常宝股份
CHANGBAO

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User Manual of Casing and Tubing

CBS3 Connection for Tubing and Casing

Jiangsu Changbao Steel Tube Limited Co.

I. On-site Placement, cleaning, drift, inspection and measurement

1. Placement

The pipes should be placed on a platform without stones, sand or mud. The distance from the ground should not be less than 0.5 meters. Each pipe should have at least three support points; it should have enough space to rotate 360º for cleaning and checking the threads. Do not remove the protectors prematurely before confirming usage to avoid rust on the thread surface.

Figure 2 On-site placement

2. Remove the protectors

Be careful when remove the protectors, to avoid contact with threads and sealing surfaces when using pipe wrenches or other tools. If the protector is difficult to remove, it should be removed by vibrating the pipe body. It is not allowed to remove the protectors by directly knocking the protective cap, to avoid unnecessary damage to the thread or sealing surface.

3. Cleaning

Unused fresh water high-pressure steam should be used together with water-soluble cleaning agents to completely remove the storage compound and dirt to make the threads and sealing surfaces smooth and clean.

Figure 3 Thread cleaning

Precautions for cleaning threads are as follows:

3.1 Use a non-metallic soft brush or waste wire to absorb the cleaning agent, then wipe and clean the compound on the thread surface.

3.2 When cleaning the thread surface at low temperature, make sure to remove water stains on the thread surface to prevent ice from affecting the make-up engagement.

3.3 After cleaning completed, it should be confirmed that there is no sewage inside the pipe body to avoid secondary pollution during subsequent lifting.

3.4 After drying the threads, a clean thread protector should be installed. If compressed air is used for drying, sand and gravel should be avoided from blowing up and adhering to the surface of the threads, causing secondary pollution.

4. Drift

Before going down the well, the pipes should be drifted one by one from the box end to pin end. It is recommended to carry out drift on the pipe frame and use a nylon drift mandrel to avoid bumping the threads, sealing surfaces and coupling shoulders during drift.

5. Visual inspection and thread inspection

5.1 Check damage caused during transportation or lifting, focusing on checking protectors.

5.2 The thread surface should be free of burrs, tears, scratches and any defects that damage the continuity of the thread. When the thread is found to be slightly defective or rusty, it can be repaired with oilstone or emery cloth, and the thread parameters can be measured after repair.

5.3 Check all internal and external thread sealing surfaces for defects. If there are small stains or slight floating rust on the sealing surface, repair it with scouring pad or 400 mesh emery cloth. The

size of the sealing surface is acceptable; if there are excessive scratches and Defects such as scratches, dents, etc. shall be marked on the pipe material and isolated.

6. Pipe length measurement

Before running, measure the length of each pipe. Should be used a steel tape with a measurement accuracy of up to millimeter. Measure the total length (LT) minus the loss length (ML). The measurement of the make-up loss length is shown in the figure below. Effective length of each pipe (LE) = full length (LT) - make-up loss length (ML)

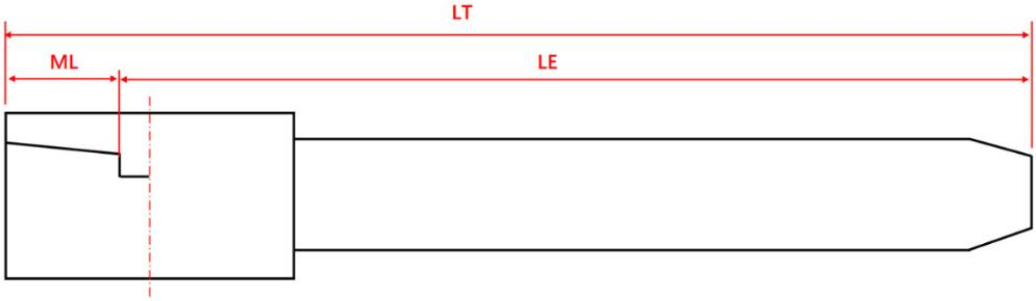


Figure 4 Pipe length measurement

II. On-site information confirmation

The following information needs to be checked on site:

1. The batch number, pipe number, specification, steel grade and other information of the tubing furnace arriving at the site should be recorded, and correspond one-to-one with the well entry number for easy traceability.

