



Non-damaging Killing of Wells

It is impossible to perform high quality repair and maintenance works in wells without killing of the wells. Multiple well killing with aqueous fluid affects negatively the reservoir properties of formation pay zone. To preserve reservoir properties some modifying additives are added to the brines, which provide brine compatibility with formation fluids, reduce oil-water interfacial tension and change rock wettability, reduce the residual water saturation of reservoir and increase relative oil permeability ratio.

Well killing, even within the same area, requires an individual approach to the selection of killing fluid parameters. The use of specialized solid-free killing fluids can reduce significantly the period of bringing of wells to stable production after repair and maintenance operations, as well as increase significantly oil flow rates.

In some cases, compatibility of killing fluids and formation fluids can only be achieved with the application of calcium-free killing fluids.



Chemicals and technologies for non-damaging killing of wells:

1. Killing of the wells with abnormally high formation pressure:
 - ✓ High density brines of **TZhG** brand with the densities ranging from 1.3 g/cm³ to 2.1 g/cm³;
 - ✓ Dry compositions of **TZhS** brand for preparing high density brines for killing of wells.
2. Killing of the wells with abnormally low formation pressure:
 - ✓ Water-based ultralight killing fluids of **ULZhG** brand with the densities ranging from 0.7 g/cm³ to 0.9 g/cm³;
 - ✓ Hydrocarbon emulsions based on emulsifiers **EKS-EM** and **EMITRIT**®.
3. Modifying of well killing brines and process fluids, displacement fluids, flushing or circulating fluids with hydrophobic surfactant chemical **GF-1**.
4. Fluid loss control at well killing operations at maintenance and repair works in the wells with Abnormally Low Formation Pressure (ALFP) with high formation permeability with the help of temporary blocking pack **PLASTIROX**®.
5. Reducing of H₂S and mercaptans content in killing fluids and in flushing or circulating fluids when performing the works in the wells complicated with the presence of H₂S and mercaptans with the help of H₂S scavengers of **PS** brand.
6. Preventing of scale precipitation with the help of scale inhibitors of **INIPOL**® 32 K and **SALTONIX** brands.



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Chemical	Description	Purpose of Application	Density	Comments	
TZhG 1,3 1,6 1,8 2,0	Solid-free calcium-based or calcium-free high density brines	Killing of production and injection wells for maintenance and repair works. Drilling of wells	from 1.3 g/cm ³ to 2.2 g/cm ³	Ready-to-use brine	
TZhS 1,3 1,4 1,6 1,8 2,0	Dry compositions for preparing calcium-based or calcium-free high density brines	Killing of production and injection wells for maintenance and repair works. Drilling of wells	from 1.1 g/cm ³ to 2.2 g/cm ³	Dry composition based on mineral salts completely soluble in water	
ULZhG	Hydrocarbon-free water-based ultralight killing fluids containing viscoelastic surfactants	Killing of production wells with abnormally low pressure for maintenance and repair works at the temperatures under 75°C	from 0.7 g/cm ³ to 0.9 g/cm ³	The composition is supplied in the form of components to be mixed at site	
EXTELIGHT	Inert to rock extender for the ultralight killing fluids	Inert to rock extender, which allows to reduce the density of ultralight killing fluids, blocking packs and drilling muds	bulk density 0.4 g/cm ³	Particulate material	
GF-1 grades M, K, V	Hydrophobic surfactant for the modifying of killing brines	Killing of wells. Preparing of process fluids for work-over operations	from 1.0 g/cm ³ to 1.6 g/cm ³	Concentrated product. Recommended consumption 0.2-1.0 % by weight	
EKS-EM	Emulsifier for hydrocarbon emulsions	Killing of wells with abnormally low formation pressure and high fluid loss at the temperatures up to 70°C	from 0.9 g/cm ³ to 1.2 g/cm ³	Concentrated product. Recommended consumption 2-4 % by weight	
EMITRIT®	Emulsifier for hydrocarbon emulsions	Killing of wells with abnormally low formation pressure and high fluid loss at the temperatures over 100°C	from 0.9 g/cm ³ to 1.2 g/cm ³	Concentrated product. Recommended consumption 2-4 % by weight	
PLASTIROX®	Temporary blocking pack for killing of the wells, which prevents well-killing fluid loss	Killing of high permeability wells with ALFP in fractured reservoirs	from 1.06 g/cm ³ to 1.40 g/cm ³	Dry composition. Supplied in the form of components	
PS-1 type 1 type 2	Free formaldehyde free H ₂ S and mercaptans scavengers	H ₂ S removal in water-based media	—	Liquid. Concentrates.	
PS-2	Formaldehyde free H ₂ S and mercaptans scavenger			Liquid. Water-alcohol solution.	
PS-3	Formaldehyde free H ₂ S and mercaptans scavenger			Liquid	
PS-4 type 1 type 2	Formaldehyde-based H ₂ S and mercaptans scavenger			Liquid	
PS-4 type 2	Free formaldehyde free H ₂ S and mercaptans scavengers			Liquid. Concentrates.	
INIPOL® AD 32 K	Scale inhibitor	Protection of oilfield equipment from affecting of calcium, barium and strontium salts	—	Liquid. Recommended consumption is 5-20 g/t	
SALTONIX	Scale inhibitor	Protection of oilfield equipment from affecting of Ca and Fe salts	—	Liquid. Recommended consumption is 5-20 g/t	

To select the optimal consumption of chemicals and application technologies please contact POLYEX specialists.

Scale inhibitor INIPOL® AD 32 K is manufactured according to the technology and from the materials of ARKEMA FRANCE (France).



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