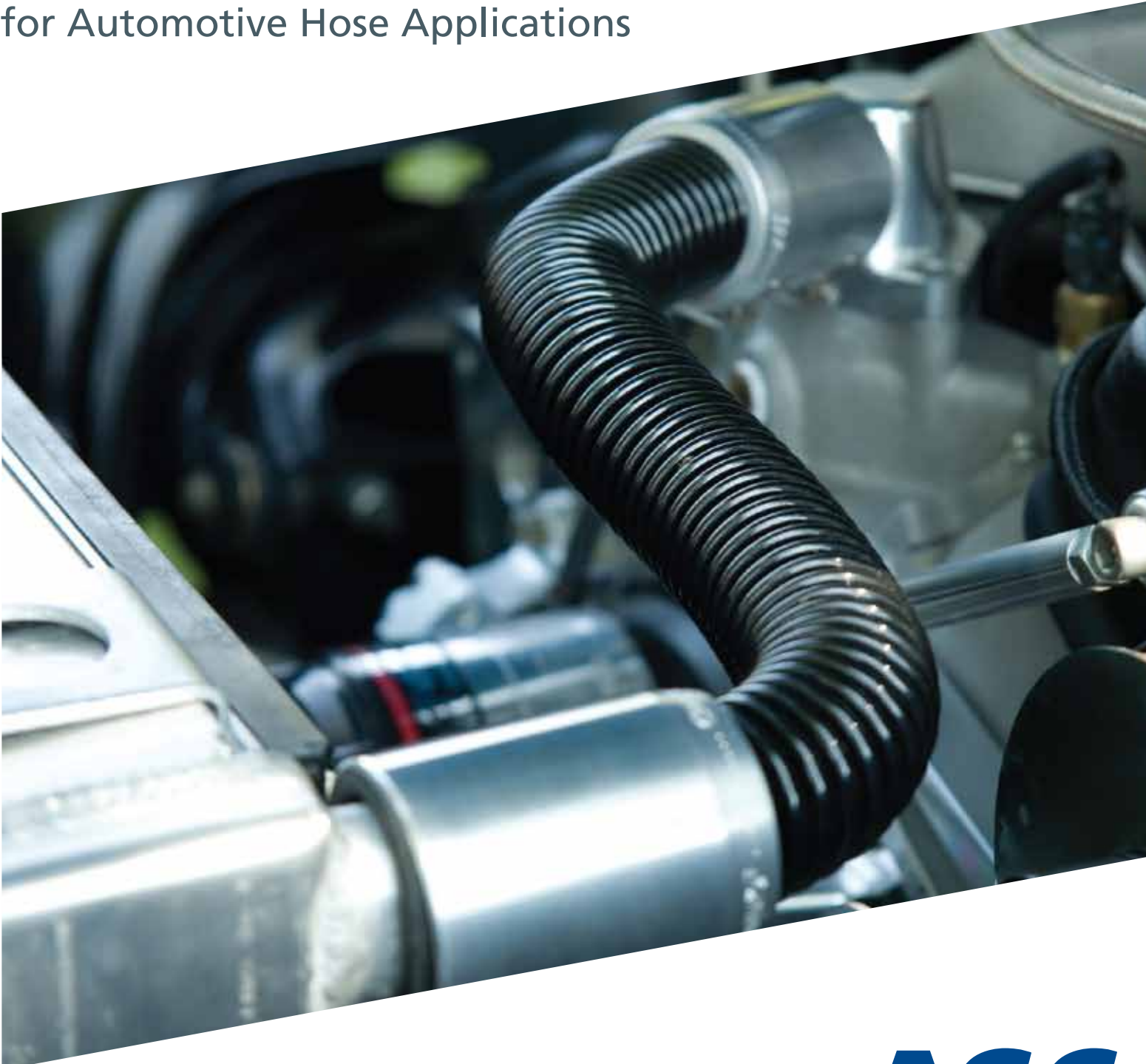




## Lamination to other Elastomers for Automotive Hose Applications



Your Dreams, Our Challenge

## AFLAS® Fluoroelastomers for Automotive Hose Applications

AGC has developed AFLAS® FEPM grades designed for a new lamination technology for multi-layer hose constructions. This multi-layer technology using AFLAS® grades 400E and 600X is ideal for use in high-pressure, high-temperature areas around the engine where hoses are exposed to NOx, SOx, engine oils or other aggressive automotive fluids.

