



**GUIDELINES**  
**FOR USE**

**RE PS**  
**02-048-2019**

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**USE OF**  
**TMK UP SIMPLEX THREAD CONNECTION FOR CASINGS**

**Revision 10**

## Introduction

The present guidelines are worked out taking into account the requirements of the following documents:

- API RP 5C1 Recommended Practice for Care and Use of Casing and Tubing;
- API RP 5B1 Gaging and Inspection of Casing, Tubing and Pipe Line Threads;
- ISO 10405 Petroleum and Natural Gas Industries – Care and Use of Casing and Tubing.
- TR CU 010/2011 – Technical Regulations of EAEC “On the Safety of Machinery and Equipment”.

### Information about the guidelines for use

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3 Revision 10. Effective date is July 28, 2022 with an option of early use.

4 For replacement of Revision 9 introduced into effect in April 25, 2022.

5 The present revision contains changes and additions in relation to the previous revision and amendments, which are highlighted in the text.

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## USE OF TMK UP SIMPLEX THREAD CONNECTION FOR CASINGS

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Effective date 28 – 07 – 2022

### 1 Scope

The present guidelines contain recommendations for maintenance and use of casing with TMK UP SIMPLEX thread connection under field conditions, including pipe preparation and make-up, string running and pulling operations, as well as guidelines for pipe handling, storage and inspection during operation.

### 2 Normative references

The present guidelines contain normative references to the following documents:

GOST R ISO 13678-2015 Casing, Tubing, Pipe Line and Elements of Drill Strings for Oil and Gas Industry; Evaluation and testing of thread compounds

GOST15150-69 Machines, Instruments and Other Industrial Products. Modifications for Different Climatic Regions. Categories, Operating, Storage and Transportation Conditions as to Environment Climatic Aspects Influence

API RP 5A3/ISO 13678 Recommended Practice on Thread Compounds for Casing, Tubing and Line Pipe

RD 39-7-904-83 Instruction on Material, Equipment and Spare Parts Storage in Warehouses on Facilities of Production and Technical Servicing and Completing, Enterprises and Entities of Ministry of Oil Industry

TU 0254-001-46977243-2002 RUSMA-1, RUSMA-1(3) Thread Compounds;

TU 0254-031-46977243-2004 RUSMA R-4, RUSMA R-4(3) Thread Compounds;

TU 19.20.29-223-46977243-2018 RUSMA API Modified 1000 Thread Compound

TU 0254-167-46977243-2015 RUSMA API Modified Thread Compound

TU 0254-158-46977243-2013 RUSMA Storage Compound.

TU 19.20.29-250-46977243-2018 RUSMA-M3 Compound.

**Note** - The specified document edition shall be applied for dated references taking into account all issued amendments. The valid revision shall be applied for undated references.

### 3 Terms and definitions

For the purposes of the present guidelines the standard terms as well as the following terms and definitions shall be applied:

3.1 **box (box connection):** The product with a thread connection on an inside surface.

3.2 **pin (pin connection):** The end of pipe with a thread connection on an outside surface.

3.3 **thread connection (make-up result):** Make-up of pin and coupling by means of thread.

3.4 **thread connection (structural element):** Thread, shoulder, other auxiliary elements of structure on pin or coupling.

3.5 **thread shoulder:** Pin shoulder, which serves as an arrester during make-up.

## **4 Transportation, handling operations and storage**

### **4.1 Transportation**

4.1.1 When pipes are transported by sea, railroad (rail cars) or trucks, Cargo Shipping Rules and Technical Provisions for Cargo Handling and Fastening applicable to the particular transport type shall be observed.

4.1.2 Pipe transportation, handling and storage shall be carried out with thread protectors screwed on pin and coupling end faces in order to protect thread surface, thread shoulders from exposure.

4.1.3 Pipe bundles of different lots and standard sizes can be loaded into same means of transportation, but have to be separated.

4.1.4 Pipe bundles shall be securely fastened during transportation to avoid any movement. Wooden blocks can be used for fastening purposes.

