

Anti-scale anti-wax anti-corrosion device

1. Corrosion Prevention&Removal Systems(CPRS SYSTEMS):

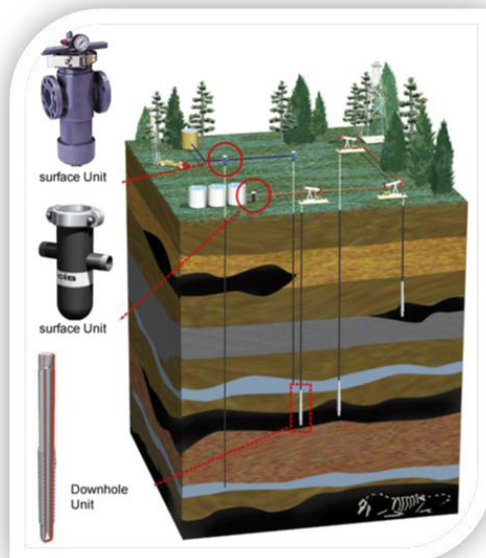


CPRS, Corrosion Prevention and Removal Systems, is the state of art solution to Paraffin, Asphaltenes, Scale, and Corrosion

The systems design, material composition and metallurgical processing have been patented and proven in the USA, Canada, Mexico , China and other countries in

preventing and removing Corrosion, Scale, Paraffin, Asphaltenes

2.Types and Functions



COMPLETE SERIES

Downhole Units

Surface Units

ONE TOOL, MULTI-FUNCTIONS

Paraffin, Asphaltenes, scale and corrosion Prevention

Paraffin, Asphaltene, scale and corrosion removal

CO₂, H₂S separation from the liquid

Bacteria, Algae removal and water quality improvement

3.CPRS Downhole Units



Bar Style : To be used for 2-3/8", 2-7/8", 3-1/2" production tubing, a 1.66" bar, with a flowrate of 90GPM

Disk Style : To be used for 2-3/8", 2-7/8", 3-1/2", a string of 10 discs.

Full flowrate processing of the wellbore liquid
Housed with a short standard API production tubing joint.

4.CPRS Surface Units



Canister Style



Inline Style with Fixed Diameter



Inline Style with Variable Diameter

Size Range: 1" to 24"

Standard Pressure ratings: 2.5 MPa-25 MPa,

higher pressure units can be built per the customer

requestsHousing Material: Carbon Steel,

Stainless Steel, depending on the applications and

customer requestsThe units will come with companion

flanges, and boltsTo be used for both oilfield production

wells and water injection wells

5. How CPRS works?

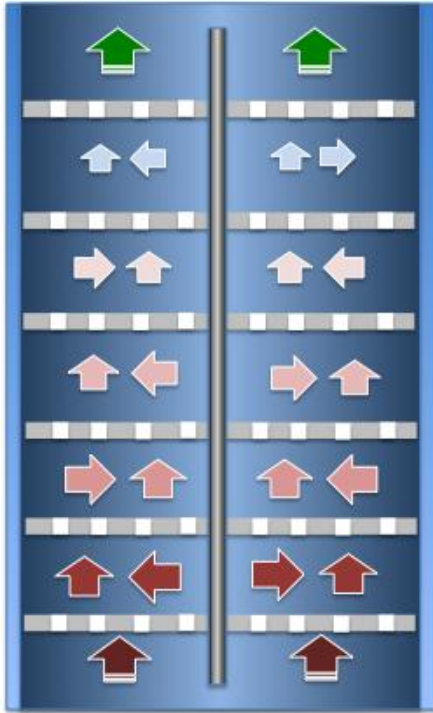
The CPRS is comprised of nine dissimilar metals such as Copper, Zinc and Nickel, etc., which forms a special catalyst when placed in contact with fluids

The metals act as a special catalyst to enable a change in the electrostatic potential of the fluids, inhibiting the binding forces between particles in the fluids

Suspending solids and inhibiting the formation of scales, paraffin, Asphaltenes and corrosion.

The metals are non-sacrificing during the reaction process.

6. CPRS, Paraffin and Asphaltene



During the well production, crude oil, together with paraffin, asphaltenes, and resins, etc. will pass through the CPRS disc holes by pressure, causing streams or jets of flow to bombard at the disc surfaces

CPRS energy will keep the paraffin, asphaltenes, resins to maintain the original micelle stable condition or even more stable

The whole treating process not only prevents the paraffin and asphaltene buildup, but also breaks up the long chain hydrocarbon molecules, making the oil “slicker”.

