



TUBING CLEANING AND PROTECTION

Thermo-Reagent Capsules



YOUR ULTIMATE SOLUTION

THERMO-CHEMICAL CAUSTIC CAPSULES FOR TUBING CLEANING (TBC)

- Modern product based on an old formula developed 50 years ago by Soviet scientists
- Alkali capsules produced by special method and know-how
- Continuous quality control for every capsule
- Proven efficiency
- Used for tubing cleaning and protection against corrosion
- Suitable for all type of tubing
- Quick execution
- 100% Guaranteed effect



ThermalBeast thermo-reagent capsules (RC) - cylinder elements 20-50 mm in diameter produced from alkaline, alkaline-earth metals and other components, sealed in aluminum foil

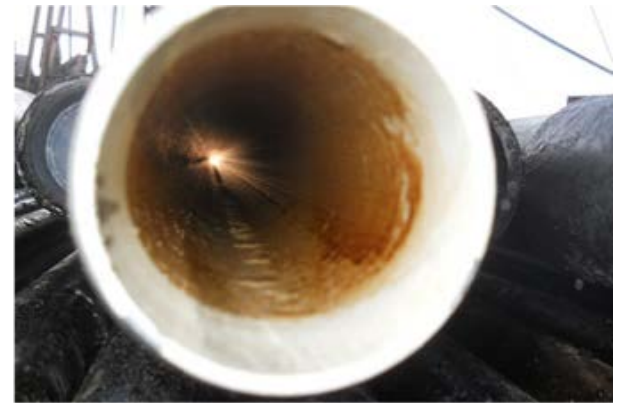
TWO IMPRESSIVE EFFECTS OF THERMALBEAST RC

1) Tubing cleaning:

Intensive removal of the hard wall adherent ASPHALTENE deposits (the centres of the paraffin plug formations)

2) Tubing coating:

Tubing surface coating with ALUMINIUM OXIDE film layer, leading to a significant decrease of pipe corrosion and lowering deposits forming on the tubing surface. As a result tubing coating reduces oxidation of tubing surface, reduces tubing surface roughness, increases flow, the production rate and overhaul life of tubing



THE KNOW-HOW



- ✓ Process based on the principles of self-regulatory reaction and capsule self-descending fall under the own weight
- ✓ The reaction rate and the amount of released heat depends on the interaction of active mass with medium and the sheath dissolution rate
 - Reaction zone temperature between 95-98 degrees Celsius and could be increased up to 120 degrees by adding HCL acid with a higher concentration (up to 24%)
- ✓ Operation intervals: from the wellhead down through plugged interval
- ✓ Short operational downtime:
 - The standard treatment time approx. 5-7 hours
 - Fully blocked wells - approx. 20-30 hours
- ✓ Service can be done with limited quantity or even without HCL acid
 - The temperature and the speed of reaction will be reduced in this case
- ✓ Long-time effect between next service: 3-20 weeks (depends on well conditions)
- ✓ Chemicals consumption:
 - During preventive overhaul: 5-15 kg
 - Fully blocked wells: 30-40 kg

ULTIMATE SOLUTION FOR TUBING CLEANING



- ✓ Applicable for a wide range of wells
- ✓ Offshore wells
- ✓ Perfect solution for a reanimation and taking into operations a fully blocked wells

- ✓ A real Sustainable Technology:
 - Process is completely insulated from the environment
 - No residual solid products are formed
 - The hard reagents and treated deposits are fully dissolved into the produced fluids
 - No harm or damages in tubing or reservoir

- ✓ Capsules designed and produced based on the general well date:
 - Oil and water composition
 - Well design
 - Tubing ID
 - Wellhead design, lubricator, Ring BX

- ✓ Important! Capsules produce thermochemical effect even with the water contact in case HCL acid can not be used for certain reasons

OPERATIONS

- Choose operational tubing interval (targeted depth)
- Insert pack of capsules into the tubing by one via a standard lubricator manually or mechanically (free drop of capsules starting from “0” depth)
- Fill HCL acid by small dozes (approx. 1 m3 per well of pre-agreed acid concentration)
- Interaction of capsule composition with certain components in tubing ignite a thermochemical reaction
- Thermochemical reaction results in a large amount of heat, hot liquid and gas chemical components
- Chemical reagents ejaculate from a capsule and wash asphalt, scale, resin and paraffin deposits off from tubing walls as well as the centers of their crystallization
- The chemicals react gradually and fall down under their own weight
- Flash washed out liquid mixture into the operating line
- Aluminum compounds formed during the reaction interact with the iron oxide of tubing and coat tubing surface with aluminum oxide
- After the completion of the tubing cleaning (the drift mandrel falls down freely) switch a well to operation on the flowline.



Example: The Lyantor field, Russia



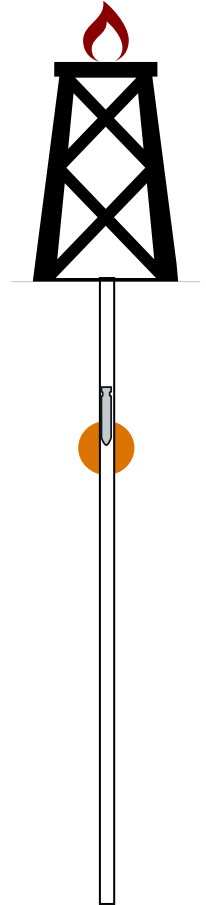
Pad/Well	Depth of plug, m	Original Flow Rate, bbl/d	Flow rate after TBC treatment, bbl/d	Amount of TBC reagent used, kg	Interval between treatments, Before TBC/after TBC treatment, days	Efficiency coefficient, %
365/2349	669	239	428	5,5	14/26	185,7
526/4516	-	0 (blocked)	377	27,2	0/28	-
383/2776	-	0 (blocked)	379	34,3	0/24	-
540/3912	560	226	345	4,8	16/31	193,7
443/5582	900	195	213	6,8	19/36	189,4
443/5578	900	151	289	6,2	17/32	188,2
427/3836	900	214	289	6,9	15/26	173,3
439/4138	900	151	233	7,2	16/30	187,5
604/5338	900	214	294	6,9	17/29	170,5
380/2752	600	208	340	4,6	16/30	187,5
372/2174	100	201	359	2,2	18/34	188,8
458/4372	220	176	270	2,9	17/31	182,3
464/4249	-	0 (blocked)	327	36,5	0/26	-
682/6366	-	0 (blocked)	239	34,8	0/23	-



Technology Advantages



- Technology is suitable for all type of reservoir
- Technology works in 100% cases
- Effect lasts for 9-12 months
- No special equipment required
- Non-toxic
- No effect on oil quality





THANK YOU!