When several pipes bundles are stacked or not bundled pipes are stacked into several ranks, pipe bundles and pipe ranks shall be separated by at least three wooden blocks, with the thickness from **1.3780 to 1.5748 inch** each, so that weight of upper pipe ranks is not distributed onto couplings of lower ranks.

4.1.5 When transported by sea, pipe bundles shall not be placed in water inside the vessel's hold or in any other corrosive environment. Dragging of bundles along the piles or hitting bundles against hatches or rails is strictly forbidden.

4.1.6 When loading pipe bundles into railway cars or trucks, wooden girders (blocks) shall be provided for car floors or vehicle beds to ensure required distance between the products and uneven bottom of the vehicle. No blocks shall be placed under couplings.

4.1.7 In order to avoid hitting of pipes against vehicle metal elements or protruding parts of neighbouring pipe bundles, it is recommended to use load platforms with protecting covers.

## 4.2 Handling operations

4.2.1 All handling operations with pipes shall be carried out with thread protectors screwed on pin and coupling ends.

4.2.2 Handling operations with pipe bundles shall be carried out only with the help of hoisting transportation clamps.

In case of manual unloading, rope slings shall be used and pipes shall be rolled along guides in parallel to the pile, avoiding quick movement and collision of pipe ends.

When using the crane, spreader beams with slings shall be used according to approved slinging diagrams.

4.2.3 Pipes shall not be allowed to fall down from heights or be picked up by the pipe end with a hook or be dragged or subjected to any other actions that might damage pin and coupling threads, surfaces or shapes.

## 4.3 Stockholding and storage

4.3.1 Pipe storage conditions shall comply with GOST 15150 for Group 4 (long-term storage) or Group 8 (short-term storage up to three months and service interruptions).

4.3.2 Pipes, equipment and spare parts storage in warehouses on facilities of production and technical servicing and completing, enterprises and entities shall be according to RD 39-7-904-83.

### 4.3.3 Requirements for storage and stockholding of casings:

- pipes are not allowed to be stacked on the ground, rails, steel or concrete

foundations without wooden blocks;

- to exclude ingress of dust, moisture from the ground and foreign objects the first layer of pipes shall be located above the ground at the distance of not less than 13.7795 inch;

- the distance between the supports shall be such as to avoid sagging or thread damage.

Wooden blocks shall be located horizontally and in the same plane, and supports (racks) shall withstand the weight of all the pipe pile with wooden blocks without sagging. There shall be at least four supports either wooden or similar in properties to wooden blocks, with the height that provides that couplings do not touch each other.

- the height of bundled pipe piles including the use of wooden blocks shall not exceed 118.1102 inch;

- when stockholding unbundled pipes it is required to use piece by piece scheme of stacking. The ranks of pipes shall be divided by wooden blocks to exclude any load on couplings. It is required to use at least four wooden blocks. It is required to place wooden blocks at right angle to pipes and directly above the wooden blocks and supports of the previous ranks to avoid sagging. It is not allowed to locate wooden blocks under thread protectors;

- the pipes shall be equipped with the thread protectors during the whole period of storage as well as during handling operations;

- to ensure condensed water discharge from the pipe body and to exclude condensed water entering into coupling, stockholding of casings with a slope from 0.1969 to 0.2756 inch per 3.2808 ft. run towards pipe pin end is recommended.

4.3.4 Stockholding of unbundled pipes is allowed provided vertical posts are installed in the racks,

4.3.5 Stockholding of unbundled pipes is allowed provided vertical posts are installed in the racks.

4.3.6 If pipes are rolled on the racks, any movements at an angle to the rack axis shall be excluded as this may result in collision of pins and damage of thread connection or thread protectors.

4.3.7 During pipe storage, availability and integrity of thread protectors, as well as compound underneath and its expiration date shall be inspected. Pipe corrosion shall not be allowed.

4.3.8 During pipe storage for more than 6 months before use the compound under safety parts shall be renewed, except for the pipes with thread compound of longer period of storage.

