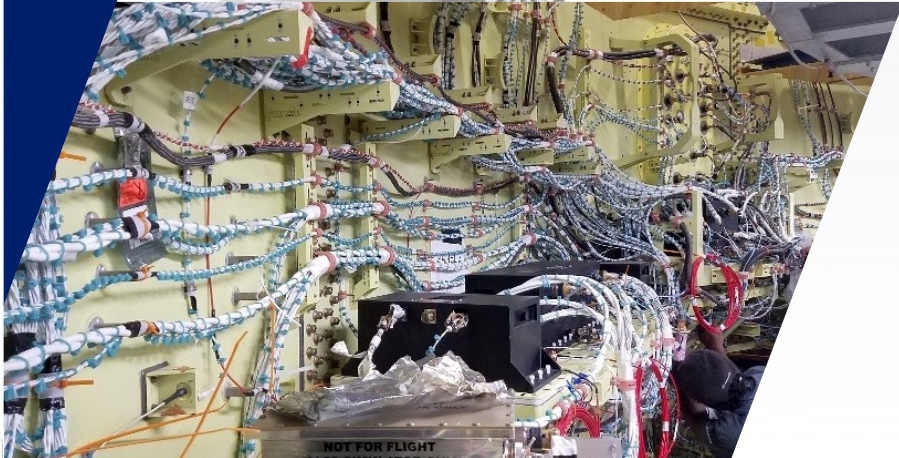
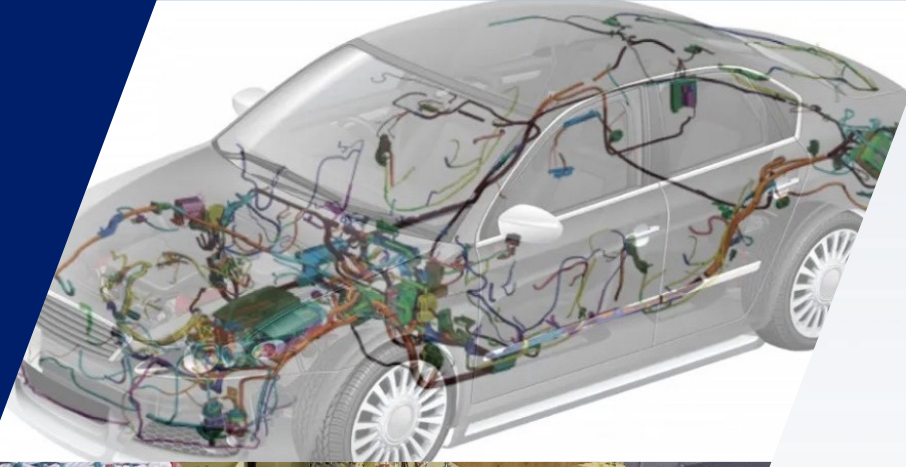




Alternatives to THV for Wire and Cable

AGC Chemicals Americas, Inc.



We Will Discuss:

- AGC Fluon+™ AR Flexible Compounds
- AGC Fluon® LM ETFE

Your Dreams, Our Challenge

THV is in Short Supply

- Demand is high
- Price is high (due to high demand)
- Lead times are long (due to high demand)

...but there are alternatives.

Some even out-perform THV

Your Dreams, Our Challenge

What are Fluon+ AR Products?

- Blends of ETFE with fluoroelastomer
- Easy to process (same as ETFE)
- Per cent of elongation at break is much greater than for ETFE
- Flexural modulus is much lower than for ETFE
- Can be cross-linked by electron beam or other high-energy radiation sources

Advantages of Fluon+ AR Products

- Resistant to attack from most chemicals
- Rugged vs. std. fluoroelastomers
- Wide service temperature range (up to 200 deg. C)
- Raw materials are much more available than for THV
- Can be custom-tailored to meet individual applications in wire and cable



Your Dreams, Our Challenge

What is an LM ETFE ?

