

SAG* TP-325

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Description

SAG TP-325 silicone antifoam is based on a unique organosilicone structure, making it a new generation of antifoams for diesel fuel. SAG TP-325 silicone antifoam contains only 9.4% silicon.

Key Features and Benefits

- Enables longer storage stability for diesel fuels
- Permits fast and virtually complete filling of fuel tanks
- Helps maintain high performance in wet diesel fuel
- Minimizes silica deposits on fuel injection
- Provides excellent durability in wet and dry diesel fuels
- Requires low silicon level (one-half that of current state-of-the-art antifoam)
- Requires low usage levels – 5 ppm
- Quick foam knockdown
- Insoluble in water
- Halogen free

Typical Physical Properties

Appearance	Clear to slightly yellow
Form	Liquid
Apparent Specific Gravity at 20°C	1.03
Viscosity at 25°C, cSt	400
Refractive Index at 25°C	1.4450
Flash Point, Pensky-Martens Closed Cup, °C (°F)	103 (218)
Freezing Point, °C (°F)	<-32 (<-26)

Potential Applications

SAG TP-325 silicone antifoam is an excellent candidate for use in diesel additive packages (DAPs) and helps achieve cost-effective foam control of diesel fuels.

Processing Recommendations

In every case tested, SAG TP-325 silicone antifoam exhibited superior performance – at half the concentration – to the competitive state-of-the-art antifoam, especially in wet diesel fuel.

The performance of SAG TP-325 silicone antifoam and a competitive state-of-the-art antifoam was evaluated in various diesel fuels. The antifoams were incorporated in different DAPs at varying levels. These DAPs were added at 200 ppm to particularly high and low-foaming commercial diesel fuels and allowed to stand overnight in order to simulate typical use conditions. The studies were conducted according to the DHYCCA (Direction Française d’Hydrocarbures) test, which consists of injecting the diesel fuel at 1.5 bar into a graduated cylinder and measuring the collapse time.

The antifoams were evaluated in both “dry” diesel (50 ppm water) and “wet” diesel (1000 ppm water). The final concentration of SAG TP-325 silicone antifoam was 7.5 ppm for high-foaming and 5 ppm for low-foaming diesel fuel. The competitive antifoam concentration, based on supplier-recommended addition rates, was 15 ppm and 10 ppm, respectively. Results of the eight-week test are summarized in Table 1 (high-foaming) and Table 2 (low-foaming).

Relative defoam times are shown in Figures 1 and 2 for high-foaming diesel fuel and in Figures 3 and 4 for low-foaming diesel.

Table 1: Antifoam Performance in High-Foaming Diesel Fuel

Test Sample	Antifoam Level, ppm	Defoam Time, sec		Defoam Time (at 8 wks) Relative to Control, %
		Initial	After 8 wks	
Dry Diesel Fuel ⁽¹⁾				
Control (Neat Diesel)	—	62	78	—
With SAG TP-325 silicone antifoam	7.5	8	9	11
With State-of-the-Art AF	15	10	11	14
Wet Diesel Fuel ⁽²⁾				
Control (Neat Diesel)	—	56	78	—
With SAG TP-325 silicone antifoam	7.5	5	9	11
With State-of-the-Art AF	15	19	31	40

(1) 50 ppm water

(2) 1000 ppm water

Table 2: Antifoam Performance in Low-Foaming Diesel Fuel

Test Sample	Antifoam Level, ppm	Defoam Time, sec		Defoam Time (at 8 wks) Relative to Control, %
		Initial	After 8 wks	
Dry Diesel Fuel ⁽¹⁾				
Control (Neat Diesel)	—	27	37	—
With SAG TP-325 silicone antifoam	5	8	9	11
With State-of-the-Art AF	10	10	11	14
Wet Diesel Fuel ⁽²⁾				
Control (Neat Diesel)	—	27	33	—
With SAG TP-325 silicone antifoam	5	3	4	12
With State-of-the-Art AF	10	7	12	32

(1) 50 ppm water

(2) 1000 ppm water

Figure 1: Relative Defoam Time of Antifoams as Measured in Dry High-Foaming Neat Diesel Fuel