For this purpose, the following actions shall be performed:

- unpack the package and roll the pipes;
- remove thread protectors according to para. 5.3;
- remove initial compound according to para. 5.4;
- apply storage compound (Kendex OCTG, BESTOLIFE Storage Compound (BSC), Total Jet Marine, RUSMA Storage Compound, RUSMA-M3 or thread compound with storage properties), with the expiration date of minimum 6 months – till the next compound renewal or pipe usage;
- install the thread protectors that were previously removed, make sure they are cleaned from old compound, or install new thread protectors according to para. 5.8.
- after completion of operation, package the pipes in compliance with packing list or store separately.

4.3.9 Pipes damaged during transportation, rejected during inspection, prepared for repair or awaiting a final decision shall be stored on separate racks with the corresponding information tags.

4.3.10 Drilling site shall have a special area for pipe stockholding in compliance with above-listed requirements.

4.3.11 Required quantity of racks shall be installed at drilling site in order to provide for stockholding of full set of pipes.

While stacking onto racks it is important to consider the order of string running (if it is specified in the work instruction), to exclude the risk of additional reassorting.

## **5 Preparation of pipes for make-up**

### **5.1 General**

Prior to lifting the pipes onto the rig site, proceed as follows:

- perform visual inspection of pipes and couplings;
- remove thread protectors from pipes and couplings;
- remove preservation compound from external and internal thread connections (in case of use of thread compound, removal is not required, see para. 5.4.4);
- inspect surfaces of external and internal thread connections;
- drift pipes along the entire length;
- measure the length of each pipe;
- re-install clean thread protectors on pins and couplings.

### **5.2 Visual inspection**

5.2.1 Visual inspection of pipes, couplings and thread protectors shall be performed in order to detect bent pipes, dents and damages.

5.2.2 Visual inspection of pipes and couplings shall be carried out with protectors screwed on.

5.2.3 Pipes and couplings connections, thread protectors with damages, discovered during visual inspection shall be put aside awaiting decision on their suitability for use.

Amount of damaged pipes shall be specified in the Product Quality Non-Conformity Protocol and all damaged areas shall be documented on photographs.

### **5.3 Thread protectors removal**

5.3.1 Thread protectors shall be removed after thread connections are visually inspected.

5.3.2 Thread protectors shall be removed manually or using a special tong with one person's effort. In case of difficulties when removing thread protectors, heating of thread



protectors with steam is allowed as well as striking slightly with a wooden hammer at a protector end to eliminate a possible distortion.

## 5.4 Compound removal

5.4.1 After removal of thread protectors, external and internal thread connections shall be cleaned from preservation compound by hot soapy water or with a steam cleaner. It is recommended to supply water under pressure. In case of freezing temperature, compound may be removed by using a solvent (Nefras, white spirit or similar). After compound is removed, thread connection shall be purged with compressed air or cleaned with dry rags.

***Compound shall not be removed using  
diesel, kerosene, salty water, barite or metal brushes!***

5.4.2 Barite or metal brushes can cause scratches on surfaces of sealing elements resulting in loss of tightness.

5.4.3 After compound is removed, thread connections shall be purged with compressed air or cleaned with dry rags.

5.4.4 When pipes are supplied with thread compound RUSMA-1 (3), RUSMA R-4 (3) under thread protectors, it is allowed to perform the first running and pulling operation with mill compound if mill thread protectors are screwed on and are not damaged. When thread protectors are screwed off, it is necessary to make sure that:

- the compound is free of foreign particles (if there are foreign particles, compound shall be removed according to 5.4.1, and reapplied according to 6.1);
- the compound is applied onto thread in an even layer (make the surface even and/or add the compound of the same type if necessary);
- the pipe was manufactured not more than 1 year ago according to the Certificate.

## 5.5 Thread connection inspection

5.5.1 Thread connection shall be inspected by the following specialists:

- crews for casing strings assembly;
- companies specialized in casing inspection.

When running casing for the first time, representatives of the casing supplier shall be present.

