New **AFLAS®** Fluoroelastomers: Advanced Polymers for Today's Toughest Applications

Your Dreams, Our Challenge

Fluoroelastomers have the highest heat resistance of all synthetic rubbers, which gives them a distinct advantage in challenging applications. AFLAS® fluoroelastomers are a unique material composed of alternating units of tetrafluoroethylene (TFE) and propylene.

Classified as FEPM-type elastomers, AFLAS grades have outstanding chemical and heat resistance. These characteristics make them ideal materials for parts and components in chemical plants, food processing plants, cars, wires, cables, and downhole oil & gas equipment. AFLAS grades also make it possible to manufacture cables that can conduct high electrical currents with relatively thin insulation layers.

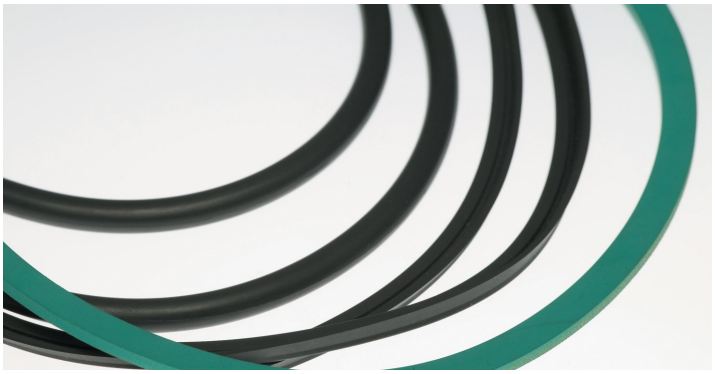
AGC's latest grades, **AFLAS 600X** and specialty FKM **AFLAS 200P BRE**, provide base resistance, compression set and mold release advantages over other Type VI FKMs.

Performance characteristics:

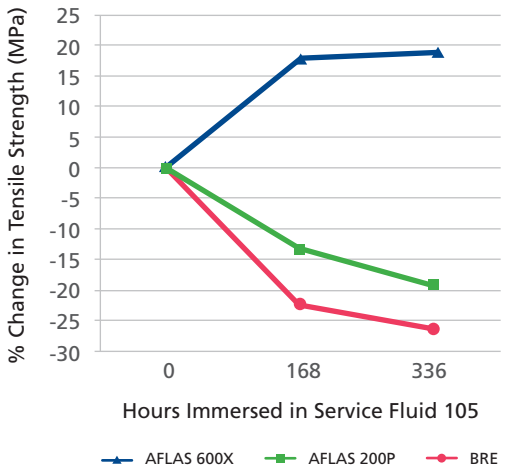
- Resistant to bases, acids and oils
- Resistant to high pressures with continuous use temperature of 200 °C.
- Resistant to aqueous caustic soda, ammonia water and alkaline chemicals like TMAH and NMP
- Electric insulation properties (10^{16} Ω.cm)
  Mechanical strength

AFLAS® VS. TYPE VI FKMS

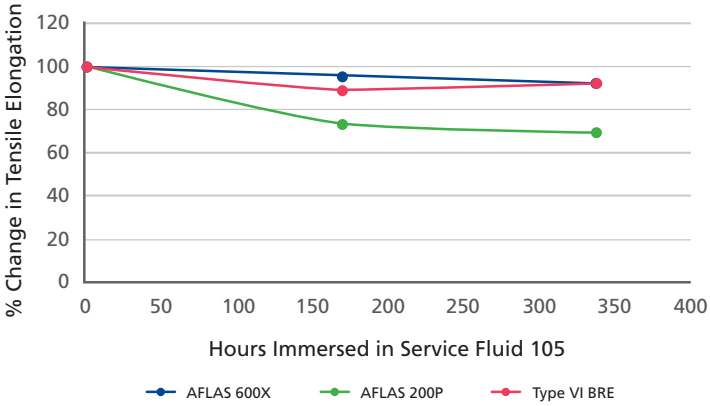
Formulation	Units	AFLAS 600X	AFLAS 200P (Formulation A)	AFLAS 200P (Formulation B)	TYPE VI FKM (Low-Viscosity Grade)	TYPE VI FKM (High-Viscosity Grade)
Polymer	phr	100	100	100	100	100
MT 990 Carbon		30	25	25	20	20
TAIC (100% active)		5	5	5	4	4
Perkadox® 14S-fl		1	1	1.5	–	–
Calcium Stearate		1	–	–	–	–
Sodium Stearate		–	1	1	–	–
Perhexa 25b		–	–	–	–	1.5
Acid Receptor		–	3	3	–	–
Ricon® 153D		–	–	3	–	–
Curing Properties (RPA 2000), ASTM D 5289						
Test Temperature	°C	160	177	177	160	160
Cure Time	min	7	7	7	5	5
Mechanical Properties, ASTM D 412, ASTM D 2240, ASTM D 297						
100% Modulus	MPa	6.0	5.0	7.0	1.9	1.8
Tensile Strength	MPa	23.0	18.0	18.1	23.1	20.9
Tensile Elongation	%	220	270	225	570	610
Hardness (Shore A)	Points	72	68	74	61	59
Specific Gravity	–	1.56	1.65	1.65	1.73	1.73
Comp Set, Button (200 °C, 70 hrs.)	%	14	23	19	–	–
Comp Set, P-24 O-Ring	%	27	–	–	28	31
TR-10	°C	3	-8	-8	-12	-12
Max Use Heat	°C	230	230	230	180	180



