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Health & Safety

Gold Crew
Hydrocarbon Mitigation Chemistries

Environmental



Gold Crew Dispersants

Gold Crew is a highly concentrated dispersant that is diluted at least 20 times at application. Gold Crew may be premixed at this dilution and be ready for use or can be educted through fire equipment at application. This highly concentrated dispersant maximizes space on the oil platforms or workboats while allowing maximum product available to handle a wide variety of spills.



Gold Crew OSD ... a little goes a long way

Competitively priced ... its not what you pay ... it's what you get...

Most solvent based dispersants are applied full strength and are not to be diluted.

Gold Crew OSD MUST BE DILUTED. Gold Crew is diluted 1 part Gold Crew to 20 parts water and up to 60 parts water depending on the type of hydrocarbon to be dispersed.

Gold Crew OSD reduces dispersant costs and maximizes dispersant application.

- 100 drums of Gold Crew concentrate makes at least **2000** drums of usable dispersant
- 100 drums of solvent based dispersant makes **100** drums of usable dispersant.

Gold Crew OSD in The Lab

- Gold Crew was tested at the Warren Springs Laboratory and was found to achieve a 90% effectiveness rating at the application rate of 2.5 to 1, oil to diluted dispersant ratio.

The dispersant was tested at a 10% solution. Under laboratory test parameters This equates to the following:

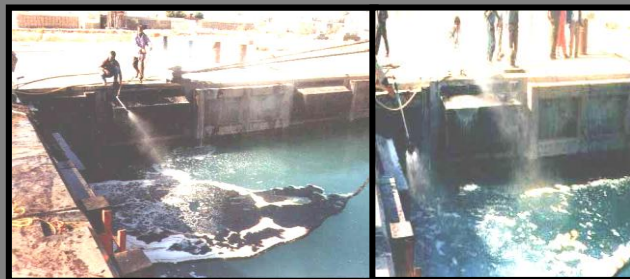
1000 drums of diluted dispersant treats 2500 drums spilled oil*;
treating 137,500 gallons, 519,750 liters or 3273 barrels of crude oil.

For lighter end petrol, this application ration can be much greater.

Greater dilution rates are achieved when applying OSD through standard field equipment thus increasing its effectiveness.

Gold Crew OSD in the Field

Funiwa Oil Blowout	200,000 bbls or 8.5 million gallons	8,800 gallons of GCOSD
Santa Barbara Spill	77,000 bbls or 3.25 million gallons	5,500 gallons of GCOSD



Gold Crew has been delivering results since 1965

Safe to handle ●● Stores easily ●● Use through fire hoses or ships monitors or hand pump sprayers ●● Effective in all types of seas ●● Prevents and suppresses fire ●● Enhances biodegradability of hydrocarbon ●● Does not sink oil ●●

Gold Crew's Vapor Suppression Advantage:

All Gold Crew Products suppresses VOC release and can be used during a fire, potential of fire, or any application where vapor suppression can increase public & responder safety.

Gold Crew Vapor Lock injected into specific points during a platform shut down will greatly assist in eliminating LEL vapors. This process will help enable the "**Shut-In**" to maintain the scheduled time allotment to complete repairs and maintenance. In many cases, platforms have reported ahead of plan operations with completions 3 to 4 days ahead of schedule. This is attributed to not having to stop work to re-inert the system.



Typical Injections Points for Gold Crew on Oil Platforms

Coolers

Drain and depressurize then inject a 5 % solution of Gold Crew

Test Separators

Flush with caustic and inject 300 gallons of a 5% solution and recirculate, drain and reinject.

Remotes Gas Compressors

Dump Caustic and fill with 5% Gold Crew, circulate and dump. Refill with 5% Gold Crew to clean, drain and inspect.

H.P. Separator; I.P. Separator; L.P. Separator

Inject 15 gallons of Gold Crew @ 5% into vessel and continue filling with water flush, drain and refill vessel and add 15 gallons of Gold Crew Concentrate

Skimmer

Flush and close valves, fill with 30 gallons of Gold Crew Concentrate and hold in tank

Treater

Flush, purge, and refill with 15 gallons of Gold Crew.

HP-Flare Scrubber

Rig up firehose to educt a 5% solution of Gold Crew into the vessel and continue to inject solution until water flushes out the top of the vessel. Shut valve and continue to inject Gold Crew solution until water flushes out of both the HP flare tips.

LP-Flare Scrubber

Disconnect 3/4-inch blind flange on the Test Separator and continue pumping water with a 5% solution of Gold Crew until it flows out the 3/4-inch blind flange line on the Test Separator.