5.5.2 When inspecting pipe and coupling thread connections surfaces, make sure you pay due attention to the presence of:

- damages resulting from pipes collisions or other impacts;
- damages resulting from installation of thread protectors;
- rust, corrosion or other chemical damages caused as a result of environmental exposure or due to aggressive agents.

5.5.3 Under low light condition (twilight, night) individual portable light sources shall be used during inspection.

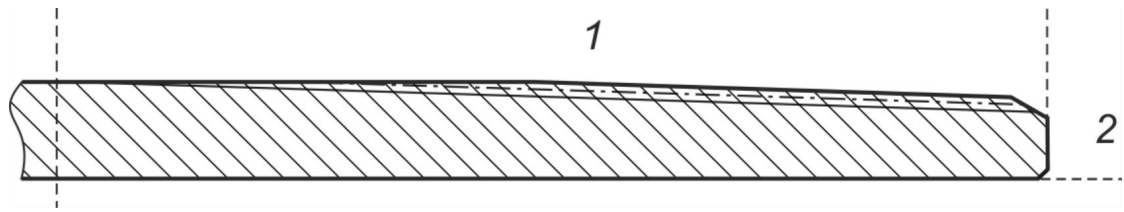
5.5.4 Possible damages that might occur on thread connections surface before pipe and coupling putting into operation and the ways of the damages elimination are listed in Table 1 for defined areas of thread connections, indicated in Figure 1.

5.5.5 Determination of corrosion depth and defects is recommended to perform using:

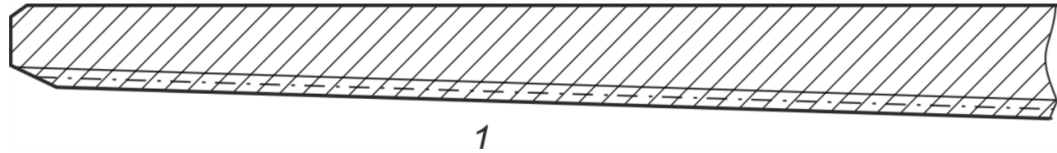
- a mold taken from a detected defect using a special tape (X Coarse material of Testex company for defects up to 0.0039 inch deep, for deeper defects: X-Coarse Plus or equivalent one). Mould height shall be measured with a thickness gage, measurement accuracy shall be at least 0.0004 inch (PEACOCK G2-127 gage or equivalent one);
- depth gage with a needle-type contact point (contact point diameter shall be maximum 0.0039 inch), measurement accuracy shall be at least 0.0004 inch (PEACOCK T-4 gage or equivalent one).

**Table 1 – Types of damages and methods of repair before putting into operation**

Surface area (Figure 1)	Type of damage	Damage repair method
1	Surface corrosion (rust), pit corrosion not more than 0.0039 inch depth	Manual repair (removal) using non-metal brush with soft bristle or polishing paper with grain 0
	Pit corrosion more than 0.0039 inch deep	not to be repaired
	Dents, nicks, grooves and other defects with the depth of not more than 0.0039 inch	Manual repair using needle file or polishing paper with grain 0
	Dents, nicks, grooves and other defects with the depth of more than 0.0039 inch	not to be repaired
2	Pit corrosion of any depth	not to be repaired
	Surface corrosion (rust), removed by buffing	Repair by buffing
	Grooves removed by buffing	Repair by buffing
	Dents, nicks and other defects of any depth	not to be repaired



a) – Surface of external thread connection



b) – Surface of internal thread connection

1 - thread (machined surface only); 2 - thread shoulder

**Figure 1**

5.5.6 If any unacceptable damages are detected on pipes, pipes shall be rejected then and reported accordingly specifying pipes serial numbers, describing damages found with photos attached.

**5.6 Drifting**

5.6.1 Drifting shall be performed using a mandrel along the entire length of pipes.

5.6.2 Before drifting, the pipe shall be positioned in such a manner as to avoid sagging. If any ropes or bars are used for the drifting process, they shall be clean. In case of freezing temperatures, pipes shall be heated prior to drifting to remove snow and ice crust.