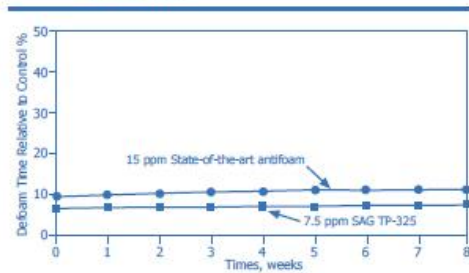


Figure 3: Relative Defoam Time of Antifoams as Measured in Dry Low-Foaming Neat Diesel Fuel

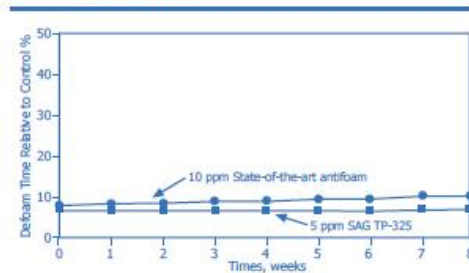


Figure 2: Relative Defoam Time of Antifoams as Measured in Wet High-Foaming Neat Diesel Fuel

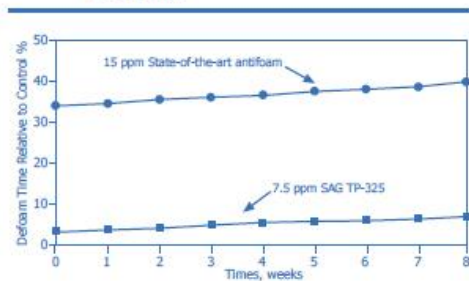
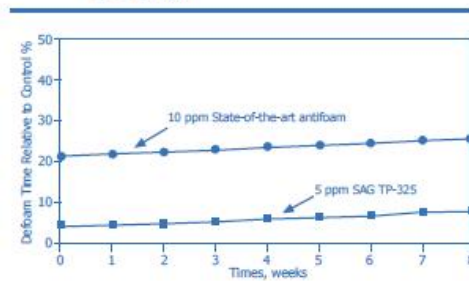


Figure 4: Relative Defoam Time of Antifoams as Measured in Wet Low-Foaming Neat Diesel Fuel



Critical Antifoam Concentration

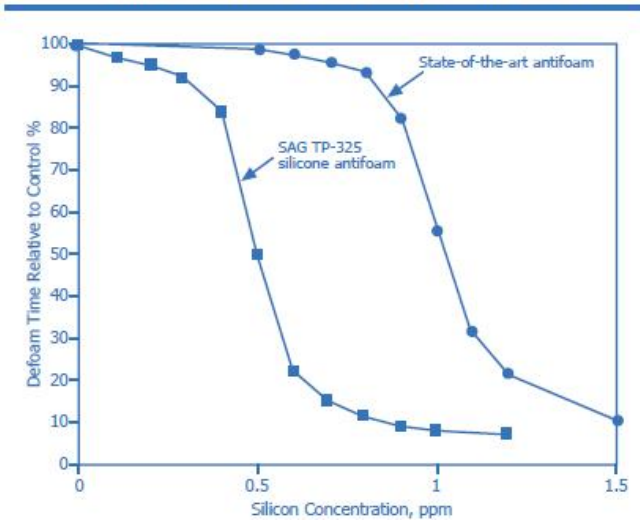
Antifoam performance may be lost below a certain critical concentration; it will depend on the diesel fuel and the DAP.

Figure 5 shows the effect of low silicon concentrations for SAG TP-325 silicone antifoam measured in a typical diesel fuel. The critical concentration corresponds to the sharp change in the curve and occurs at

around 0.4-0.5 ppm silicon for TP-325 silicone antifoam compared to 0.9-1.0 ppm for the typical diesel fuel antifoam.

The results are expressed as a percentage of the defoam time for the control (neat diesel fuel).

Figure 5: Relative Defoam Times of Antifoams vs. Silicon Concentration in a Typical Diesel Fuel



Availability

SAG TP-325 silicone antifoam is available in 200-kg drums. Alternate packaging is available upon request.

Patent Status

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