# 抽油泵 SUBSURFACE SUCKER ROD PUMPS

## 管式抽油泵 TUBING PUMPS

管式抽油泵的下入过程是：泵筒随着油管下到预定深度，柱塞与抽油杆连接下入泵筒。在油管尺寸相同的情况下，可以安装的管式泵比杆式泵大。管式泵结构简单，适用于下泵深度不大、产量较高的油井。

管式抽油泵有固定阀不可拔式（THD）和可拔式（THC、THM）两种。固定阀可拔式管式泵的固定阀由机械或皮碗支撑装置固定并进行密封，在检泵作业时，可以不用起出油管，直接将柱塞和固定阀同时提出。适用于检泵周期短的油井。

The tubing pumps can be sunk into wells in sequence as follows: barrel is run down to the setting depth on the tubing and then plunger with the standing valve on the rod string. For tubing of same diameter, tubing pumps are always of larger capacity than insert pumps. The tubing pump is simple in structure and applicable for wells not too deep and of higher production rate.

Tubing pumps are classified as THD pumps and THC or THM pumps. The standing valve of THC or THM pump can be hold and sealed by a mechanical or cup hold-down. Plunger together with standing valve can be lifted out integrally for normal pump check, with the tubing remain intact. This makes the tubing pumps suitable for wells usually with short pump check intervals.

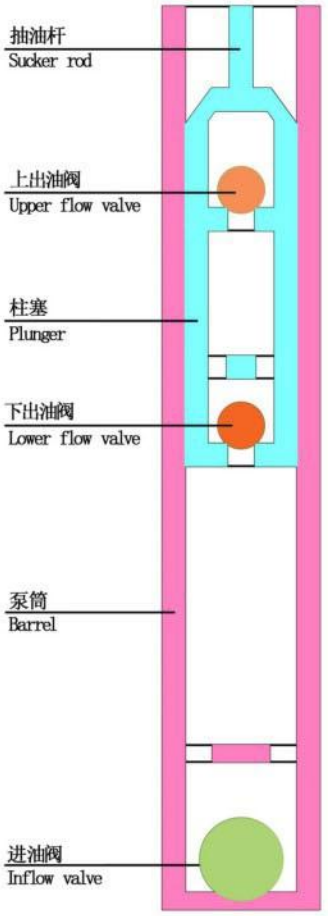
### 管式抽油泵参数
### Specifications for Tubing Pumps

| 型 号Model | 公称直径, mm Nominal Dia.(in) | 柱塞长度, m Plunger Length(ft) | 冲程, m Stroke | 泵常数, $m^3/d$ Pump Constant | 连接油管螺纹 Tubing and Thread | 连接抽油杆, in Sucker Rod |
|---|---|---|---|---|---|---|
| 20–125TH | 32(1.25) | 1.2–1.8(4–6) | 0.6–7.3 | 1.14 | 2 3/8 NU/EU | 3/4 |
| 25–125TH | 32(1.25) | | 0.6–7.3 | 1.14 | 2 7/8NU/EU | 3/4 |
| 20–150TH | 38(1.50) | | 0.6–7.3 | 1.64 | 2 3/8 NU/EU | 3/4 |
| 25–150TH | 38(1.50) | | 0.6–7.3 | 1.64 | 2 7/8NU/EU | 3/4 |
| 20–175TH | 44(1.75) | | 0.6–7.3 | 2.24 | 2 3/8 NU/EU | 3/4 |
| 25–175TH | 44(1.75) | | 0.6–7.3 | 2.24 | 2 7/ 8 NU/EU | 3/4 |
| 25–200TH | 50(2.00) | | 0.6–7.3 | 2.92 | 2 7/ 8 NU/EU | 3/4 |
| 25–225TH | 57(2.25) | | 0.6–7.3 | 3.69 | 2 7/8 NU/EU | 3/4 |
| 30–250TH | 63(2.50) | | 0.6–7.3 | 4.56 | 3 1/2 NU/EU | 7/8 |
| 30–275TH | 70(2.75) | | 0.6–7.3 | 5.50 | 3 1/2 NU/EU | 7/8 |
| 30–325TH | 83(3.25) | | 0.6–7.3 | 7.70 | 4 NU/EU | 7/8 |
| 40–375TH | 95(3.75) | | 0.6–7.3 | 10.26 | 4 1/2 NU/EU | 1 |