Trends including engine and turbo efficiency improvement, fuel consumption improvement and environmental regulation changes are requiring better equipment and new technology over existing constructions of layered materials such as acrylic rubber (ACM, AEM), silicone rubber (VQM) and FKM.

### Benefits of AFLAS® 400E and 600X

- Heat, oil, acid and base resistance
- Can be laminated directly to dissimilar elastomers
- Excellent amine and steam resistance
- Continuous use temperatures of 200°C or higher
- Improved compression set (600X)
- Peel strength of > 7N/25mm at 150°C
- Rapid cure, colourable, easier processing

### AFLAS® Multi-Layer Hose Technology

- Inner layer: AFLAS®
- Intermediate layer: AEM, ACM, VKM or FKM
- Textile reinforcement
- Outer cover

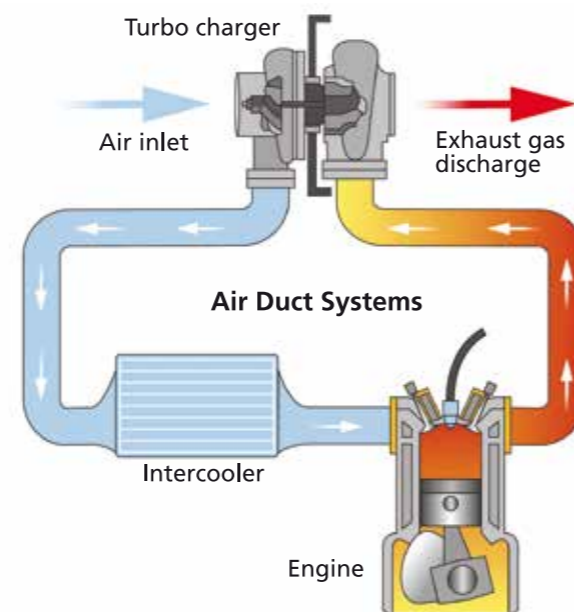


### Common Conditions

- High pressure
- High temperature
- Blow-by gas
- NOx, SOx (organic acid)
- Oil mist of engine oils
- Coolant, ATF
- Steam, hot water

### Applications

- Intercooler hose
- Oil cooler hose
- Oil return hose
- Blow-by hose
- PCV hose
- EGR hose
- Turbo charger hose
- Turbo water cooling hose
- CAC hose
- ATF hose
- Coolant hose

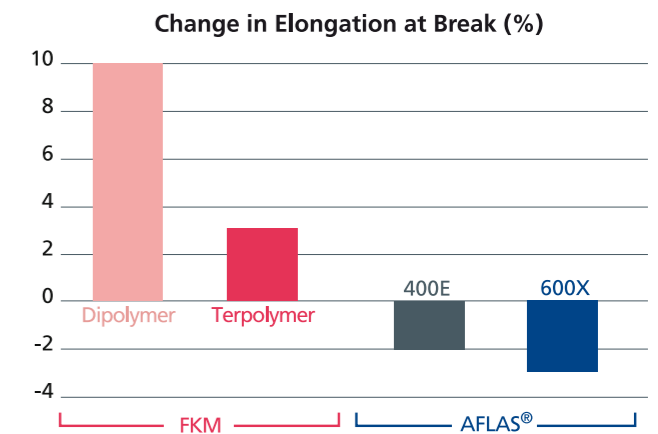
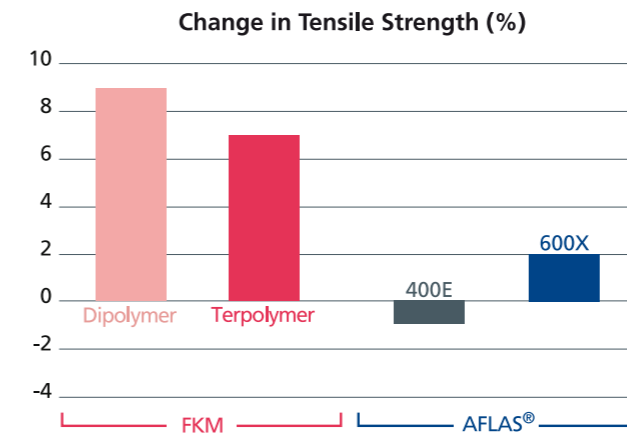


