



**United States**  
513.731.1110

**France**  
+33(0) 3.29.37.88.22

**Japan**  
81.3.3344.3010

**China**  
86.21.6064.9669

## BiCAT ® 8118

### Technical Specifications

Bismuth	15.7 - 16.3%
Nonvolatiles @ 105°C	70% min
Color (Gardner)	6 max.
Specific Gravity @ 25°C	1.09 - 1.15
Viscosity (Brookfield) @25°C	30 Pse

### Product Number

# 1381C

### Description:

Liquid ranging in color from pale yellow to light brown with a musty fatty acid odor

### Application:

Polyurethanes

### Packaging:

450 lb - 55 gallon steel closed head drum

### Chemical Formula:

*Manufactured under ISO 9001 registered quality management systems.*

### Description

Bismuth carboxylates accelerate the reaction between isocyanates and polyols (the urethane reaction) without promotion of any detrimental side-reactions (e.g. water-isocyanate reaction, hydrolysis of esters). As expected, the rate of the urethane catalysis is directly proportional to the concentration of bismuth in the system. We offer a range of bismuth carboxylate catalysts, with varying bismuth concentrations (from 16 wt% – 28 wt%) and varying ligands (2-ethylhexanoic acid, neodecanoic acid). Our bismuth carboxylate catalysts are environmentally benign options to industry standard lead, tin, mercury and tertiary amine catalysts. BiCAT® 8210 is our highest concentration bismuth carboxylate at 28 wt% bismuth. This material has been successfully used in one- and two-component systems for ambient or heat cure systems. Additionally, BiCAT® 8210 has been successfully used in HFO-based polyurethane spray foam systems.

BiCAT® 8108 (or 8118) is a traditional bismuth carboxylate at 20 wt% (16 wt%) bismuth. This material has been successfully used in one- and two-component systems for ambient or heat cure systems. The lower bismuth concentration gives a less viscous material, allow for easier handling and better flow properties.

Bismuth carboxylates are also interesting from a structural vantage point. With long-chain carboxylic acids they are often viscous liquids even at high bismuth concentration (e.g. bismuth 2-ethylhexanoate at 28 wt% bismuth is a liquid with a viscosity of  $\leq 30$  Poise at 25 °C). In 2009, we reported the molecular structure of our viscous bismuth carboxylates as part of a presentation on general metal carboxylate structure at the Spring 2009 Annual Meeting of the American Chemical Society. The structures of bismuth neodecanoate contain clusters, likely  $\text{Bi}_2(\text{OOC10H19})_6$  and/or  $\text{Bi}_4(\text{OOC10H19})_{12}$ , that can reversibly

polymerize when the free carboxylic acid concentration is reduced to a minimum (or, as the bismuth concentration is maximized). Bismuth 2-ethylhexanoate (Bi Oct, bismuth octoate) behaves similarly. Interestingly, the bismuth carboxylates show long-range structure (based on X-ray scattering data) that is reminiscent of liquid crystals.

4900 Beech Street, Norwood OH 45212 • P:513-731-1110 • [www.shepchem.com](http://www.shepchem.com)

The management system governing the manufacture of this product is ISO 9001:2015 and RCMS®:2013 certified.