

AGC

AsahiGuard
E-SERIES

A new generation of fluorinated
water/oil/alcohol repellent



bluesign®

SYSTEM
PARTNER

AGC Chemicals
Chemistry for a Blue Planet

AGC - THE FIRST COMPANY TO FULLY CONVERT TO PFOA-FREE* WATER & OIL REPELLENT

FLUOROTELOMER BASED C6 TECHNOLOGY

AsahiGuard E Series is a fluorinated water and oil repellent providing sustainable alternatives for many applications, including paper packaging, textiles, apparel, non-wovens, natural and synthetic leathers and home furnishings based on proven AGC C6 chemistry.

AsahiGuard E-Series offers high performance properties with improved environmental and biological profiles.

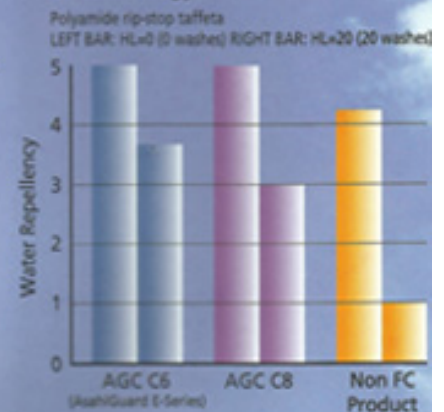
Products in the AsahiGuard E-Series range are PFOA-free* (free of perfluorooctanoic acid)
(* at or above detection limits)

What is C6?

Alternative short-chain C6 PFC versus long chain C8 PFC

- C6 fluorinated polymers are proven safe for their intended use.
- Evaluated by industry and regulators who provide data showing that they are safe and effective.
- C6 fluorinated polymers cannot break down to form PFOA or PFOS.
- AGC switched entirely to C6 based fluorochemistry from C8 fluorochemistry in 2012, which was 3 years ahead of the Environmental Protection Agency's 2010/2015 PFOA Stewardship Programme's timetable for the phase-out.
- Innovative AGC C6 WOR technology.
- Full product range to meet all performance demands.
- Continued C6 based product development and performance innovation.
- AsahiGuard E-Series adds value and performance for advanced textiles.

C6 from AGC performs better than other technology



Conditions:
Fluorocarbon (2% solid) with Block Isocyanate, Melamine Resin and Catalyst 1d-1n, Drying 120 seconds @110°C, Curing 60 seconds @170°C
Evaluation:
Water Repellency (ISO4920:2012 (Spray Test))
Home Laundry (HL) JIS1052:2009 6.2.1(a) C method, Line Drying before Evaluation



Industrial Workwear



AsahiGuard E-Series is ideal for tough and durable coatings for workwear in contact with oil and dirt such as in the automotive and chemical industries. Fabrics made using AsahiGuard are comfortable to wear and highly durable for industrial laundering. Not only clothing but also accessories such as gloves, work boots and shoes can be protected with AsahiGuard.

AsahiGuard E Series is not only used for technical textiles in applications like automotive noise insulation and the interior of car roofs, but also for automotive and industrial parts, as well as air and oil filters.



Outdoor Leisure & Sportswear



AsahiGuard E-Series provides a waterproof coating for outerwear and footwear designed for activities such as skiing, rambling, mountaineering and sailing.

These waterproof characteristics mean it is widely used on tents, awnings and canopies to give protection from the elements.



Medical, Emergency Services, Police and Army



Offering water, oil and alcohol repellency AsahiGuard is suitable for use on operation scrubs, medical gowns, surgical drapes, surgical face masks, laboratory wear and items that have to be sterilised in the medical industry.

AsahiGuard is used on durable yet lightweight fabrics in the emergency response and military sectors.

Those working in demanding environments need the protection of tough durable, waterproof fabrics and AsahiGuard fits the bill.



Food Packaging

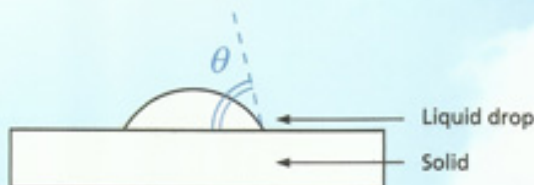


AsahiGuard can be used either at the wet end or the size press end in paper production for imparting grease proof performance to paper products. It is used in many applications in the food and drinks packaging industry. It is unscented and gives a high quality, food contact use approved, non-stick, breathable barrier to water, oil and grease and offers added durability to paper, board and moulded fibre products.

Typical applications include fast food boxes, bags and wrappers, paper tableware, dry pet food packaging, paper trays and containers.



Surface Tension - Water and Oil Repellency



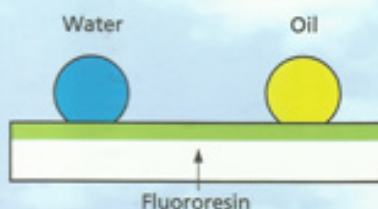
Whether an object tends to become wet or not is determined by its surface tension. When a liquid touches a solid surface it is repelled to form beads if the surface tension of the liquid is larger than the surface tension of the solid. The solid becomes wet if its surface tension is larger than the surface tension of the liquid.

Surface Tension of Fabric >
Surface Tension of Water



Fabric becomes wet because its surface tension is higher than that of water.

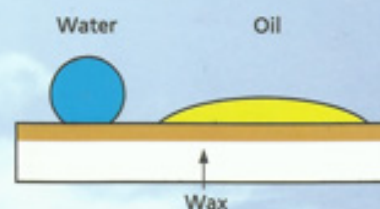
Surface Tension of Water >
Surface Tension of Oil >
Surface Tension of Fluororesin



The surface tension of fluororesin is very low, therefore fluororesin repels water and oil.

AsahiGuard has particularly low surface tension.

Surface Tension of Water >
Surface Tension of Wax >
Surface Tension of Oil



Wax is used as a water repellent because of its low surface tension, however wax does not repel oil, since oil has a lower surface tension.

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Grade Range

Aqueous Dispersion type

| Product name | Solid Content | Ionic Character | Principal Use | Product Properties |
|--------------|---------------|-----------------|---------------------------------------|---|
| AG-E060 | 20% | Mildly Cationic | Food Packaging; Paper Applications | AG-E060 and AG-E070 give outstanding water and oil proof properties to paper, paperboard and moulded products in various papermaking conditions. Suitable for a whole host of food packaging thanks to FDA and BfR compliance. |
| AG-E070 | 25% | Mildly Cationic | Food Packaging; Paper Applications | |
| AG-E080 | 15% | Anionic | Food Packaging; Paper Applications | AG-E080 gives outstanding water and oil proof properties to paper, paperboard and moulded products in a range of papermaking conditions. AG-E080 is FDA compliant according to FCN 1186 (Conditions of use B-H). BfR approval of this grade is pending. |
| AG-E100 | 20% | Mildly Cationic | Workwear, Uniforms | A "next generation" product that imparts good oil repellency and stain release properties in conjunction with machine washing. May be used for polyester, cotton or cotton/poly blends. |