



# Potassium Formate

Potassium formate ( $\text{CHO}_2\text{K}$ ) is the potassium salt of formic acid. With a molar mass of 84.12 g/mol, this highly water-soluble product is used primarily as a brine in drilling, completion, and workover fluids.

## Applications

- Potassium formate is an environmentally benign alternative to chloride salts. A source of potassium ions, it inhibits shale hydration by ionic exchange.
- Potassium formate is more lubricious than chloride analogues and can be used as the internal brine phase in invert-emulsion systems.

## Usage

Potassium formate solutions are formulated to the required density in accordance with brine tables. The maximum solubility of potassium formate is 75% at ambient temperature. Such a solution has a density of 13.1 lb/gal (1.573 SG). At high concentrations, potassium formate significantly extends polymer thermal stability.

Potassium formate in solid form melts at 334°F (167.5°C) and decomposes before reaching a boiling point. Fluids containing potassium formate should not be retorted in the usual way, at high temperature, to conduct solids analysis. Formate fluids should only be retorted under controlled temperature, with the unit set to a maximum of 248°F (120°C).

Potassium formate solutions solubilize barium sulphate. The degree of solubilization increases with increasing concentration of potassium formate. Soluble barium is toxic; therefore barite should not be used as a weighting agent in potassium formate fluids. Solubilization of barium also occurs in invert-emulsion fluids; consequently, the combination of potassium formate and barite is not recommended.

Potassium formate is deliquescent and must be stored in dry conditions, with packaging completely sealed.

Consult the MSDS, safety posters, and/or product label before use, and use personal protective equipment as advised.

## Advantages

- Provides high-density, solids-free brines
- Is environmentally benign
- Extends polymer thermal stability
- Has a low formation-damage quotient when used as reservoir drill-in fluid

## Typical Physical Properties

Appearance	White powder
Specific gravity	1.91
Purity	97%
Melting point	334°F 167.5°C
Aqueous solubility	32.8 g/100 mL at 32°F (0°C)
	331 g/100 mL at 64°F (18°C)
	657 g/100 mL at 176°F (80°C)
Packaging	50-lb (25-kg) sacks or 1-tonne big bags