# 管式抽油泵
# Tubing pump

该泵是在普通泵的基础上研制的。其柱塞表面喷焊镍基合金，泵筒内壁镀硬铬，阀罩、阀球等关键零部件均采用耐蚀性能强、机械性能优的材料制造。该系列泵具有优良的耐腐蚀性能和耐磨性能，其使用寿命比普通泵高1～3倍。

The pump is developed on the base of conventional pump. Surface of the plunger is sprayed with nickel base alloy, inside well of the barrel is plated with hardness chrome, the key parts such as valve case, ball and seat are made of strong corrosion-resisting and excellent mechanical properties material. For outstanding properties of corrosion-resisting and wear-resisting, service life of the pump is 1-3 times longer than the conventional pump.




## 主要技术参数 The main technical parameters

| 泵径 Pump bore (mm) | 柱塞长度 Length of plunger (m) | 泵筒长度 Length of barrel (m) | 冲程范围 Range of stroke (m) | 泵常数 Pump constant | 联接抽油杆规范 Size of connecting sucker rod | 联接油管规范 Size of connecting tubing (in) |
|---|---|---|---|---|---|---|
| 32 | 0.6～1.2 | 2.1～7.5 | 1.2～6.0 | 1.14 | CYG19 | 2 3/8 TBG |
| 38 | | | | 1.64 | CYG19 | 2 7/8 TBG |
| 44 | | | | 2.23 | CYG19 | 2 7/8 TBG |
| 57 | | | | 3.69 | CYG19 | 2 7/8 TBG |
| 70 | | | | 5.52 | CYG22 | 3 TBG |
| 83 | | | | 7.70 | CYG22 | 3 1/2TBG |
| 95 | | | | 10.26 | CYG25 | 4 TBG |

注：理论排量 Q=K·S·N（米³/日）
K-泵常数　S-冲程（米）　N-冲次（次/分）
Note：The calculation of the displacement Q= K·S·N（m³/d）
K-pump constant　S-range of stroke（m）　N-strokes per minute（s/min）

# 杆式抽油泵 INSERT PUMPS

杆式抽油泵在地面整体组装后，接到抽油杆的下端，整体通过油管下入井内。检泵时不需起下油管，作业方便，适合于深井。由于缩短了作业时间，减少油管上卸扣的次数，所以延长了油管的使用寿命。杆式抽油泵根据支承总成类型可分为机械式和皮碗式，按支承位置分成定筒式顶部固定、定筒式底部固定和动筒式底部固定三种。

The insert pump can be connected to sucker rod on the surface and then lowered into the wells integrally through the tubing. Pump checks are easy and without the need of pulling and running the tubing. This makes it especially suitable for deep well applications. Reduced running time and make-and-breaks can surely enhance tubing working life. Insert pumps are clarified as mechanical and cup hold-down pumps by hold-down types or as top hold-down, bottom hold-down and traveling barrel insert pumps by hold-down positions.