- ETFE with lower melting point and lower processing temperatures than standard ETFE
- Three different MFI versions are available

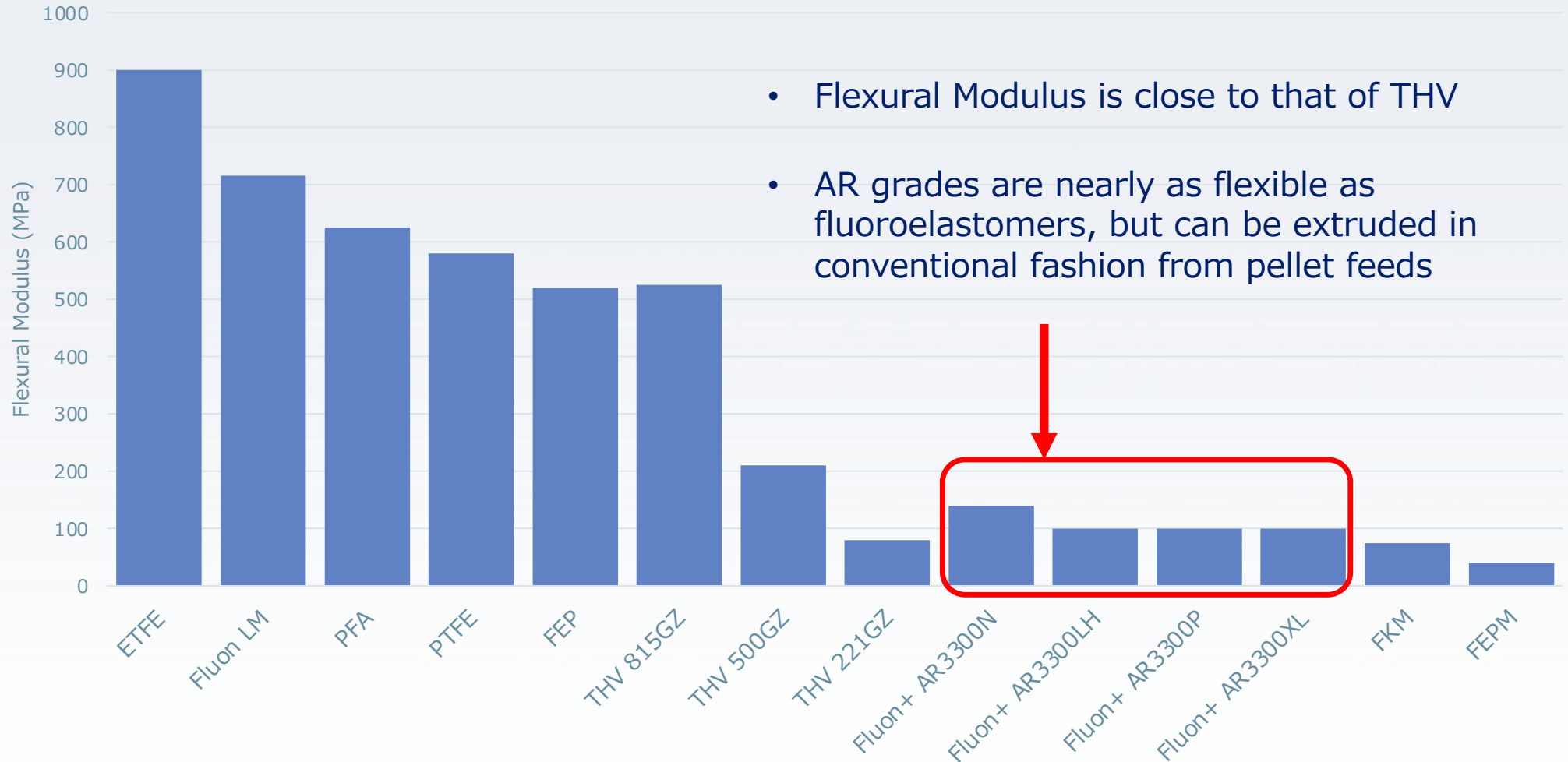
The Fluon LM-ETFE logo is located in the bottom right. It features a stylized graphic of five green circles of varying sizes arranged in a cluster to the left of the text 'Fluon' in a bold, blue, italicized sans-serif font. To the right of 'Fluon' is 'LM-ETFE' in a green, sans-serif font, with a registered trademark symbol (®) preceding 'LM'.