5.6.3 Pipe and drift shall be of the same temperature during drifting process.

5.6.4 Dimensions of the drift effective part shall comply with those specified, in Table 2.

5.6.5 The mandrel shall pass through the entire pipe, when pulled manually without significant effort.

5.6.6 Pipes rejected during drifting process, shall be put aside until further decision on their validity and recorded in product quality non-compliance report.

**Table 2 – Dimensions of the effective part of the mandrel**

In inches		
Pipe outside diameter	Length of the effective part of the mandrel	Diameter of the effective part of the mandrel
From 4 1/2 to 8 5/8 incl.	5.9843	$d - 0.1252$
from 9 5/8 to 13 3/8 incl.	12.0079	$d - 0.1563$
N o t e s: <i>d</i> is a pipe inside diameter.		

## 5.7 Measurement of length of pipes

5.7.1 Length of each pipe shall be measured from free (without a thread protector) coupling end face to free (without a thread protector) pin end face.

It is recommended to compare measured pipe length with the marked length. In case of discrepancies the measured length shall be marked on the pipe body with a marker or a chalk.

5.7.2 When calculating the total length of the string, one should use the formula specified below

$$L = \sum L_{\phi} - n \Delta L \quad (1)$$

where  $L$  – the total length of the string;

$\sum L_{\phi}$  – the overall length of pipes in a string, measured from pin end face to free coupling end face;

$n$  – number of pipes in a string;

$\Delta L$  – decrease of pipes length during make-up according to Table 3.

## 5.8 Thread protectors installation

5.8.1 After inspection and control, thread protectors or caps shall be re-installed on pin and coupling ends.

5.8.2 Before installation thread protectors shall be thoroughly cleaned and shall have no significant damages affecting protection of thread and seal against direct contact with exposure.

**Table 3 – Decrease of pipe length during make-up process**

Pipe outside diameter	Inches	
	Decrease of pipe length during make-up $\Delta L$	
4 1/2	3.9370	
5	4.0630	
5 1/2	4.1260	
5 3/4	4.1890	
6 5/8	4.3110	
7	4.5000	
9 5/8	4.8110	
10 3/4	4.8110	
11 3/4	4.8110	
12 3/4	4.8110	
13 3/8	4.8110	

## 6 Make-up of pipes

### 6.1 Application of thread compound

6.1.1 To ensure optimum conditions for make-up and to avoid burrs of mating surfaces, all surfaces of thread and thread shoulders of pins shall be provided with thread compound.

The following types of thread compound are recommended:

- RUSMA-1 and its modifications;
- RUSMA R-4 and its modifications;
- RUSMA API Modified 1000;
- RUSMA API Modified;
- Bestolife API Modified;
- Bestolife 72733;
- Bestolife 2000;
- Bestolife API Modified HP/HT;
- Bestolife 2000 NM;
- JET-LUBE API Modified.

By agreement with the developer of the connection, other thread compounds that meet requirements of API RP 5A3/ISO 13678 and GOST R ISO 13678 are allowed.

6.1.2 Thread compound for make-up shall only be taken from original packages, delivered by the supplier, the container shall show name, batch number and manufacturing date.

***Compound from packages without proper identification, shall never be used.***

***Compound shall never be placed in other packages or dissolved!***

Compound applied shall be homogeneous, of ointment consistency, free from any solid inclusions (stones, sand, dry compound, fine chips, etc.).

Prior to use, check compound's expiration date on the package.