## Benefits of AFLAS® vs. FKM

Engine oils resistance test in actual conditions and applied GM's standard for testing GMW 15408:

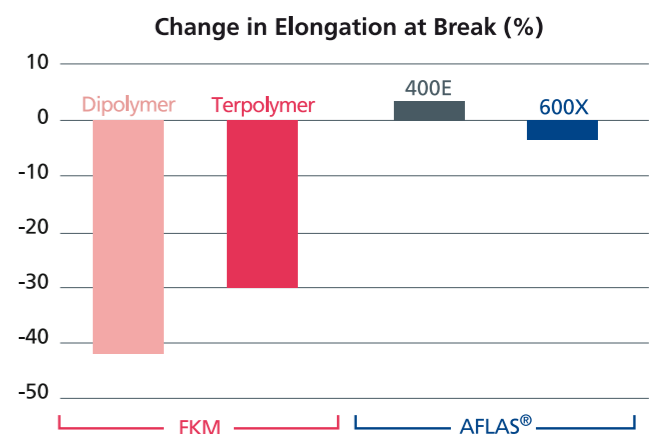
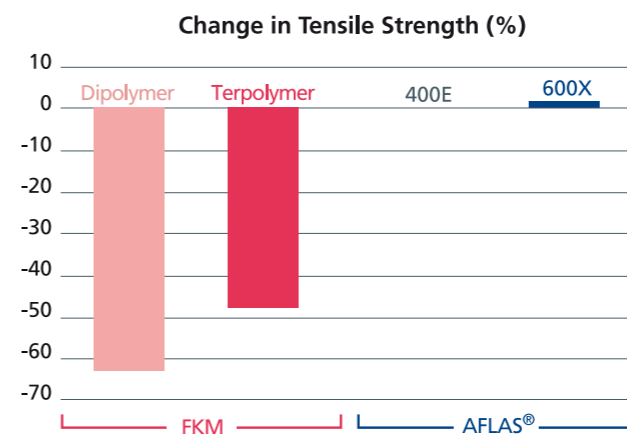
- Turbo charger hoses with high temperature resistance
- Aged engine oils preparation for 72h at 175°C
- Oils resistance test by immersion in aged engine oils for 168h at 175°C

### 0W20 (Oil Reference)



- Notable changes occur with tensile strength and elongation observed with the FKM due to scission substances attacking the polymer
- AFLAS® has much higher durability compared to FKM

### 10W60 (Oil Reference)



## AFLAS® Performance in Engine Oil, Fluids and Steam

Product Name	Temp (°C)	FKM	AFLAS®
Engine oils	150	Caution	Suitable
Aged engine oils	175	Not applicable	Suitable
AT fluids	160	Caution	Suitable
Gear oils	135	Not applicable	Suitable
Brake fluid	135	Applicable	Applicable
Coolants 50% LLC	160	Caution	Suitable
Hot steam	180	Not applicable	Suitable

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It is the responsibility of the purchaser to check that the specification is appropriate for any individual application. Particular care is required for special applications such as pharmaceutical, medical devices or food. It is advisable to contact the AGC Chemicals sales office for the latest position. Users of AFLAS® are advised to consult the relevant health and safety literature which is available from the AGC Chemicals sales office.