LP Flare Header from the Separators to the LP Scrubber

Pump water and a 5% Gold Crew solution into the vessel and to the pile. Close SDV to Pile and continue pumping through the 10" Flare line and check valve into the LP Header. Crack open flange on Skimmer Gas to Flare line until water comes out then close. Crack open Amine to LP Flare line until water comes out than close again. Open flange to Surge Tank until water comes out. Then follow purging directions.

Amine System

Add 1000 gallons of fresh water, 20 gallons of Gold Crew, and circulate for two hours, purge w/ nitrogen until acceptable LEL is reached and drain.

These are examples of injection points as utilized during a shut-in workover operation. This information is NOT to be used without proper and complete written protocols that take into account every aspect of the shutdown operation.

Gold Crew for

Vapor Suppression ●● Interfering Gas Lines & Tanks ●● Eliminating LEL during Shut Ins & Turn-arounds●●

WASHING OF "OIL BASE" DRILLING CUTTINGS

Cuttings Flow and Treatment

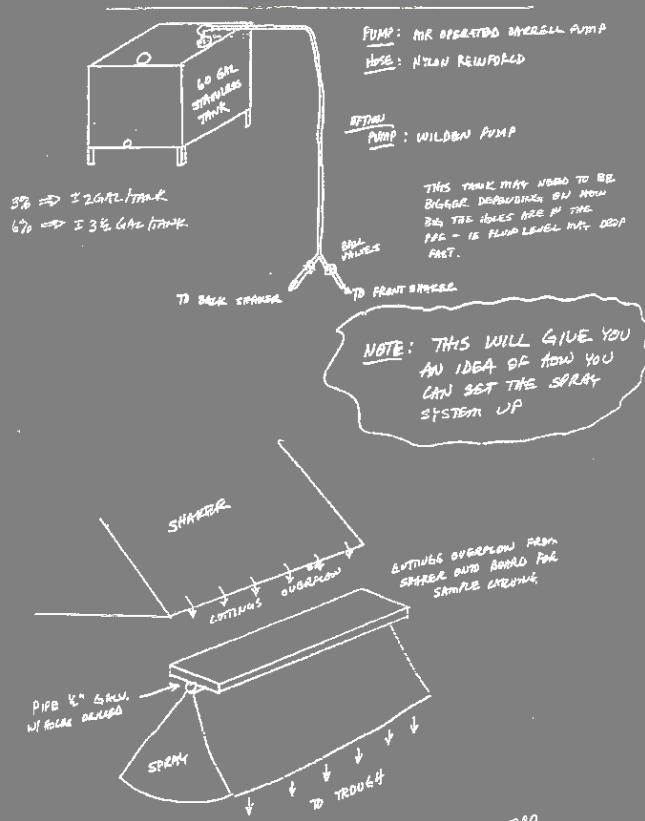
The following is a basic or "usual" flow pattern of any type of drill cuttings, regardless of their chemical make-up or weights. (Drill cuttings are weighed accordingly to the bottom hole pressure of the hole section which the bit is exposed.

The cuttings are circulated up the annulus. (The annulus being the open space between the well bore and the drill pipe.) From here they travel across to the "bell" nipple and proceed to the Shakers. From the shakers there are 2 paths which some or all of the cuttings will flow. The paths are:

1. Disposal ditch
2. solid control units

For this purpose, the disposal ditch is the target for the product. ANY materials which enters this system, is headed for over-board discharge to the sea or disposal barge. These cuttings will never be re-introduced to the well bore.

The shakers are very large devices where-by all ALL spent annulus materials is spread across them, this removes the "heavy and oversized" bits and pieces recovered from the well bore. Metal cuttings are also separated from the mud at this point.



To help meet the regulatory requirements associated with discharging the cuttings to the sea (if applicable), 8 - 10, stainless steel nozzles are arranged to cover the spent materials traveling path, prior to over-board discharge. The nozzles are placed across each shaker screen, the ditch and once again in the actual disposal chute to the sea floor.

The Gold Crew SW's application points are at the shakers; here is the largest concentration of nozzles (Depends on width of shaker). the ditch (1 nozzle placed in the middle and 1 at the end, prior to discharge line) and in the dump chute approximately 2' and 12' apart.

Clients should always conduct testing in their respective markets to verify the technology. Run both visual and by laboratories protocols to determine the value the process has on the environment, aquatic life and assure that regulatory requirements are attained.

When properly applied, the oil sheen which is normally present as a result of the improperly treated cuttings being discharged is eliminated.

Gold Crew Products address many problems in drilling operations.

