

INTRODUCTION

Per- and polyfluoroalkyl substances (PFAS) are a class of thousands of substances that have been produced since the 1940s and the discovery of polytetrafluoroethylene (PTFE). Due to their **highly stable carbon-fluorine bonds** and **unique physicochemical properties** (anti-adhesion, water-proofing, heat-resistance, etc.), PFAS are **widely used** in a broad range of consumer products and industrial applications such as textiles, anti-adhesive coatings or food packaging. However, with growing concern about the impact of PFAS on **human health and environment**, regulations for their use and production are becoming increasingly stringent. Thus, replacing PFAS with **fluorine-free solutions** has become a key requirement for the market.



At SPECIFIC POLYMERS, we use our expertise in polymer chemistry to **develop innovative PFAS-free solutions** for **coating applications**. **SP-3834_V1** is a **solvent-based polyurethane topcoat** specifically designed to substitute PFAS in **anti-adhesive and repellent coatings**. **SP-3834_V1** can be used as a **protective and self-cleaning coating** in different applications, such as solar panel, wind blade, etc. In fact, beyond water and oil repellency, **SP-3834_V1** provides **light stability**. Furthermore, its **high flexibility** allows it to be suitable for **various substrates**. Thanks to its **good adherence** to metallic substrates, **SP-3834_V1** can also provide an effective barrier and **protect metal surfaces** from environmental damage.

KEY FEATURES

1. Fluorine-free polyurethane-based formulation
2. Water and oil-repellent
3. High flexibility ($T_g < 0^\circ\text{C}$)
4. Good thermal stability (290°C)
5. Good adhesion on various substrates
6. Suitable for application by spray-coating

MAIN CHARACTERISTICS

Crude formulation		
Base (Part A)	Density (20°C)	0.978 g/cm ³
	Viscosity (25°C , 10s^{-1})	15 ± 1 cP
Mixed system	Density (20°C)	1.022 g/cm ³
	Solid content (by weight)	60%
	Pot life (ISOCUP#4, 20°C)	>7h



Coating properties		Surface properties		
Glass transition temperature T _g	-6 °C	Surface tension (mN/m)	20.34	
5% weight loss degradation temperature T _{5%}	295 °C	Polar component (mN/m)	0.44	
Recommended dry film thickness	~50µm	Dispersive component (mN/m)	19.90	
Coating aspect	Transparent glossy			

	Water	Hexadecane	Sunflower oil
Contact angle	105° ± 1	34° ± 1	55° ± 0
Roll-off angle	>90°	9° ± 0	35° ± 1

PROCESSING PARAMETERS

Mix ratio (by weight)	
Component A (Base)	100 parts
Component B (Hardener)	39.5 parts
Component C (Activator)	1.8 parts

Surface preparation and pre-treatment

Apply to a suitably prepared surface: the surface must be clean, dry and intact. Acetone can be used as a cleaning solvent.

Application method

The formulation can be applied by spray-coater.

Instructions for use

Before mixing the components, stir thoroughly or shake each part until smooth uniform solutions are obtained. Then, add the hardener (component B) and the activator (component C) to the base (component A). Stir thoroughly until a homogeneous mixture is obtained.

Recommended curing cycle

A flash off time of 30 min at room temperature is required before curing 4h at 100°C.

