

DuPont™ Capstone™ 315

FLUORINATED ACRYLIC COPOLYMER

LEATHER APPLICATIONS

Description

DuPont™ Capstone™ 315 is an acrylic fluorinated emulsion used for finishing of leathers in drums and by spray. It is also suitable for the formulation of leather-care products. Capstone™ 315 is based on six fluorinated carbon molecules that cannot break down to PFOA in the environment.

Features

- Excellent water repellency
- Excellent oil repellency
- Excellent resistance to water and oil-based stains
- Meets the voluntary "EPA 2010/15 PFOA Stewardship Program" targets for PFOA
- Targeted below LOD* for PFOA

Capstone™ 315 has no impact on:

- the shade or suppleness of the skin
- the aesthetic properties of the leather

Typical Characteristics

Please refer to the product specifications data sheet for guaranteed commercial specifications.

Appearance	White liquid
Type	Anionic
Active contents, %	30
Density at 20°C (68°F)	1.03
pH	4.5–6.5
Flash point (closed cup)	None
Freeze/thaw stability	None
Boiling point, °C (°F)	Approx. 100 (212)
Freezing point, °C (°F)	–5 (23)

* Below the limit of detection (LOD) based on the published analytical method found in *The Journal of Chromatography A*, 1110 (2006) 117–124.

Handling and Storage (see Safety Data Sheet)

Capstone™ 315 must be stored in original closed drums at temperatures of 5–40°C (41–104°F).

Minimum storage stability under normal conditions: 6 months.

Formulating Guidelines

Capstone™ 315 is particularly effective in making the following items oil- and water-repellent:

- lambskin, sheepskin, nappa and suede for garments and gloves
- calf suedes
- suede splits
- double face woolskins
- full grain sides
- vegetable tanned leathers

Drum Applications

To achieve optimum results, the Capstone™ 315 treatment should take place in the last stage of the wet process. Capstone™ 315 can also be blended into the anionic fat liquor bath. For two-stage fat liquoring operation, Capstone™ 315 can be used in two feeds along with fat liquors. A final pH of 3.2–3.5 should be maintained at the end of process. Although temperature has very little impact on the performance of Capstone™ 315, we recommend working at 50°C (122°F), as this temperature allows reproducible results.

Capstone™ 315 imparts repellency characteristics, even with low-cost nonwaterproof fat liquors, even if we recommend the use of a waterproof fat liquor when high protection is required. The efficiency of the product is found to be much better when the fiber structure of the leather is more opened up (longer liming) and when the thickness of leather is relatively low.

4–6% of DuPont™ Capstone™ 315 (on wet-blue weight) is recommended to obtain an oil repellency value of 3–4 (AATCC 118 test) and a water repellency value of 4–5 (water/IPA test). Some improvements of performance and aesthetic properties of leather can be achieved by introducing Capstone™ 315 mixed with fat liquor in two feeds: first, 75% of the blend is introduced, then fixation with formic acid to reach pH 4.5; then, 25% of the blend is introduced before fixing with formic acid to reach pH 3.5. It is also possible to fix Capstone™ 315 with a final treatment using Foraperle® 321, a cationic fluorochemical compound.



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Finishing Applications

Grain Leathers

Capstone™ 315 can be applied either by spray or roller-coater along with topcoat. Typical quantities to achieve 1 g/ft of Capstone™ 315 are 5–10 parts Capstone™ 315 in 100 parts of topcoat (for 10–20 g/ft of topcoat sprayed). This product can be used along with a conventional topcoat (nitrocellulose lacquer emulsion or polyurethane dispersion) and imparts to leather an oil repellency value of 4–5 and a water repellency value of 5–6.

Suede/Nubuck Leathers

Capstone™ 315 finds application to upgrade suede and nubuck leathers and provide them water- and oil-repellent properties without altering the aesthetic properties of the leather. 1 g of Capstone™ 315 for 1 ft² of leather (5% solution of Capstone™ 315 in water along with suitable crosslinker or additive) is sprayed to obtain an oil repellency value of 4–5 and a water repellency value of 5–6.

Uses of Capstone™ 315

	Drum Application	Finishing Application
Garment	With 3–5% of Capstone™ 315: up to repellency: WR = 4; OR = 3	Water-based topcoat: nitrocellulose or polyurethane-based 5 parts Capstone™ 315 in topcoat Deposit: 1 g/ft Capstone™ 315 Possibility to use crosslinkers up to repellency: WR = 6; OR = 5
Upholstery	With 3–5% of Capstone™ 315: up to repellency: WR = 4; OR = 3	
Shoe Upper	Lined shoes Specially for thin leathers Two feeds process with 5% of Capstone™ 315 (4 + 1%) Better distribution for softy upper leathers Mixed with waterproof fat liquor suitable for water resistance up to repellency: WR = 4; OR = 3	
Suede and Nubuck	Two feeds process Thickness to be controlled With 3–5% of Capstone™ 315: up to repellency: WR = 4; OR = 3 Fixing stage with DuPont™ Foraperle® 321 to get more softness and a better hand	Spray: 5% of Capstone™ 315 dilute in water Deposit: 1 g/ft Capstone™ 315 up to repellency: WR = 6; OR = 5 No alteration of the nap with the use of auxiliaries

WR = Water Repellency (water/IPA test); OR = Oil Repellency (AATCC 118 test)

Typical Application Method

One-Step Treatment Mixing Capstone™ 315 with Fat Liquors

Suggested procedure for 100 kg of wet hides (wet-blue):

1. Retan, dye, drain, rinse.
2. Add 150 kg of hot water (50°C [122°F]).
3. Add 8–10 kg of fat liquor (such as Münzing's Ombrellon WR), and rotate for 60 minutes.
4. Add 4–5 kg of Capstone™ 315, and rotate for 60 minutes.
5. Acidify the bath with diluted formic acid to obtain a pH of 3.0–3.5, and rotate for 20 minutes.
6. Add 2 kg of chromium salt, and rotate for 60 minutes.
7. Rinse with plenty of cold water.
8. Dry.

Formulating Leather-Care Products

Spray Application for Finishing

Capstone™ 315 is generally used in leather finishing solution at a ratio of 3–5% of commercial product in water. If needed, the addition of a 5 wt% of co-solvent (ethylene glycol) facilitates the application. The usual deposit is 0.5–2 g of dry Capstone™ 315 per square meter of leather. Dry at room temperature. However, it is recommended to dry the skins for 1 hour at 50°C (122°F).

Shoe Cream and Polish Application

Waxes, creams, and polishes for all leather articles (shoes, garments, furnishing). This formulation consists of two mixtures; the quantity of each ingredient is expressed in parts per thousand.

Mixture 1		Mixture 2	
Natural or vegetable wax	100	Potassium carbonate	7
Paraffin	7	Borax	3
Nonionic surfactant	7	Hot water	640
Terebinthine	66	(80–90°C [176–194°F])	
White spirit	120	Capstone™ 315	50

Under stirring, pour mixture 1 into mixture 2 and then cool to 30°C (86°F).

Spray Application (aerosol)

Spray formulation example with Capstone™ 315

Water, g	65
Capstone™ 315, g	5
Dimethylether, g	30

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