顶塞　底塞

Top Plug & Bottom Plug

使 用 维 护 说 明 书

USER MANUAL

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1、产品简介及特点 PRODCT USAGE AND FEATURE：

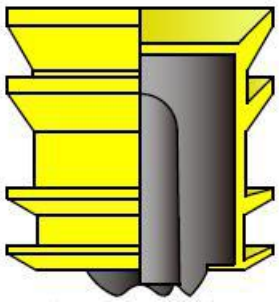
简介 Introduction：

固井胶塞分为标准固井胶塞和防转型固井胶塞。固井胶塞可以保证水泥各层的分离，刮削套管内壁，隔离水泥浆。当胶塞坐落在浮箍上（碰压座）时，能准确地显示出泥浆顶替位置和套管的密封性能。固井胶塞符合中国石油行业标准 SY/T7084-2016，同时符合 API 标准。固井上胶塞又称顶塞，可单独使用于单塞固井作用中。固井下胶塞是空心，并有一层橡胶膜隔开。

The cement plug contains Standard Cement Plug and Non-Rotating Cement Plug. The plugs maintain separation of cementing fluids, wipe casing walls clean, and prevent cement contamination. When bumped against a float collar, they provide positive indication of displacement and casing sealing ability.

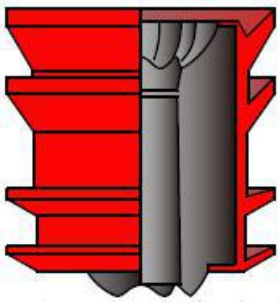
The cement plug comply with China's oil industry standards SY/T7084-2016, also comply with API standards. Top Plug, can be individually applied to single plug cementing. Bottom Plug is hollow and has a rubber membrane separated.

Standard Top Cement Plug



Non-Rotating Top Cement Plug

Standard Bottom Cement Plug



Non-Rotating Bottom Cement Plug

特点 Features:

●标准型固井胶塞适用于各种浮箍、浮鞋；防转型固井胶塞适用于防转型浮箍、浮鞋；STD. cement plugs are designed for compatibility with all types of float equipment; Non-Rotating cement plugs are for non-rotating float equipment.

●胶塞体的材料是丁腈橡胶，胶塞芯子是高分子材料，PDC 钻头或牙轮钻头可钻；

Plug body material is nitrile rubber, Plug core material is polymer（plastic）materials，Neither PDC nor rock bit drillable；

●防转型胶塞设计有防转机构,可大幅提高钻除速度；

Special anti-rotation mechanism to drill out faster.

●根据需求，胶皮碗有 4 个或者 5 个；

According to the demand, there are 4 or 5 rubber bowls.

2、主要技术参数 MAIN TECHNICAL PARAMETERS：

性能参数 Specification				
套管尺寸 Casing size		胶塞尺寸 Plug size		
外径 O.D in	重量 Weight lbs/ft	最大外径 Max O.D. in	胶塞长度 Length, in	
			STD.	Non-R
4 1/2	9.5-16.9	4.331	7.83	8.27
5	11.5-20.8	4.803	7.83	8.27
5 1/2	14.0-26.8	5.315	7.83	8.27
6 5/8	24.0-32.0	6.693	9.17	9.72
7	17.0-38.0	6.693	9.17	9.72
7 5/8	24.0-42.8	7.283	9.28	9.76
8 5/8	24.0-49.0	8.270	9.06	9.76
9 5/8	32.3-53.5	9.252	9.06	9.76
10 3/4	40.5-65.7	10.236	9.69	10.63
11 3/4	42.0-87.2	11.260	9.88	10.83
13 3/8	48.0-72.0	13.110	11.85	13.74
14	82.5-138.8	13.110	11.85	13.74
16	65.0-84.0	15.870	15.79	17.87
18 5/8	73.0-87.5	19.606	17.05	19.09
20	94.0-133.0	19.606	17.05	19.09

- 固井下胶塞胶膜破裂压力;

  Bottom Cement Plug Rubber membrane burst pressure, 1-3MPa;

- 耐温 Temperature rating at 120℃;
- 胶塞碰压后的密封压力值 Sealing pressure value of cement plug：

固井胶塞规格 Cement plug Size, in	密封压力值 Sealing pressure value of cement plug
4-1/2~7-5/8	≥5000psi
8-5/8~11-3/4	≥3000psi
≥13-3/8	≥2000psi

- 防转胶塞啮合后传递扭矩值不低于 300N・M

  Non-Rotating Cement Plug has a torque of not less than 300N•M after meshing.