Advantages of Fluon LM ETFE vs. Standard ETFE

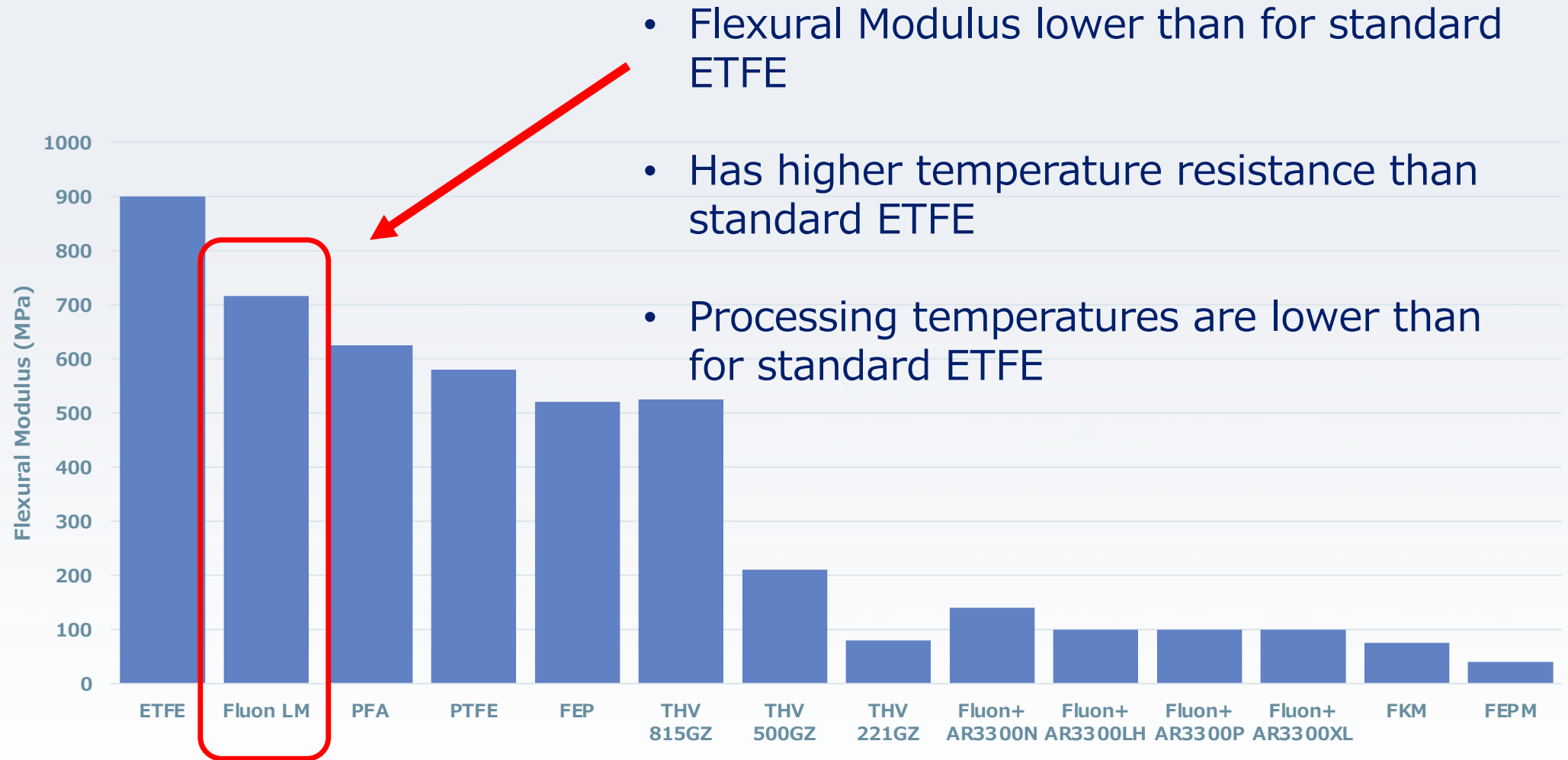
- Higher transparency
- Slightly more flexible
- Lower melting temperatures
- Lower processing temperatures
- Higher throughput rates on extruder (at same melt temperature)
- Better resistance to stress cracking
- Higher limiting oxygen index (less flammable)