Field installations proved

Significant pour point reduction for cold climate production

Reduced viscosity of heavy oil and Increased fluid mobility

Improved well pressure without the use of heat, steam, drag reducers or chemicals

7. Oilfield Scale



A mineral deposit deposited in the tubing string, the gravel pack, the perforations or the formation.

Typical oilfield scales include calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, iron sulfide, iron oxides, iron carbonate, etc.

Scale deposition occurs when water is disturbed by pressure and temperature changes, dissolved gases or incompatibility between

mixing waters.

Scale deposits are the most common and most troublesome damage problems in the oil field and can occur in both production and injection wells. Scale creates a significant restriction, or even a plug, in the production tubing.

All waters used in well operations can be potential sources of scale, including water used in waterflood operations and filtrate from completion, workover or treating fluids.

8. Why CPRS Should Be Used?

Prevention and removal of the buildup of paraffin, Scale and Corrosion

Non-magnetic, non-electrical, and no chemicals required, environmental friendly

Good for high pressure and temperature operations and not affected by magnetic fields and other factors

Reduced downtime and replacement cost

Reduced chemicals cost

Reduced hot oil treatments

Reduced bottom sludge setting in tank batteries

Increased equipment efficiency and life

Easy installation and almost maintenance free

9. Where Can CPRS Be Used in the Oilfield?

DOWNHOLE APPLICATIONS

Flowing wells

Pumping wells

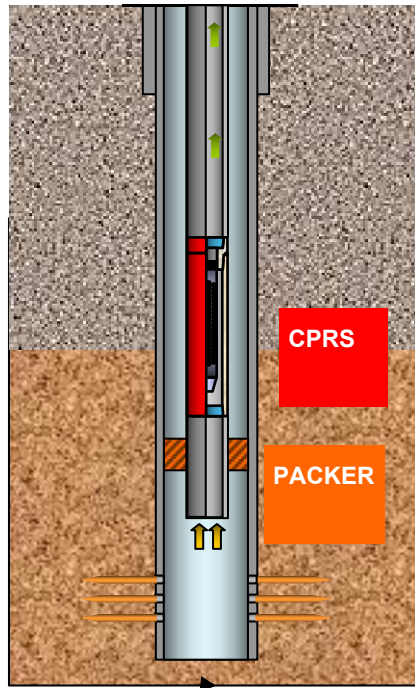
Gas lifting wells

Water injection wells

SURFACE APPLICATIONS

Oil and natural gas production facilities
Crude oil and natural gas transportation lines
Water injection flow lines
Produced water treatment systems
Crude oil storage tanks

10.Applications @ Flowing Wells



To be installed at the bottom of the production string @ designed well depth

The tubing joint style unit installation is the same way as making a single joint connection

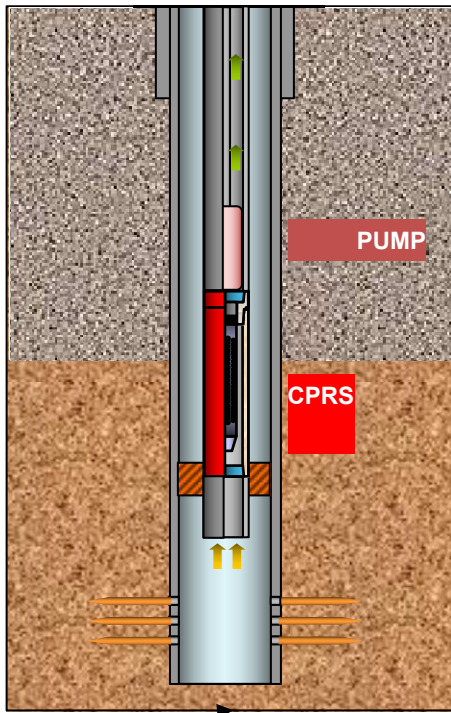
The bar style unit can be run in and out of the wellbore with wireline unit and to be positioned at the seating nipple inside the production string

The crude oil will enter the CPRS unit first before going up to the surface

CPRS downhole unit will prevent the new buildup of paraffin onto the surface of the production string and also the wellhead facilities

CPRS downhole unit also will be able to remove the existing paraffin buildups if there is any