3、固井胶塞的技术要求 TECHNICAL PARAMETERS：

3.1 固井胶塞的胶料应耐油、耐酸、耐碱，其性能应符合以下要求：

3.1 Cement Plug rubber material can withstand oil, acid, alkali, and its performance should meet the following requirements:

3.1.1 抗拉强度 Tensile strength：Rm≥20MPa；

3.1.2 绍尔硬度 Share A hardness：60~80；

3.1.3 老化系数 Air aging coefficient：≥0.85（120℃，24h）；

3.1.4 体积膨胀率 Volume expansion： In the 15 immersion oil or mud 24h, volume expansion should be less than 3%；

3.1.5 体积膨胀率 Elongation：≥300%。

3.2 固井胶塞主体及表面不应有杂质、起泡、裂缝及厚度不匀等缺陷 Cement Plug the body and the surface should not have impurities, bubbles, defects such as cracks and uneven thickness.

4、现场使用 FIELD OPERATION PROCEDURES：

4.1 首先把固井上胶塞和固井下胶塞分别安装在双塞水泥头内，注意不要装错。

First, the Top Cement Plug and Bottom Cement Plug is installed in the double plug cement head, the note do not install the wrong.

4.2 注水泥浆之前，旋转水泥头下胶塞挡销，释放固井下胶塞。

Before cementing, rotary cement head of the Bottom Cement Plug blocked off, the release

of Bottom Cement Plug.

4.3 注水泥作业，注完水泥浆后，旋转水泥头上胶塞挡销，释放固井上胶塞。

Cementing operation, cement end, the rotating cement head of the Top Cement Plug blocked off, the release of Top Cement Plug.

4.4 替浆，此时固井下胶塞、固井上胶塞，以及两者之间的水泥浆一起在套管中下行。

Replacement mud, then Bottom Cement Plug, Top Cement Plug, and the grout between the casing down together.

4.5 当固井下胶塞下行到浮箍或者碰压环位置，在压差大于 2~3MPa 时，固井下胶塞的胶膜破裂，水泥浆通过固井下胶塞内孔进入套管与井眼之间的环空间隙。

When the Bottom Cement Plug downward pressure to the float collar or landing collar location, when the pressure is greater than 2 ~ 3MPa, Bottom Cement Plug rubber membrane rupture, the slurry through the Bottom Cement Plug into the hole between the casing and the borehole annular clearance.

4.6 当固井上胶塞下行到浮箍或者碰压环位置以上时，固井上胶塞和固井下胶塞复合，碰压。

When the Top Cement Plug touch down to the float collar or the location of landing collar above, Top Cement Plug and Bottom Cement Plug compound, bump-pressure.

4.7 井口放回水，检查浮箍、浮鞋的防回压情况，卸水泥头，候凝。

Wellhead back into the water, check the float collar, float shoe anti-back-pressure conditions, removed cement head, WOC.

5、钻除固井胶塞的推荐方法 CEMENTING PLUG DRILLING-OUT：

固井胶塞都是由可钻性好的材料组成，以便于钻除。钻固井胶塞时的注意事项及推荐的钻进参数如下：

The Cementing Plug are all made of drillable material. The following are the notes and drilling parameters when drilling out the accessories:

5.1 应选用适应钻硬地层的牙轮钻头或钻中—硬地层的 PDC 钻头。

Use a rock bit, which is for hard formation or a PDC bit, which is for medium-hard formation.

5.2 钻进中不要使用自动送钻装置。

Do not use an automatic driller.

5.3 可在钻具上配备扩眼器和稳定器。必要时也可装一个打捞篮。

A reamer or stabilizer can be installed on the drill string. A fishing cup can also be installed when necessary.

5.4 转速不能超过 100rpm.The rotation speed should not exceed 100rpm.

5.5 如使用井底动力钻具，钻压应不超过 2.5t。

If a down-hole motor driller is used, the WOB should not exceed 2t.

5.6 不得将钻头压在附件上再启动转盘转动钻具。

Rotate the rotary table before the bit is pressed on the accessories.

5.7 每钻进 5cm 应上提活动一次，活动时不停泵，并保持钻具转动，以清除钻头周围的橡胶/金属屑。

The drill string should be lifted and lowered after drilling every 5cm. Meanwhile, do not stop circulation while moving the drill string in order to carried out the debris.

5.8 当发现钻速降低时，应调整钻进参数；若无效，则应提钻检查钻头，查明原因。

Drilling parameters should be adjusted when the drilling rate slows down. If that still does not work, trip out and check the bit and analyze the reason.