Flexural modulus of various fluorinated materials



Fluon+ AR ETFE

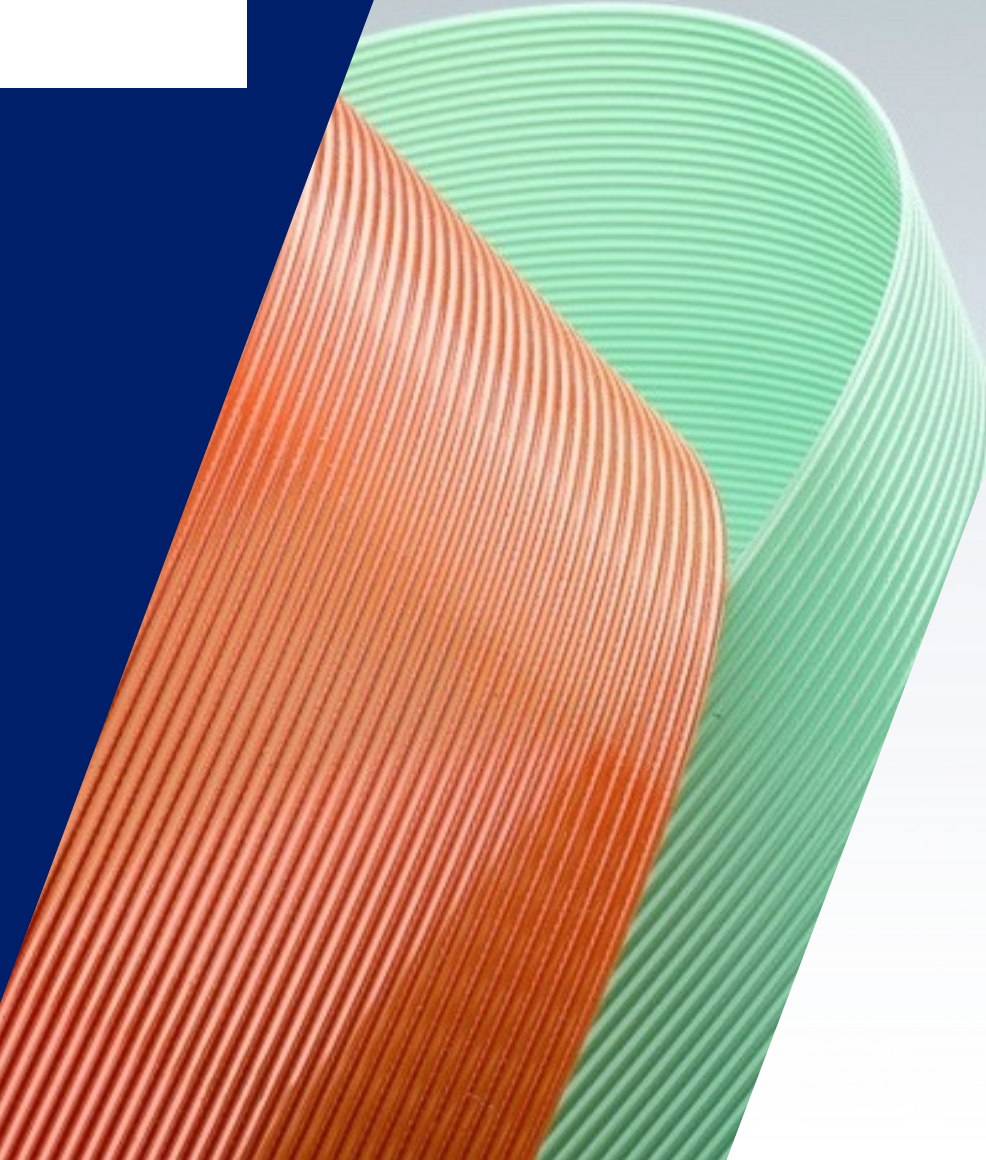


Use Fluon+ AR Grades For

- Ultra-flexible wire and cable (or tubing)
- Resistance to chemicals
- Applications requiring good opacity
- High/extended service temperature applications
- Applications requiring a custom-tailored solution to enhance physical properties, service temperatures, etc.

Your Dreams, Our Challenge

Use Fluon LM ETFE Grades For

- 
- A large, curved section of Fluon LM ETFE tubing is shown on the left side of the slide. It is composed of two distinct parts: an orange-colored outer layer and a green-colored inner layer. Both layers have a fine, ribbed texture. The tubing is curved into a gentle arc, showing its flexibility. The background behind the tubing is a light gray with a diagonal split.
- Flexible wire and cable (or tubing)
 - Resistance to fuels and chemicals
 - Applications requiring good transparency
 - High/extended service temperature applications
 - Applications that require good abrasion resistance and toughness

Your Dreams, Our Challenge

Fluon+ AR and Fluon LM ETFE vs. THV and ETFE

Material	THV	ETFE	LM ETFE	FLUON+ AR
Specific Gravity	1.93-2.06	1.73	1.78	1.62-1.64
Tensile Strength	moderate to high	very high	high	Moderate to high
Elongation	high	Low to moderate	moderate	high
Flexibility	moderate to high	low	moderate	high
Flammability UL94	V-0	V-0	V-0	V-2 to V-0
Appearance	Transparent	Transparent	Transparent	Opaque