TENSILE STRENGTH RETENTION:
AFLAS 600X & 200P vs. TYPE VI FKMs



TENSILE ELONGATION RETENTION:
AFLAS 600X & 200P vs. TYPE VI FKMs



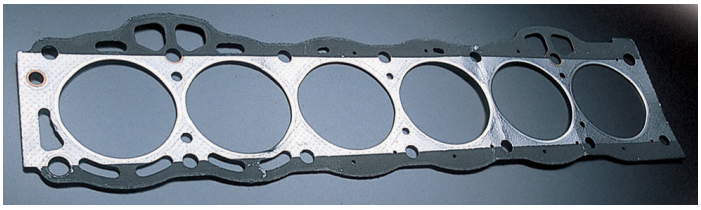
AFLAS 600X - SUPERIOR COMPRESSION SET AND MOLD RELEASE

AFLAS 600X FEPM offers performance and processing advantages over BRE, FKMs and other AFLAS grades including:

- Superior mold release
- Higher cross-linking ability
- Improved processing and excellent compression set
- Faster cure speed (4-10 hour post cure), T90 around three minutes, which is similar to FKMs, AEMs and VMQs

AFLAS 600X is ideal for molded parts like durable packers, bladders, gaskets and O-rings that work in wet, high-pressure, amine- and base-rich environments. The parts will not deteriorate under prolonged exposure at 230 °C, and exhibit excellent electrical and thermal resistance.

AFLAS 600X is also able to co-cure with other materials, making it possible to use a multilayer construction instead of a full fluoroelastomer hose without sacrificing the technical performance or the lifetime of the part. When AFLAS 600X is used as the inner layer, hoses can withstand high-pressure, high-temperature areas around the engine where they are exposed to NOx, SOx, engine oils and other aggressive fluids.

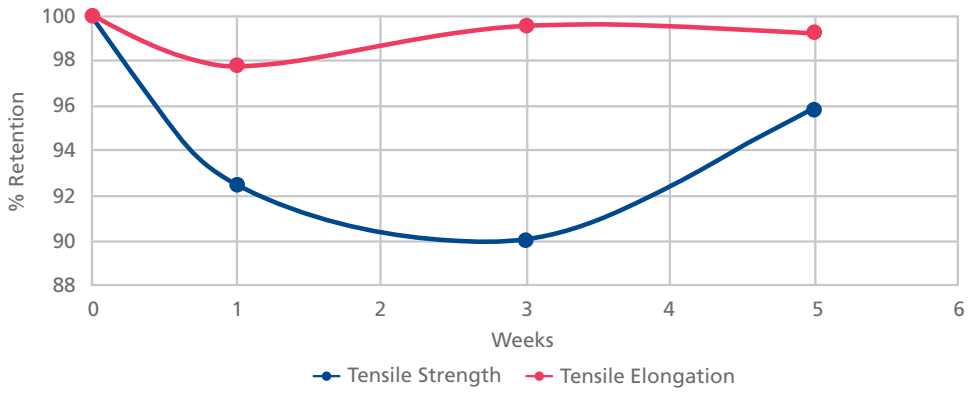


AFLAS 200P - LOW-TEMPERATURE, BASE-RESISTANT ELASTOMERS

AFLAS 200P specialty FKMs are peroxide curable. They perform better than conventional FKM-type fluoroelastomers for applications that need to withstand aggressive oils containing antioxidants, solvents, ozone, acids and bases. Classified by ASTM D 1418-01 as TYPE IV FKM base-resistant elastomer, AFLAS 200P grades offer improved heat tolerance and performance at cold temperatures (Tg = -13 °C, TR-10 = -8 °C).

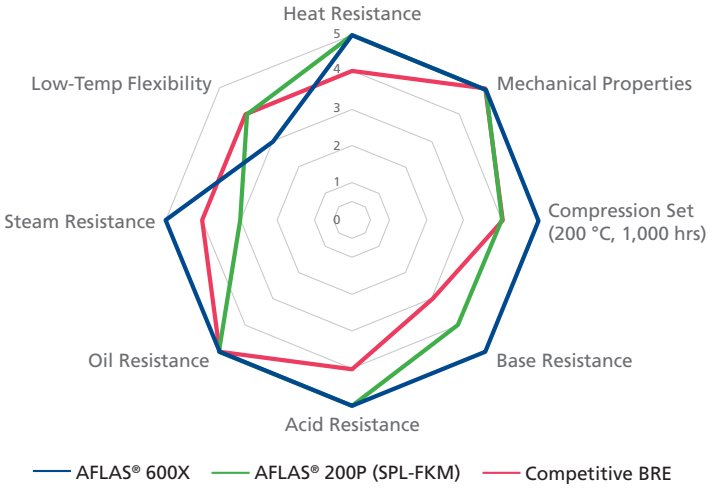
These grades are ideal for oil seals, shaft seals, O-rings, gaskets and a variety of other parts and fittings. They can also be used in chemical processing or industrial applications. Additionally, they can be solvated and applied as a coating.

AFLAS 600X vs. 50% NaOH at 100 °C
5 WEEK IMMERSION



APPLICATIONS FOR AFLAS 600X AND 200P

- Oil seals
- Downhole applications
- Sour gas (H_2S-rich) environments
- Areas with rapid gas decompression (RGD/ED)
- Automotive hoses including intercooler hose, oil cooler hose, turbo charger hose and coolant hose
- Axle shaft seals
- Radial shaft seals
- Pinion shaft seals
- O-rings for alkaline/acid chemicals
- Rubber-coated metal gaskets



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