

DESCRIPTION

SDA-09 is a universal diverting material that may be used in treating or completion fluids for injection, disposal, oil and gas wells. It functions as a fluid loss additive and diverts at the face of the formation.

SDA-09 is a water clear solution that may be metered into the stream continuously or periodically, or it may be dispersed in the treating solution as the final step of the mixing operation, when batch mixing.

When **SDA-09** is dispersed in the aqueous fluid, a white precipitate forms that functions as a fluid loss additive for diverting. The slow solubility of this precipitate in water, oil and gas enables it to divert effectively and still have good cleanup properties for all applications.

The **SDA-09** precipitate is rapidly soluble in methanol, isopropanol, and aromatic solvents. If rapid cleanup is desired after the diverting operation, then alcohol, an alcohol water blend, or aromatic solvent should be considered as a cleanup fluid.

APPLICATION

FIELD MIXING PROCEDURE

SDA-09 may be metered into the treating or completion fluid continuously or periodically as it is pumped. If batch mixing is preferred, the treating fluid should be prepared and **SDA-09** dispersed in it, as the final step, just before pumping. **SDA-09** should be added slowly as the treating fluid is agitated to disperse the particles of precipitate quickly as they form. Circulation or agitation should be used to maintain the uniform dispersion until the pumping operation has been completed.

CONCENTRATION RECOMMENDATIONS

The concentration of **SDA-09** to accomplish effective diverting is influenced by solubility. When the **SDA-09** is added to the treating solution, fine particles of precipitate form. Part of the solids will dissolve during pumping down hole and the amount dissolved will depend on temperature and treating fluid. The volumes of **SDA-09** recommended for various treating fluids and temperature are listed in Figure 1.

An examination of Table 1 under "Additional Data", shows that about 40 to 50 gallons of **SDA-09**/1000 gallons of 15% HCl should be adequate to divert at 1000 psi differential pressure, and 76° F. The concentrations of **SDA-09** listed in Figure 1 include an excess of 45 gallons over that which will be dissolved by the indicated solutions at the indicated temperature.

The 40 to 50 gallon excess of **SDA-09** above that dissolved at the treating temperature, appears adequate in laboratory tests. However, field operations have been conducted for special applications and conditions where a concentration equivalent to 500 gallons of **SDA-09** added to 1000 gallons of 15% HCl was used.

PUMPING PROCEDURE

SDA-09 may be used as a diverting agent in sandstone or limestone acidising. The preferred sandstone acidising procedure consists of 3 stages of treating fluid: The HCl preflush displaces formation water and dissolves CaCO₃ that may be present. The HCl displacement of formation water helps eliminate the mixing of spent HF Acid with water, containing NaCl or other metallic salts, which could result in the formation of insoluble metallic fluorosilicates. The dissolving of CaCO₃ present in the formation helps eliminate the reaction of HF Acid with calcium ions which would result in the formation of CaF₂ precipitate. If CaCO₃ is not present, a preflush of ammonium chloride solution can be considered. **SDA-09** may be used in the acid or ammonium chloride preflush to uniformly distribute the preflush through the zone. If this is done, the preflush should be followed by alcohol to dissolve the diverter.

The second stage of treating fluid, HF Acid, should contain diverter so that it will be uniformly distributed through the zone. The second stage flows through the matrix permeability, dissolving clays, and a small amount of quartz to increase formation permeability for increased production. The clays dissolved may be a natural component of the formation or clays that penetrated the formation adjacent to the well bore during drilling operations.

The third stage consists of an overflush. The overflush may be ammonium chloride solution, dilute HCl, oil containing mutual solvent, or alcohol. The third stage prevents the mixing of salt water displacing fluid with HF Acid and maintains the formation in a water wet condition. Ordinarily the treating fluid, HF Acid, that contains **SDA-09** would be overflushed with ammonium chloride solution, dilute HCl, or oil containing mutual solvent, but occasionally an overflush with alcohol may be considered for rapid cleaning. Oil is not normally used in gas wells or water injection wells.

DESCRIPTION OF APPLICATION

SDA-09 is dispersed in treating or well completion fluids for the primary purpose of controlling the loss of fluid into the matrix permeability of the formation. Diverting may be achieved in a perforation, at the face of the wellbore in an open hole completion, on the formation behind a sand pack or through slots in a liner.

USE PRECAUTIONS

If solutions (alcohol, acid, spent acid, etc.) are saturated with **SDA-09** at elevated temperatures, fine needle shaped crystals will form a voluminous precipitate on cooling. This precipitate is readily soluble in alcohol, alcohol-water blends, or aromatic solvent. It is slowly soluble in water, oil and gas.

Mutual solvent should not be used in the preflush or HF acid stages with **SDA-09**. Mutual solvent increases the solubility of **SDA-09** precipitate and will prevent effective diverting. It may be used in the after flush, however. If **SDA-09** is used in wells completed with gravel packs at elevated temperatures the diversion will be on the pack instead of on the formation, unless the pack is coarser than 20-40 Ottawa sand. Particles precipitated from **SDA-09** coalesce at temperatures above 120° F and will not pass through a bed of 20-40 Ottawa sand.

USES

SDA-09 solids are soluble in water, oil and gas and may be used to divert in water injection, disposal, oil and gas wells. It is applicable at temperatures up to 252°F, the precipitate's melting point, if the well is not completed with a gravel pack or the pack is coarser than 20-40 Ottawa sand. **SDA-09** solids coalesce at elevated temperatures and will not pass a 20-40 Ottawa sand pack but will divert in slots or perforations or on the gravel pack itself.

PHYSICAL PROPERTIES

Appearance	Cloudy suspension
Odour	Alcohol
Boiling Point/Boiling Range(°C)	64.7
Melting Point/Melting Range(°C)	-97.8
Flash Point (°C)/Method Used	9-10
Vapour Pressure	12.9kPa @20°C
Specific Gravity	0.875
Solubility in water	Miscible

PACKAGING

Supplied in 200L drums or 1000L IBCs

ADDITIONAL INFORMATION

None