***Never apply compound with expired shelf life.***

6.1.3 Make sure you follow the recommendations specified below when using thread compound:

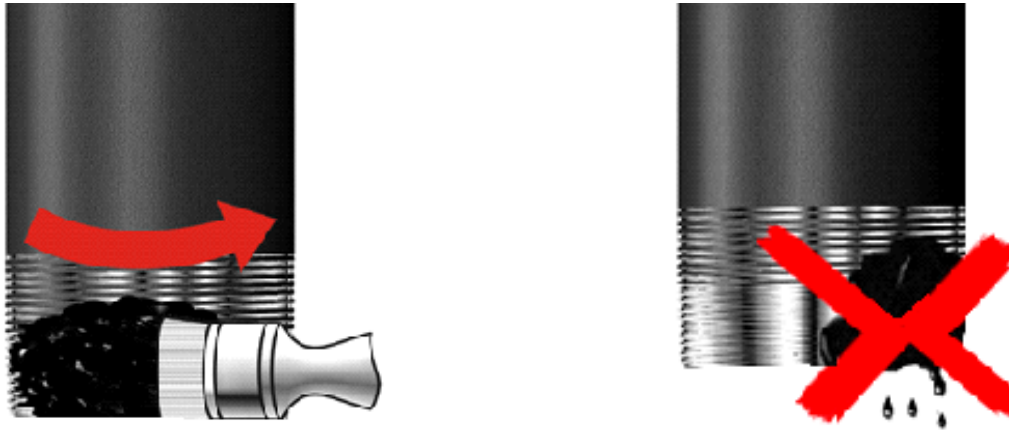
- use the same compound (the same type) when assembling one casing string;
- use a new compound package for each running, if the compound from opened package is used, make sure it is free from foreign inclusions;
- stir the compound thoroughly before use;
- warm up the compound before application in case of freezing temperatures.

Compound shall be stored in closed overturned packages at the temperature specified by the manufacturer. When storing partially unused compound, always specify the date of the first use on the package.

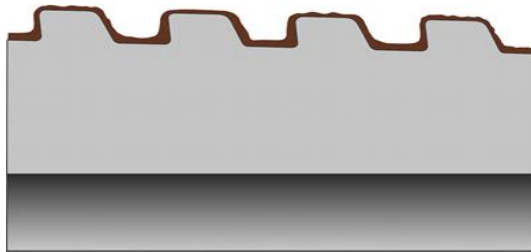
6.1.4 Thread compound shall be applied with an even and continuous layer on the whole thread surface and thread shoulders of pipe connections. Figures 2 and 3 demonstrate proper and unacceptable application of thread compound.

Before application of thread compound, thread connection surface shall be thoroughly cleaned and dried.

**Never use metal brushes for compound application!**



**Figure 2**



**Figure 3**

6.1.5 Required amount of thread compound shall be distributed between coupling and pin end as follows: two thirds shall be on the coupling end and one third shall be on the pin end.

The minimum and the maximum compound mass  $m_{\min}$  and  $m_{\max}$  in gr for make-up of one thread connection shall be calculated as follows:

$$m_{\min} = 0.25 D \quad (2)$$

$$m_{\max} = 0.30 D \quad (3)$$

where  $m_{\min}$  is the minimum compound mass in gr rounded to an integral value;

$m_{\max}$  is the maximum compound mass in gr rounded to an integral value;

$D$  is the outside diameter of pipes, in mm, rounded to an integral value.

**Example - The minimum quantity of thread compound required for make-up of one thread connection of a coupling and pipe with the outside diameter of 177.8 mm (7 inch):**  
 $m_{\min} = 0.25 \times 177.8 \approx 45 \text{ gram (1.59 oz)}$  with at least 30 grams (1.06 oz) per coupling and at least 15 grams (0.53oz) per pin.

Note - Calculated compound mass is theoretical.

6.1.6 To determine the quantity of compound required for determined number of pipes, a package of compound with specified volume shall be used.

Prior to pipes running down the hole, make sure that required thread compound of one type is available.

6.1.7 Thread sealant can be used for make-up of pipes with crossovers or other string elements provided the below conditions are followed.

## 6.2 Running and pulling

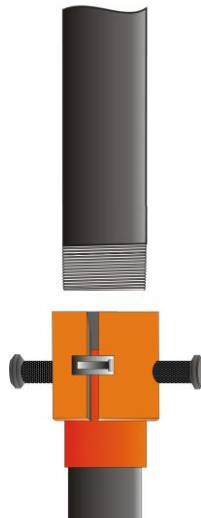
6.2.1 Casing shall be assembled by a qualified operator. thread connection make-up shall be inspected by one of the below listed methods:

- tracking and registering of make-up torques;
- taking down the readings of manometer of breakout tong (conversion of pressure into torque shall be in compliance with the tong manufacturer recommendations);
- fix the position of the make-up triangle (cross stripe).