Your Dreams, Our Challenge

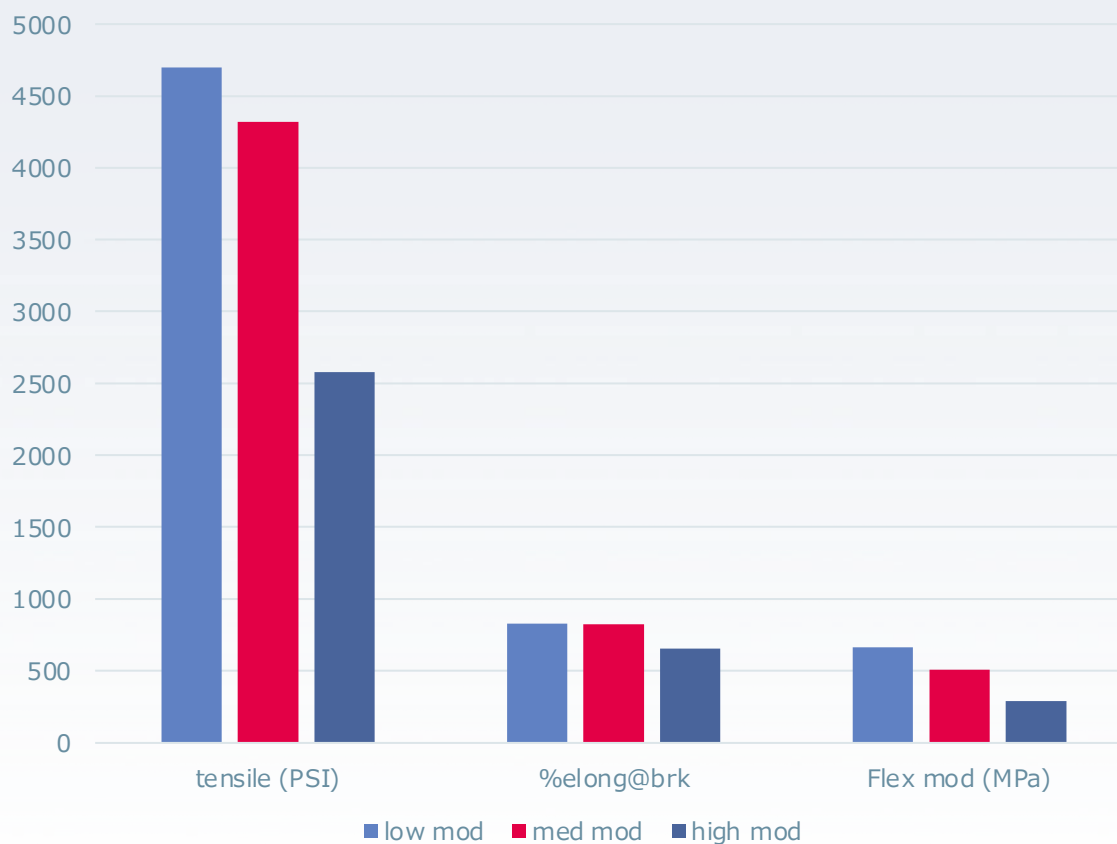
Overview of Fluon+ Products

GRADE:	AR-3300N	AR-3300P	AR-3300XL	AR-3300LH
Recommended use	General purpose	V-0 UL rated for flame retardancy	Radiation curable (for extended life)	Enhanced adhesion to metals and other plastics
MFI	9.0	8.0	9.0	9.0
Service Temperature	150° C	150° C	200° C (after cure)	150° C

AGC Chemicals Americas can also custom tailor the Fluon+ AR products to your individual applications

Benefits to Custom Compounding

Modifier level vs tensile, elongation and flex mod
Fluon+ AR series; high temperature ETFE



Higher modifier level =>
Greater flexibility

Your Dreams, Our Challenge

Fluon+ AR Grades Can Be Radiation Cured

Fluon+ AR-3300N Typical Properties

Property	Test Method	Units	Fluon+ AR-3300N	With EB irradiation 120 kGy
Melt Flow Rate (MFR)	ASTM D-2116	g/10min	8.7	NA
Melting Point	AGC Internal	°C	225	NA
Tensile Strength	ASTM D638	MPa	10.4	29.3
Tensile Elongation	ASTM D638	%	441	366
Flex Modulus	ASTM D790	MPa	141	148
Durometer Hardness	ASTM D1706	Shore D	42	44
Flammability	UL 94		V-2	V-2

- Elongation decreases a small amount
- Tensile strength increases significantly

Fluon LM ETFE Products Overview


GRADE:	LM-720A	LM-730A	LM-740A
Recommended use	General purpose extrusion / injection molding; Better stress crack resistance over LM-730A	General purpose extrusion / injection molding	General purpose extrusion / injection molding; higher flow than LM-730A
MFI	10 – 20	20 – 30	30 - 40
Service Temperature	150°C	150°C	150°C

Available Colors

- Specifically designed for use in coloring Fluon+ AR and Fluon LM ETFE
- Custom color matching capabilities

Your Dreams, Our Challenge

AGC Chemicals Flexible Resins

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- A photograph showing various colored granules of AGC Flexible Resins. In the foreground, there are piles of yellow, purple, and light blue granules. A small glass jar filled with green granules sits in the center. In the background, there are more piles of blue and orange granules. The entire image is set against a dark background with a blue diagonal stripe on the left side.
- AGC offers two products to replace THV, depending on specific application requirements.
 - All solutions provide improved flexibility over traditional ETFE.
 - The AR series offers similar or superior flexibility to THV.

Fluon+ AR and LM ETFE also offer:

- High resistance to heat
- Excellent chemical resistance
- Physical toughness
- Outstanding resistance to weather and aging
- Good dielectric properties



AGC

Contact Us for More Information



Learn more
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