## 杆式抽油泵参数

## Specifications for Insert Pumps

| 型 号Model | 公称直径, mm Nominal Dia.(in) | 柱塞长度, m Plunger Length(ft) | 冲程, m Stroke | 泵常数, $m^3/d$ Pump Constant | 连接油管螺纹 Tubing and Thread | 连接抽油杆, in Sucker Rod |
|---|---|---|---|---|---|---|
| 25–112RHAC/M | 28(1.12) | 1.2–1.8 (4–6) | ≤7.5 | 0.92 | 2 7/8 NU/EU | 3/4 |
| 20–125RHAC/M | 32(1.25) | | | 1.14 | 2 3/8 | 3/4 |
| 25–150RHAC/M | 38(1.50) | | | 1.64 | 2 7/8 | 3/4 |
| 25–175RHAC/M | 44(1.75) | | | 2.24 | 2 7/8 | 3/4 |
| 30–225RHAC/M | 57(2.25) | | | 3.69 | 3 1/2 | 3/4 |
| 20–125RHBC/M | 32(1.25) | | | 1.14 | 2 3/8 | 3/4 |
| 25–150RHBC/M | 38(1.50) | | | 1.64 | 2 7/8 | 3/4 |
| 25–175RHBC/M | 44(1.75) | | | 2.24 | 2 7/8 | 3/4 |
| 30–225RHBC/M | 57(2.25) | | | 3.69 | 3 1/2 | 3/4 |
| 20–125RHTC/M | 32(1.25) | | | 1.14 | 2 3/8 | 3/4 |
| 25–150RHTC/M | 38(1.50) | | | 1.64 | 2 7/8 | 3/4 |
| 25–175RHTC/M | 44(1.75) | | | 2.24 | 2 7/8 | 3/4 |
| 30–225RHTC/M | 57(2.25) | | | 3.69 | 3 1/2 | 3/4 |

# 特种泵 SPECIALTY SUCKER ROD PUMPS

特种抽油泵适用于含砂井、含气井、稠油井、斜井、分层开采油井、无油管采油等不同类型油井的开采，在各油田均有应用，收到了良好的使用效果。

根据现场使用情况及用户要求，设计、加工制造各种特种抽油泵及其零部件，包括：

1、泵筒制造采用深井电镀、强力珩磨等先进工艺，整筒电镀长度可达11米，各种杆类、筒类零件的电镀长度可达11米；

2、镀铬及镍基喷焊等各种柱塞；

3、不锈钢、陶瓷、硬质合金等不同材料的系列高精度阀球阀座。

Specialty sucker rod pumps are applicable for sand, live or high viscous wells, slant wells, or for use in zonal production or casingless production. They have been used in many oilfields with good efficiency.

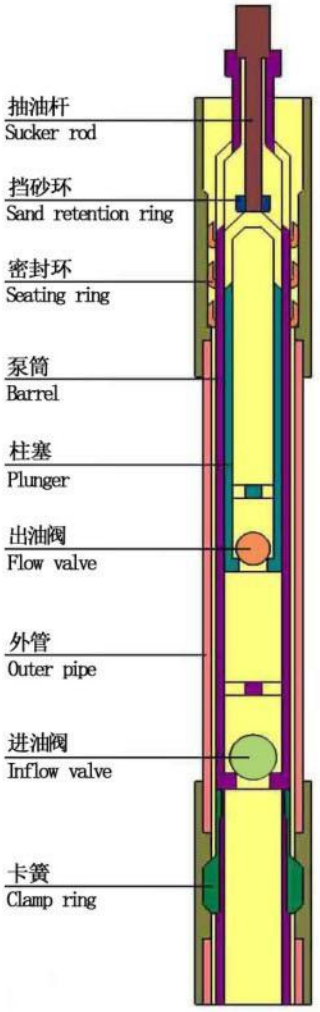
Various types of specialty pumps and accessories as follows can be designed and made for actual applications and upon client's request:

1. Plungers electroplated in deep well and then forcefully honed on machines, with electroplated length up to 11m for plungers, rods and barrel items;
2. Optional chrome-plated plungers or Ni-Base coated plungers by spray welding processes;
3. High precision valve balls and seats in various materials such as stainless steel, ceramic and carbide.