2. It is recommended to use Bestolife 2000 thread compound, and it must be within the shelf life.

3. Check whether the sizes of elevators, slips, jaws and other tools match the pipe size. Should be given to using tooth plates without tooth marks or teeth with micro-marks.

4. Check the function of the torque monitoring equipment. It has the ability to monitor the torque circle curve. The make-up torque can be set according to the manufacturer's requirements, and the torque curve data can be copied.

5. Check whether the calibration of the torque and tension sensor of the screwing tong used in the operation is within the validity range.

6. Check the torque capacity of the screwing tongs. It is recommended that the maximum torque

capacity of the tongs should be 1.5 times the recommended maximum torque of the buckle type products.

III. Running operation

1. Lifting

During the lifting of the pipe, protectors should be installed. It is prohibited to use large hooks to directly contact the internal threads of the couplings during the lifting process to avoid collision with platform equipment and other equipment.

2. Inspection of threads and sealing surfaces

Lift the pipe to a vertical position, remove the protectors, clean the thread surface with compressed air or cleaning agent, and check the threads and sealing surface again to ensure that the threads are not damaged.

3. Apply thread compound

Thread compound needs to be applied evenly. It is recommended to use a soft-bristled brush, steel brushes are prohibited. The threads and sealing surfaces should be dry and clean, and there should be no water or other dirt. It is best to apply thread compound when the pipe is about to be connected to reduce contamination and solidification. In particular, the thread compound on the sealing surface and sealing shoulder must be evenly applied.