6.2.2 A special stab guide or bell guide is recommended for running and pulling operations (Figure 4). This device helps to align pin and coupling and prevent the connection from damage.

6.2.3 In order to decrease the risk of new damages during running and pulling operations, it is recommended to use pipe weight balancer.

In case of non-operating state of pipe weight balancer or its absence, a driller shall control constant weight on hook (within limits  $\pm 100$  kg ( $\pm 220.46$  lb)) taking into consideration pipe weight.



**Figure 4**

6.2.5 Rotary tong or casing make-up system shall be equipped with a speed governor and shall ensure:

-- at the initial stage - speed of make-up of not more than 1-2 rpm for safe entering of external thread into internal thread (reverse is allowed).

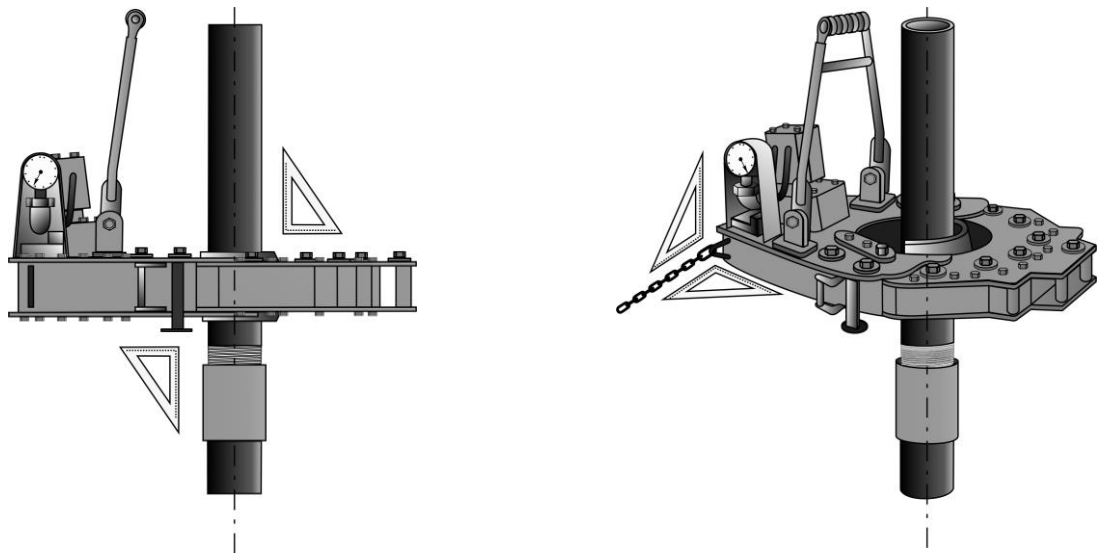
- at the stage of the main make-up - smooth rotation of a pipe at the speed of not more than 10 rpm;

- at the final stage - make-up speed of not more that 1-2 rpm and smooth rotation of a pipe without jerks and stops.

If break-out of thread connection according to para. 6.5 and casing make-up system use are required, rotary tongs shall be provided.

Rotary tongs shall be equipped with clamps for pipe sizes used to ensure a sufficient surface area contacting with the pipe body. Clamps diameter shall be 1 % greater than pipe nominal outside diameter. Clamps shall be adjusted in such a way that they hold the pipe tightly and never slip.

Prior to make-up, tongs shall be positioned as per Figure 5.