# 杆式抽油泵
## Rod pump

杆式抽油泵可整体随抽油杆下入油管中，检泵作业可不提油管，且泵筒受力较小，尤其适用于深抽，对于斜井及含砂和粘度较大的井也比较适用。该泵的性能及技术要求符合API标准和GB/T18607-2008标准规定。

The pump can be run into the oil tube with the sucker rod as an integer and it is not necessary to lift the tubing string when serving the pump. For the load on the barrel is smaller , the pump is very suitable for deep sucking , and also suitable for inclined well and sandy well and high viscosity oil well. Main parameters and specifications of the pump are conform with API standards and GB/T18607-2008 standard.




## 主要技术参数 The main technical parameters

| 泵径 Pump bore ( mm ) | 柱塞长度 Length of plunger ( m ) | 泵筒长度 Length of barrel ( m ) | 联接油管规范 Size of connecting tubing ( in ) | 冲程范围 Range of stroke ( m ) | 泵常数 Pump constant | 联接抽油杆规范 Size of connecting sucker rod | 最大外径 Max outside diameter ( mm ) |
|---|---|---|---|---|---|---|---|
| 32 | 1200 | 4.267~7.315 | 2 7/8TBG | 3.0~6.0 | 1.14 | CYG19 | 56 |
| 38 | | | | | 1.14 | | 56 |
| 38 薄壁 Thin-wall | | | | | 1.64 | | 51 |
| 44 | | | | | 2.23 | | 59.3 |

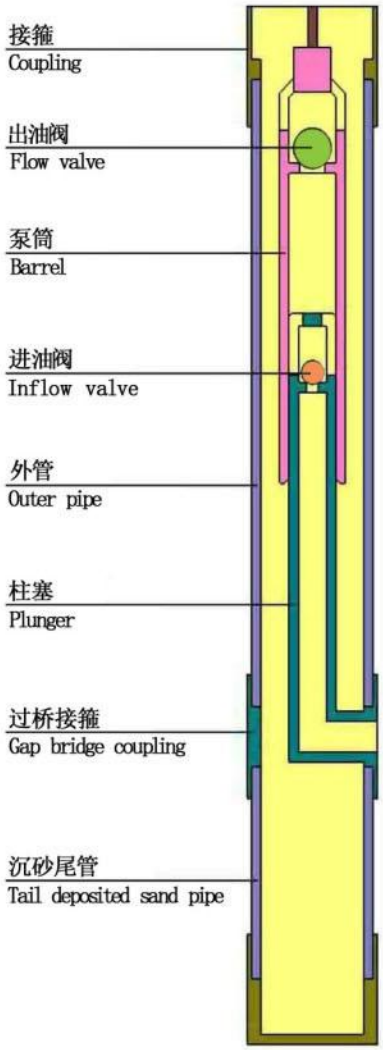
注：理论排量 Q=K·S·N ( 米³/日 )
K-泵常数 S-冲程 ( 米 ) N-冲次 ( 次/分 )
Note : The calculation of the displacement Q= K·S·N ( m³/d )
K-pump constant S-range of stroke ( m ) N-strokes per minute ( s/min )

# 动筒式防砂抽油泵

## Traveling barrel tubing pump for preventing from sand wedging

该泵采用固定柱塞、运动泵筒式结构。具有结构简单，流线型流道，抽油杆不易断脱，柱塞不易砂卡、砂埋，耐腐蚀、耐磨损、寿命长等优点，适用于出砂严重的油井。

The pump has a simple structure of a standing plunger and a traveling barrel. The flow path of the pump is designed and manufactured as a streamlined structure. The sucker rod of the pump is difficult to split and the plunger has advantages of corrosion-resisting and wear-resisting and long service life , so it is difficult for sand wedging and sand deposit in the barrel. The pump is suitable for serious sandy wells.