11.Applications @ Rod Pumping Wells

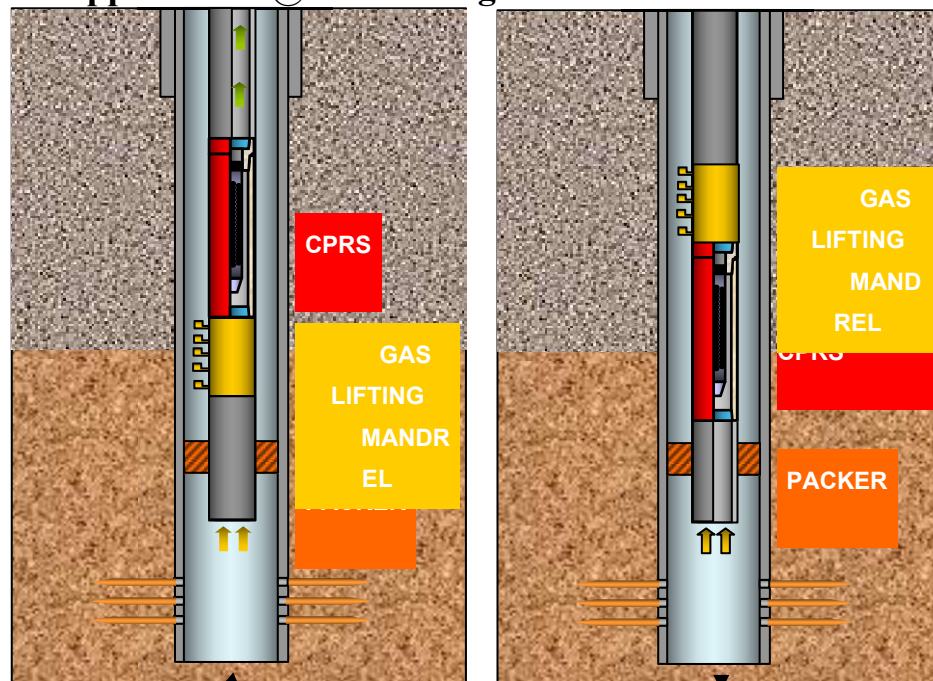


It is recommended to be installed at the bottom of the pumping unit, a couple of joints below the pump, which can prevent any paraffin or scale buildups at the surface of the production string, also, inside the pump itself

Tubing joint style unit is recommended for rod pumping wells, and the unit can be run in and out the well together with the pumping unit

A couple of Chinese downhole pump suppliers, working with Shanghai, employed CPRS downhole unit as an integral part of the pumps and marketed them as “Scale Free” or “Paraffin Free” pumps.

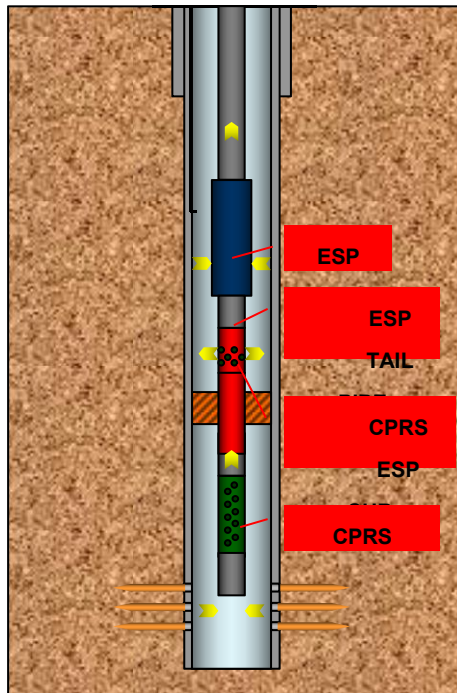
12.Applications @ Gas Lifting Wells



CPRS downhole unit can be installed either at the top of gas lifting mandrel or at the bottom of the gas lifting mandrel depending on the production requirement

Tubing joint style unit is to be recommended for gas lifting well installation

13.Applications @ ESP Wells

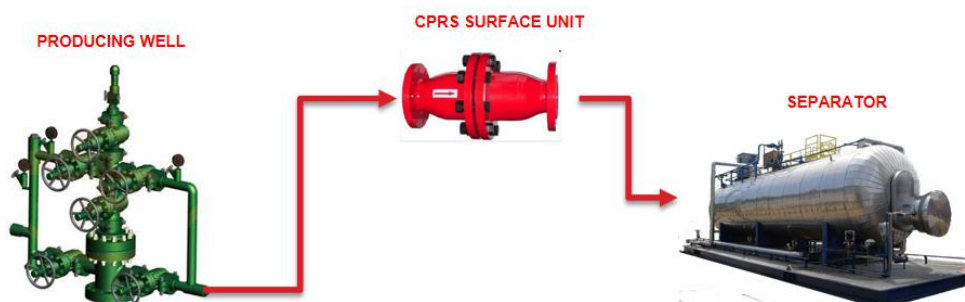


CPRS downhole unit to be installed at the bottom of ESP pump unit, a couple of joints apart

