



PRA©

Petroleum Remediation Additive

PRA© Petroleum Remediation Additive is a non-flammable and non-toxic petroleum/paraffin-removal treatment for use in all phases of the oil industry. PRA© can be applied at any point in the oil production process where paraffin build-up occurs, particularly down-hole, flow line, tank bottom, transport vessel, pipeline, and tank farm facility operations.

PRA© is applied to paraffin build-up by using the chemical with adequate amounts of good crude oil and agitation. PRA© breaks down the paraffin, causing the oil in the paraffin to go into solution and stay in solution with the good crude until refining may take place. Basic substances and solids will be suspended with agitation and can be easily pumped off. This process may also be applied to saltwater disposal systems. Not only does our process work effectively, it is also one of the most cost-effective treatments available to industry.

PRA© is at least three (3) to five (5) times more efficient, on a volume basis, than any other known paraffin dispersant. Once dispersed and dissolved, the paraffin remains dissolved (when PRA© is properly applied). PRA© has been proven to work where solvents and products have not or could not. Heavy crude oil viscosity losses up to 90% have been observed. When applied to your producing wells, PRA© disperses paraffin deposits as well as scale-like

deposits which occur in the well bore, perforations, and pump during down hole operations.

In addition to eliminating paraffin build-up around the tubing and pumping components, existing and future deposits will also be eliminated and prevented from accumulating in your flow lines and separators. PRA© also keeps the heater-treater operating more effectively by reducing internal build-up.

By lowering the oil viscosity, there is an increase in the amount of well flow. This provides improved above-ground handling as it lowers costs due to less heating of oil to make it flow. By keeping the paraffin build-up low, there is a reduction in pressure increases normally resulting from the plugging of formations. Improved overall well production is obtained by maintaining an improved degree of internal well cleanliness. By adding PRA© to down hole operations, one can increase the effectiveness of scale and corrosion inhibitors, plus keep waxy deposits out of water-handling facilities.

Subsea/Offshore Wells

Use of organic solvents in sub-sea flow lines especially in deep water has never been efficient. The generation of paraffin crystals are caused by the initial temperature of crystals with the lightest temperatures at which the solid phase in the oil is first initiated. When you have oil submitted to a previous thermal treatment at a controlled cooling rate you are going to have paraffin problems. The best way to prevent paraffin problems is by injecting PRA© on a continuous daily basis. This will avoid the use of expensive mechanical methods such as pigs, scrapers, knives, hot oil, and the use of organic solvents.

Paraffin Applications

Removing paraffin deposits by circulating cold organic chemicals sometimes means having to replace costly flowlines to return acceptable

production. This type of process can be deadly to various types of sub-sea flexible flowlines. The following methods are proven applications for PRA© against Paraffin:

- ◆ **PRA© should be added to storage tanks at the rate of 2-5% of the sludge buildup.**
- ◆ **PRA© should be applied to producing well at the rate of 2-5 gallons/100' of well depth.**
- ◆ **PRA© should be injected into pipelines at 100ppm.**
- ◆ **Using heat and blending PRA© with brine water will always give you positive results.**
- ◆ **Using heat and blending PRA© with brine water, crude oil, and the best agitation possible will always enhance the chemical reaction.**
- ◆ **Using heat and blending PRA© with the mother crude oil & circulating through system is highly effective.**

When PRA© is added to your pipeline operations, it enhances the overall effectiveness of the corrosion inhibitors and reduces the scheduled number of line scraping operations over a given period of time. This results in reduced pipeline repairs as a result of build-up problems and increase the flow of oil, while keeping the pipeline from accumulating additional and potentially harmful paraffin deposits in the future.

Reclamation Operations

PRA© can be used as a cost-effective benefit from waste pits to tanker bottoms to storage facilities at tank farms. PRA© can be effectively used to recover any appreciable paraffin or heavy ends contained in the sludge (BS&W), which can be recovered and sold, either for profit or to help offset the costs of cleaning operations. The recovered EXTRA oil may be sufficient enough to pay for cleaning costs, thereby eliminating the cost factor from future cleaning operations budgeting.