## 主要技术参数 The main technical parameters

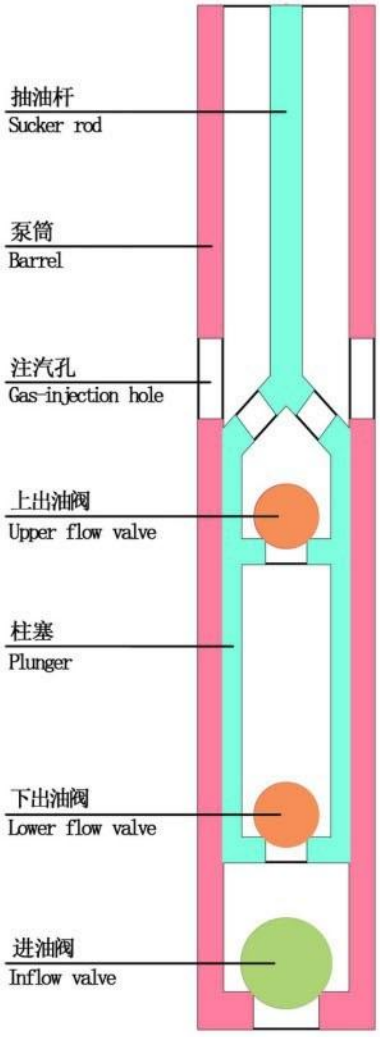
| 泵径 Pump bore ( mm ) | 柱塞长度 Length of plunger ( m ) | 泵筒长度 Length of barrel ( m ) | 联接油管规范 Size of connecting tubing ( in ) | 冲程范围 Range of stroke ( m ) | 泵常数 Pump constant | 联接抽油杆规范 Size of connecting sucker rod | 最大外径 Max outside diameter ( mm ) |
|---|---|---|---|---|---|---|---|
| 38 | 1.1 | 4.5、6.6 | 3 1/2 TBG | 4.5-6 | 1.64 | CYG19 | 100 |
| 44 | | | 3 1/2 TBG | | 2.23 | CYG19 | 100 |
| 57 | | | 4 TBG | | 3.69 | CYG19 | 108 或 114 |

注：理论排量 Q=K·S·N ( 米³/日 )
K-泵常数 S-冲程 ( 米 ) N-冲次 ( 次/分 )
Note : The calculation of the displacement Q= K·S·N ( m³/d )
K-pump constant S-range of stroke ( m ) N-strokes per minute ( s/min )

# 碰泵式热采抽油泵
## Bumping pump for sucking hot oil

该泵主要适用于原油粘度高而井口又配有注汽（降粘）装置的油井。可实现不动管柱进行注汽→转抽工作循环。注汽（或其它降粘剂）时，下放柱塞“碰泵”，蒸汽即可经注汽孔注入井底。转抽时，上提防冲距0.8米，即可正常工作。

The pump is mainly suitable to be used in high-viscosity well , on the mouth of which a set of vapour-injection ( viscosity-breaking ) have been set up. The work circulation of injecting vapour→rotaty sucking can be realized without moving the tubing string. When vapour ( or other viscosity-breaker ) is being injected , lay down the plunger to "bump the pump" , then vapour can be injected to the bottom of the well. When rotating sucking , distance of lifting the plunger to avoid bumping is 0.8m , then it can work normally.




## 主要技术参数 The main technical parameters

| 泵径 Pump bore (mm) | 柱塞长度 Length of plunger (m) | 泵筒长度 Length of barrel (m) | 冲程范围 Range of stroke (m) | 泵常数 Pump constant | 联接抽油杆规范 Size of connecting sucker rod | 联接油管规范 Size of connecting tubing (in) |
|---|---|---|---|---|---|---|
| 32 | 1.5+1.5 | 6.0～7.8 | 2.4～3.3 | 1.14 | CYG19 | 2 7/8 TBG |
| 38 | | | | 1.64 | | 2 7/8 TBG |
| 44 | | | | 2.23 | | 2 7/8 TBG |
| 57 | | | | 3.69 | | 2 7/8 TBG 或3 TBG |