A ESP sub to be installed upper above CPRS unit and down the pumping unit

Oil flows through CPRS unit and out of the ESP sub perforated holes, before entering into ESP

14.Applications @ Production Flowlines



15. Case:

Case #1: Shell Nigeria/Paraffin/Downhole CPRS



After the installation:

De-waxing efficacy was proved a few days after

The production rate increased to 3800BOPD

The well produced for 90 days non-stop

Over 50% in cost savings in comparison with traditional treatments

15 systems were to be installed after the success

Senior Production Technologist Mr. Chiji Onwuzurike call it " a significant breakthrough in de-waxing operations in our wells" .

Case #2: CNOOC Bohai/Scale/Downhole CPRS



Location: Well No.:SZ36-1-J10, SZ36-1Platform

Operator: CNOOC Bohai Oil Company

Before installation:

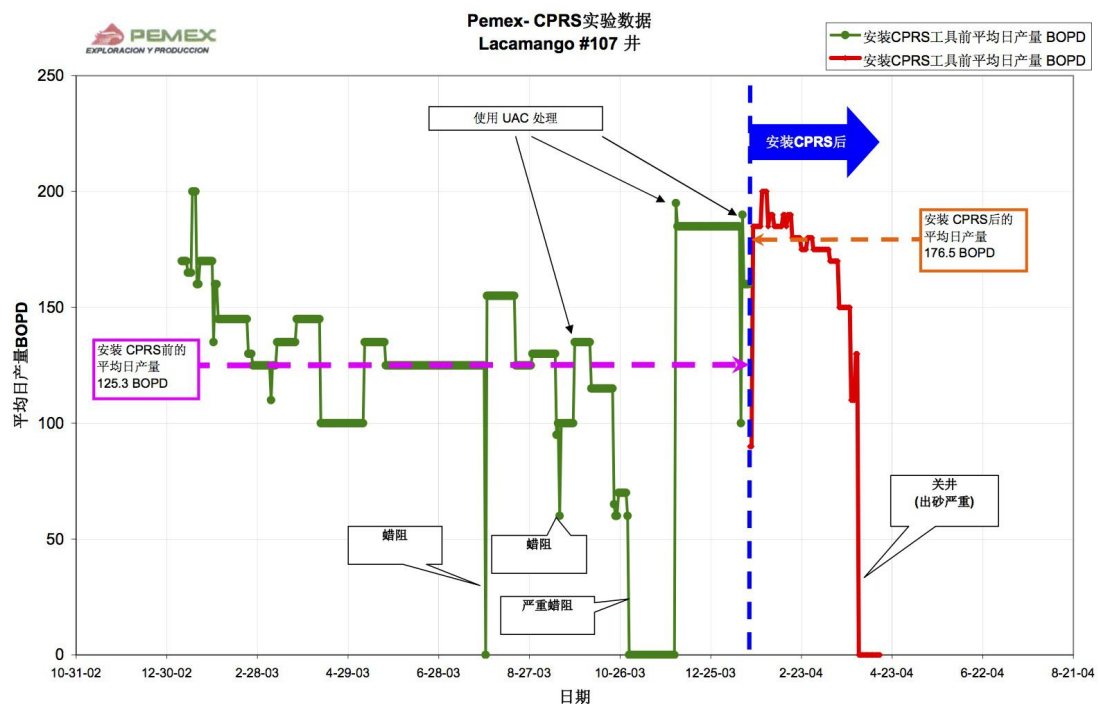
Production started on Dec. 14, 1997 with ESP. The oil production was stabilized above 100 m³/d after acidizing in 1998.