Figure 5 Brush selection

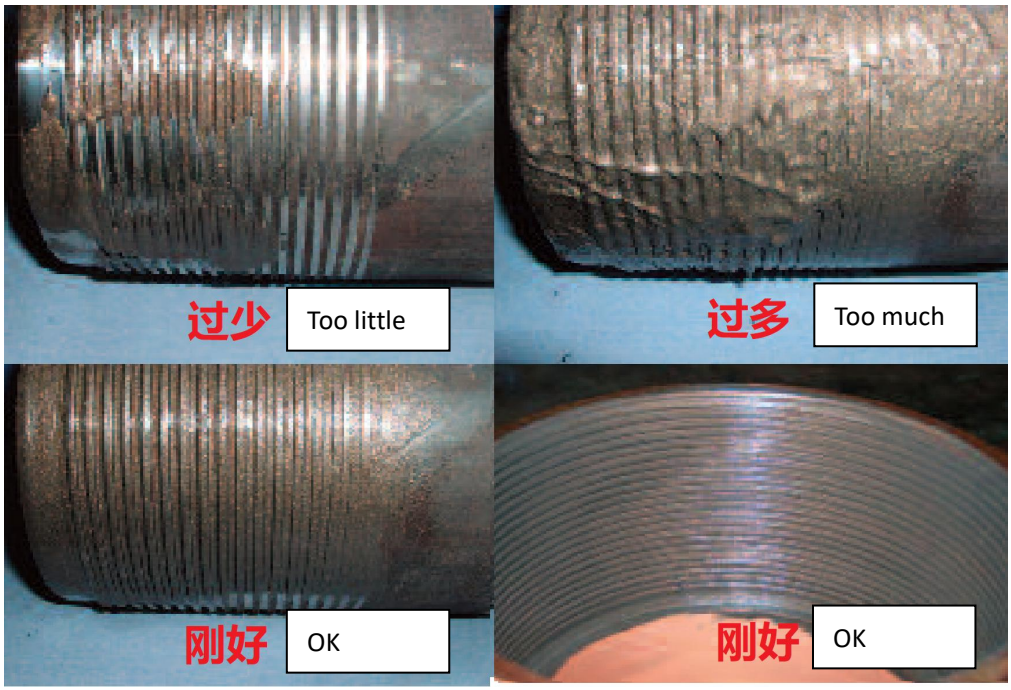


Figure 6 Thread compound application

4. Torque value setting

The make-up torque value is set according to the value recommended in this document. (due to abnormal weather such as wind and sand, differences in the amount of thread compound, pipe alignment, matching degree of the tongs, sensor accuracy and other factors, make-up abnormalities may occur, the final make-up torque value can be adjusted according to the specific conditions on site, but it must be confirmed by Changbao.)

5. Stabbing and make-up

5.1 **Stabbing**

Must ensure that the upper and lower pipes are aligned, and a stabbing guide is required to avoid unnecessary thread damage. During stabbing, operate carefully to avoid collision with the pin sealing surface. If the pipe tilts to one side after stabbing, it should be lifted up to check whether the threads are damaged. If there is damage, use whetstone or emery cloth to repair it. After passing the inspection, re-apply thread compound to stabbing.

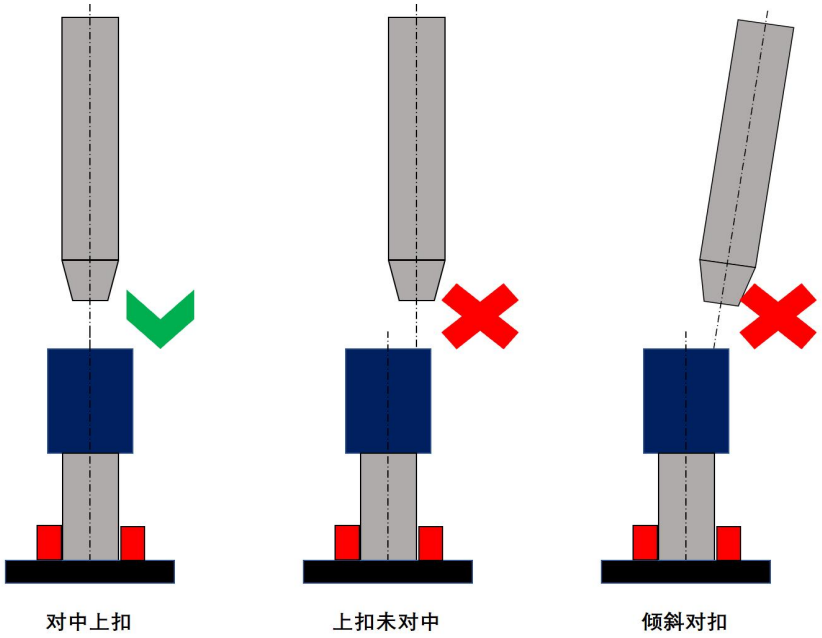


Figure 7 stabbing

Figure 8 Usage of stabbing

5.2 Make-up

For screwing equipment, it is preferred to use large tongs with backup tongs. Both main and backup tongs should be clamped in the appropriate position of the pipe body, and the make-up speed should be as required in the table.

Make-up speed requirement			
Material	**Stabbing stage**	**Make-up stage**	
	First 2-3 laps	**After 2-3 laps**	**final stage**
Carbon steel and low alloy steel（API Steel Grade）	**Manual or low speed for stabbing**	**High speed, maximum 15 rpm**	**Low speed, maximum 5rpm**
High alloy steel（9Cr、13Cr）	**Manual, till cannot screw**		**Low speed, max. 3rpm.**

Figure 9 Make-up clamping position

6. Break-out and lift

If an abnormal situation occurs during the following well operations and it is necessary to lift the pipe, the following matters need to be paid attention to:

6.1 Break-out used the large tongs at low speed, and the backup tongs should be clamped at the lower part of the coupling;