注：理论排量 Q=K·S·N（米³/日）
K-泵常数　S-冲程（米）　N-冲次（次/分）
Note : The calculation of the displacement Q= K·S·N ( m³/d )
K-pump constant　S-range of stroke ( m )　N-strokes per minute ( s/min )

# 注汽热采一次管柱泵
## Steam injection thermal recovery single-use string pump

注汽抽油泵是针对稠油举升特点而研制的。该泵的正常工作过程与普通泵不同之处在于可以用于斜井、水平井等特殊井况。当需要注汽时，将抽油杆上提，则柱塞也随之上提，当柱塞高于密封筒约200mm的位置时，密封筒上的注汽孔与上部油管管柱联通，即可进行注汽作业。

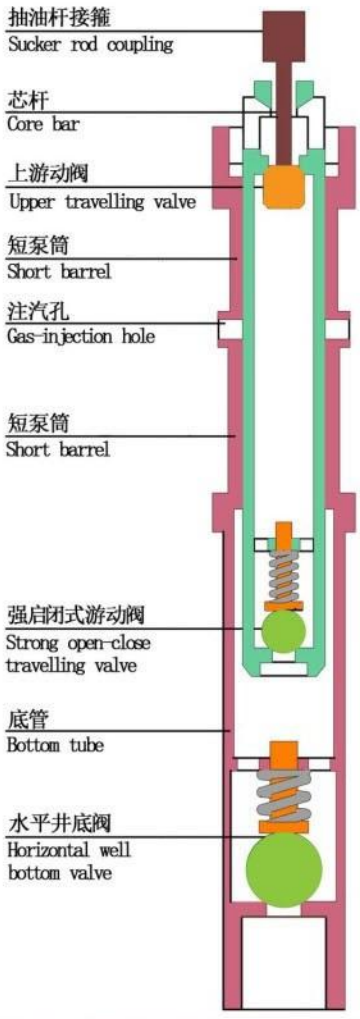
注汽作业完成后，将抽油杆回落，柱塞也随之回落到工作位置。此时，柱塞进入泵筒之内并将注汽孔封住，经过调整防冲距离后，抽油泵系统即可进入工作状态。

该泵与整筒管式抽油泵下泵作业方式相同。

Steam injection pump is developed according to the characteristics of the heavy oil lifting, the difference of the normal work process of this pump from the common pump is that it can be used for special well conditions, such as deviated well and horizontal well etc. When steam injection, lifting the sucker rod, the plunger will lift accordingly, when the plunger is higher than the sealed chamber about 200 mm, the steam injection hole of the sealing tube and the upper tubing string will be linked together, thus steam injection operation can be achieved.

After the completion of the steam injection operation, the sucker rod fall back, the plunger will also be back to work location. At this point, the plunger enter the pump barrel and seal the steam injection hole, after adjust the impingement distance, sucker rod pump system can return to the working state.

The operation mode of this kind of pump is the same as subsurface tubing pump.




## 主要技术参数 The main technical parameters

| 泵径 Pump bore (mm) | 柱塞长度 Length of plunger (m) | 泵筒长度 Length of barrel (m) | 联接油管规范 Size of connecting tubing (in) | 冲程范围 Range of stroke (m) | 泵常数 Pump constant | 联接抽油杆规范 Size of connecting sucker rod | 最大外径 Max outside diameter (mm) |
|---|---|---|---|---|---|---|---|
| 44 | 4.2～7.8 | 1.2+1.2 | 2 7/8 TBG | 3.0～6.0 | 2.23 | CYG19 | 88.5 |
| 57 | | | 2 7/8 TBG | | 3.69 | CYG19 | 88.5 |
| 70 | | | 3 1/2 TBG | | 5.52 | CYG22 | 108 |

注：理论排量 Q=K·S·N（米³/日）

K-泵常数　　S-冲程（米）　　N-冲次（次/分）

Note：The calculation of the displacement Q= K·S·N（m³/d）

K-pump constant　S-range of stroke（m）　N-strokes per minute（s/min）