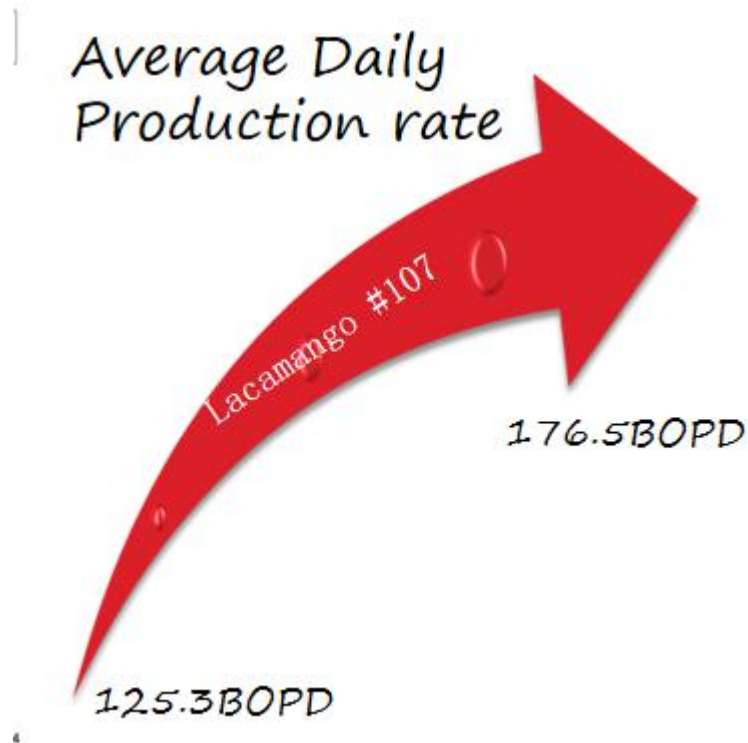
Since mid April, 2005, EPS failed frequently due to scale buildup

A magnetic scale tool was run into the well, but it did not work, failed in a short time, less than 3 months

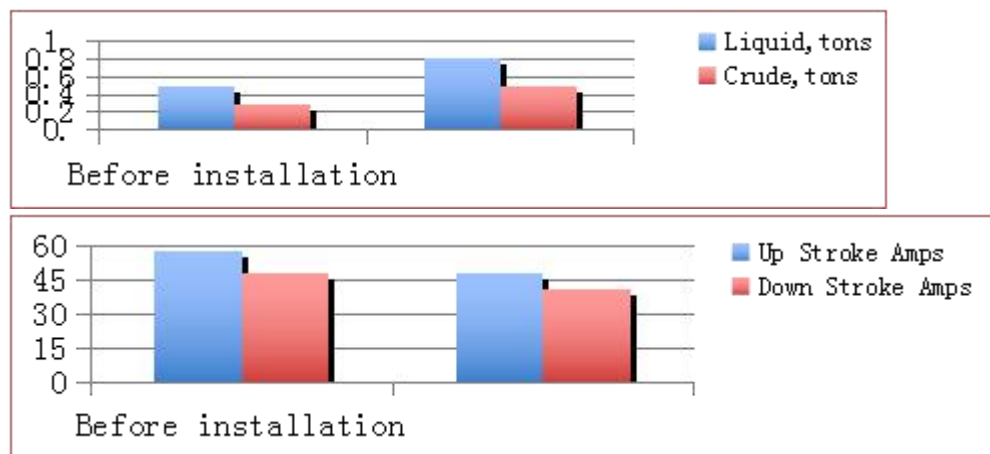
It was concluded that such a frequent pump inspection and repair was mainly caused by the downhole scale buildup, which resulted pump failure and reduced production.

Case #3: PEMEX/Paraffin/Downhole CPRS





Case #4: Sinopec Zhongyuan Oilfield/Paraffin & Scale



Well#: Q2-12

Operator: No.6 Production Company

Downhole issues: Paraffin & Scale

Before the installation

Daily Production: 0.6 tons of Liquid, 0.3 tons of crude

Up stroke Amps: 58; Down stroke Amps: 48

Hot oil treatment frequency: 32 days

After the installation

Daily Production: 0.8 tons of Liquid, 0.5 tons of crude

Up stroke Amps: 48; Down stroke Amps: 41

Hot oil treatment frequency: before the report date, continuous operation for 540 days

16.How Well CPRS Can do?

98% or so success ratio achieved during last 11 years among all the cases for paraffin, scale and corrosion prevention and removal

Thousands of installations done in the oil fields, petrochemical plants, chemical plants, steel mills, electric power plants, and other industries

Hundreds application case study reports from the customer supported

Customers gave it a nick name "magic tool"

Shell Expert called it "A significant breakthrough in de-waxing operations"



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