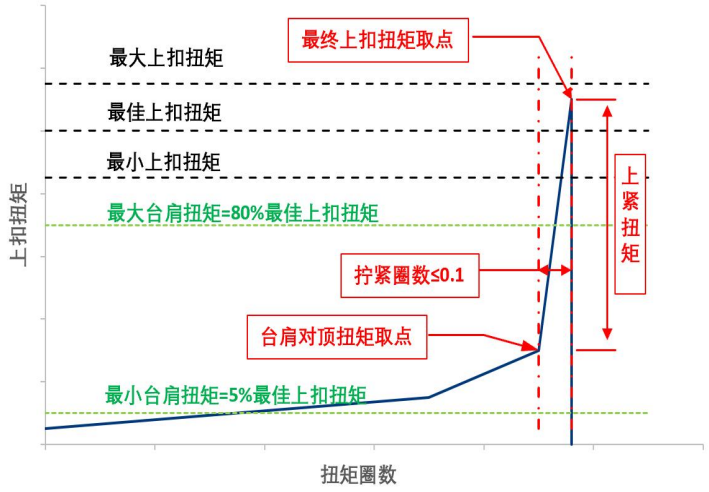
6.2 After ensuring that the internal and external threads are completely disengaged, stop rotating the pipe body. Before the pin thread is lifted out of the coupling, it must be slowly lifted to prevent damage to the thread.

6.3 If the proposed pipe is stored on the derrick in the form of a column, protectors should be installed.

6.4 If the proposed pipe needs to be stored for a period of time, it should be cleaned, inspected and applied with thread compound as required, and the protectors should be installed for next use.

6. Analysis and acceptance of make-up graphics

Each coupling should be make-up with a torque/number of turns curve. After make-up, check the torque curve on the torque meter and determine whether it is qualified.

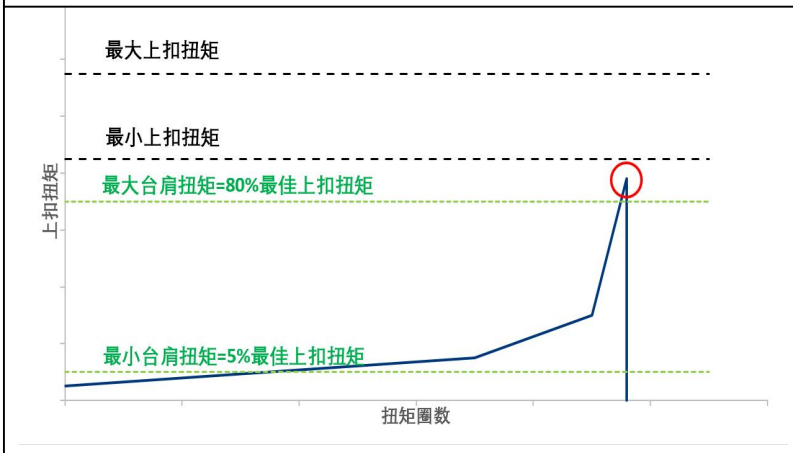
Standard make-up graphics	Disposal method
	acceptable

Note: Due to factors such as different horizontal and vertical coordinate collection resolution settings of the recording instrument, the on-site make-up torque curve cannot be completely consistent with the standard make-up graphic, but the following requirements must be met:

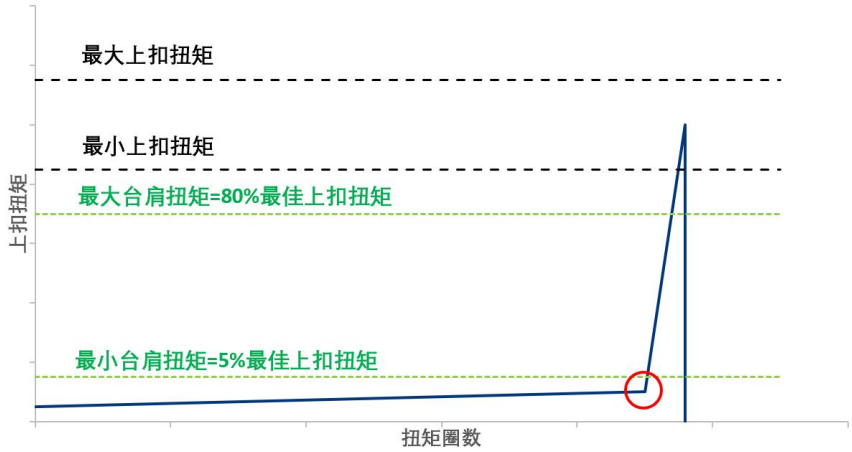
①The shoulder torque value is 5% ~ 80% of the make-up torque value;