Safe ●● Biodegradable ●● Unlimited Shelf Life (unopened) ●● Water Based ●● Environmentally Sound

Gold Crew[®]

Over 35
Years of
Technology

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Gold Crew was the first dispersant listed on the EPA's NCP Product Schedule in 1977 and was the first water based dispersant developed for use in shallow water environments. Gold Crew dispersant works on contact and for over 35 years has been used to deal with hydrocarbon spills around the world.

Industrial Services

Vapor Suppression

Gold Crew's surfactants were designed to micro-emulsify organic particles, surrounding them in the water based chemistry. This organic-shell all but eliminates the volatile compound (odor or vapor) from gassing-off into the atmosphere. This suppression can eliminate the potential of fuel fires and the explosion potential of VOC release during tank or confined space entry. Gold Crew is equally effective on many types of off gases and odors like H₂S and mercaptans. Gold Crew is a proven, long term suppressant that does not dissipate or lose it's effectiveness in adverse climates, can be applied through pressure washers or steam jennies and is effective on a wide range of hydrocarbons.

Paraffin Control

Used in conjunction with the oil and water, Gold Crew Paraffin solubilizes the wax back into the oil. Whether removing existing wax build up from the pump or tubulars or keeping it in solution with the oil, preventing build up, Gold Crew Paraffin can stabilize production, eliminate costly stripping operations, reduce operating expenses and even increase production by eliminating paraffinic blockages in the near well bore.

Tank, Pipeline and Cleaning Applications

Gold Crew is a multi-faceted asset in tank cleaning and/or degassing applications. This water-based chemistry dramatically increases the efficiency in tank degassing procedures because Gold Crew works in the vapor phase. When applied into the tank, Gold Crew not only accelerates the vapor reduction but when used in conjunction with the power washing applications, it eliminates the resurgence of vapors normally emitted from the tank or pipeline sidewalls. Gold Crew cleans tank or pipeline walls down to the metal. This feature will dramatically decrease the downtime involved with normal tank degassing and cleaning operations. The surfactant blend used in Gold Crew solubilizes sludges, rapidly allowing the normally un-pumpable sludge to become readily pumpable.

For cleaning, when heated to 160 degrees F, Gold Crew is as effective as caustic without the hazards of the high pH. Gold Crew is compatible with most biological treatment ponds and will not upset wastewater treatment systems.

Technical Data

Flash Point	Non Flash	ASTM	D1310-72
Pour Point	22°F	ASTM	D97-66
Viscosity at 100°F	126FUS	ASTM	D-445-74
Viscosity at 32°F	35cSt		
Specific Gravity at 60°F	1.0382	ASTM	D-1298-67
pH (concentrate)	9.8	ASTM	D-1293-65
	8.5 diluted 40 to 1 with sea water		
Ionic Activity	nonionic	Weatherburn Test - Federal Register Vol. 40, No. 28; 2003.3-4.14	
Cloud Point	-2°C		
Surface Tension	6% 27.7 dynes	ASTM	D 133
	0.06% 27.8 dynes		
	0.03% 28.2 dynes		

Operating Procedure for Washing of Oil Based Mud Tanks

The intent for this procedure is to allow any anchor handling, tow or supply which has the capability to care quantities of oil based mud, to clean the tanks at sea. The following conditions must be met at all times.

1. The tanks to be washed will be pumped out of all material to ensure that only the base sediment is left.
2. As the refilling of the tanks is being conducted, add 6% chemical and allow the mix with the water.
3. Once the tanks are full of water and Gold Crew solution, the tank should be agitated for 1 hour.
4. If possible, circulate the first tank into the next tank to be cleaned. It may require adding some additional Gold Crew to maintain effective cleaning level. The objective is to minimize waste water by continually moving wash water to the next tank to be cleaned.
5. After the tank(s) have been properly agitated, any residual oils should be emulsified and encapsulated adequately for deep ocean disposal if allowed. If not, the material can be transported to a waste water treatment facility or a biologically active treatment pond.
6. A final rinse of the tanks with clean sea water will rinse out any residual cleaning material.



ECS makes this protocol available to be used as a guideline or reference to compare and determine the applicability of Gold Crew and the cost factors involved with that of other products or methods. Nothing included herein is to be taken as a license to use Gold Crew without the proper permits, approvals, etc. of the appropriate regulatory agencies, nor is the protocol provided as instructions for any specific application of Gold Crew.

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**GOLD CREW SHOULD ONLY BE USED IN COMPLIANCE WITH
ALL STATE AND LOCAL RULES AND REGULATIONS**