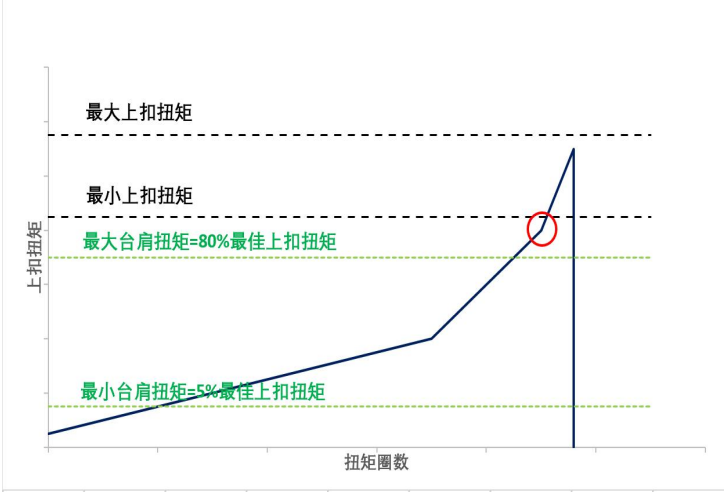
② The number of Delta turns should be ≤0.1 turns;

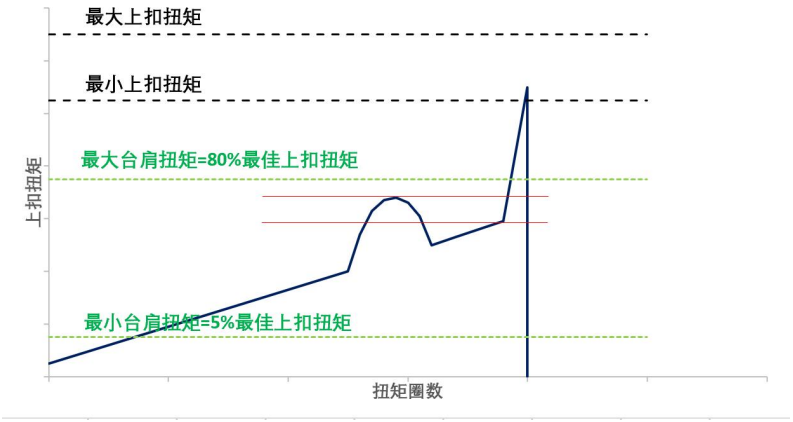
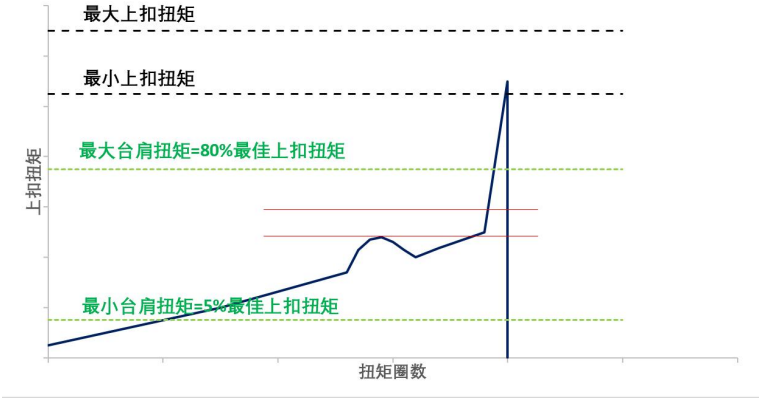
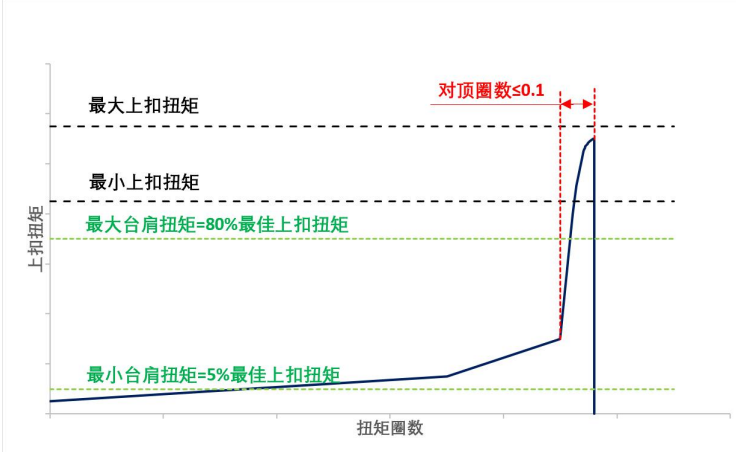
③The final torque value for make-up should be between the actual maximum torque value and the minimum torque value;

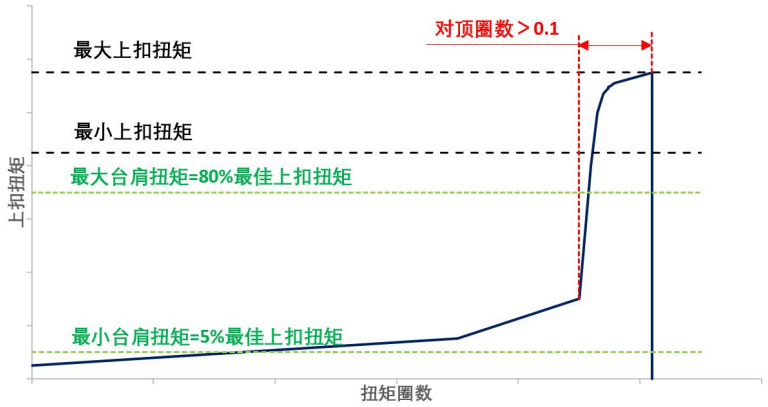
Minimum make-up torque not reached	Disposal method
	Check the make-up procedure and verify the operation method. After break-out, check the threads and sealing surfaces. If they are intact, re-make-up; if there are any damages, mark them and isolate

	them separately.

Inflection point torque is too low	**Disposal method**
	After break-out, mark and isolate individually.

Inflection point torque is too high	**Disposal method**
	After break-out, check the threads and sealing surfaces. If they are intact, re-make-up; if there are any damages, mark them and isolate them separately.

The torque in the fluctuation section is higher than the torque at the inflection point	**Disposal method**
	After break-out, check the threads and sealing surfaces. If they are intact, re-make-up; if there are any damages, mark them and isolate them separately.
The torque in the fluctuation section is lower than torque at the inflection point	**Disposal method**
	If there is a small fluctuation in the torque curve, but the maximum value of the fluctuation does not exceed torque at the inflection point, it is acceptable.
Confirm the opposite vertex turns	**Disposal method**
	If the number of opposite vertex turns is > 0.1, check the thread and sealing surface after break-out. If they are intact, re-make up; if there is any damage, mark it and isolate it separately.

Pin nose or shoulder yields	Disposal method
	After break-out, mark and isolate individually.

The curve slips during the make-up stage	Disposal method
	Small fluctuations occur in the make-up curve, which is acceptable as long as it does not affect the normal identification of the inflection point.