**Figure 5**

6.2.5 Make-up equipment shall ensure torque at least 30 % greater than recommended maximum make-up torque.

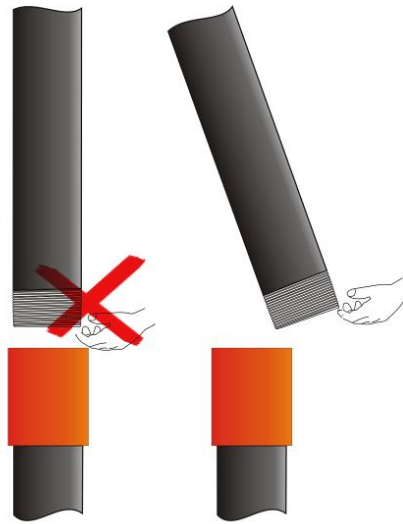
### **6.3 Assembly of string**

6.3.1 Make sure thread protectors are secured in place prior to lifting pipes onto the rig floor.

***Lifting pipes to the rig floor without thread protectors or end caps (clepo) is not allowed!***

6.3.2 Prior to assembly of the string, remove thread protectors or end caps (clepo) and check surfaces of thread, thread shoulders of the free pipe end for any mechanical damage according to Figure 6.





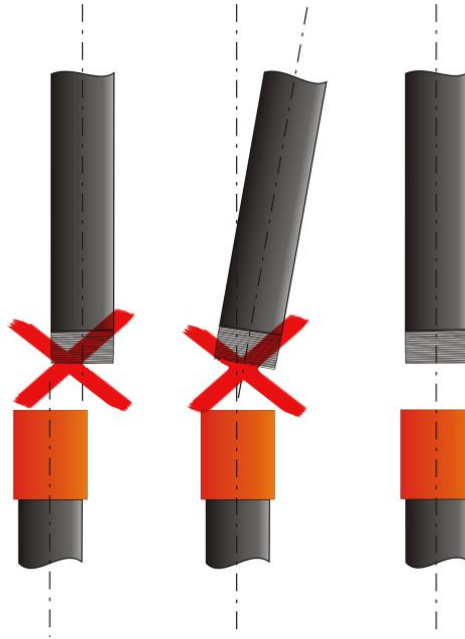
**Figure 6**

6.3.3 During make-up process, if a derrick man is absent, it is required to control alignment of upper pipe coupling end (decline) with lower pipe rotation axis and correct the situation timely by directing a driller accordingly (top drive turn, elevator movements up and down, etc.). (Figure 7).

***Maximum misalignment of connected pipes shall not exceed 0.7874 inch.***

6.3.4 Compound shall be applied according to para. 6.1. It is recommended to perform air blasting of external and internal threads prior to compound application.

6.3.5 Make sure prior to make-up, that surfaces of thread and thread shoulders with applied compound are free from mud or mud laden fluid with small contaminations, hindering tightness of connection. In case of mud or mud laden fluid on connection surfaces, clean them and apply thread compound again.



**Figure 7**

6.3.6 When stabbing a pin into a coupling, pin end face shall not hit coupling end face, pin sliding down into the coupling is not allowed.

6.3.7 The make-up torque for a thread connection shall be within the range from the minimum up to the maximum torques for the corresponding sizes and grades specified in Table 4.

6.3.8 During make up of pins and couplings made of steels of different grades, the make-up torque value shall be chosen according to the lowest steel grade of both pin and coupling.

6.3.9 Make-up of thread connection shall be performed till pin shouldering. The factor which shows shouldering of end-faces is a sharp increase of make-up torque or pressure readings on manometer of the rotary tong.

**Table 4 – Make-up torques**

D, Inch	S, Inch	Torque, ft lb for steel grades																											
		J55, K55			N80, L80			C90			R95, T95			C110, P110			Q125			Q135			TMK140			TMK150			
		M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	
4 1/2	0.2500	3200	4300	4700	3500	5300	5800	3600	5600	6200	3700	5800	6400	3800	6600	7200	4000	7300	8000	4100	7600	8300	4100	7800	8600	4200	8100	8900	
	0.2902	3500	4600	5000	3900	5800	6400	4100	6300	7000	4100	6600	7200	4300	7400	8100	4400	8100	8900	4600	8600	9500	4600	8800	9700	4800	9200	10200	
	0.3370	3700	5200	5800	4500	6600	7300	4600	7200	8000	4700	7500	8300	4900	8300	9100	5000	9200	10200	5200	9800	10800	5200	10100	11100	5400	10600	11700	
5	0.2531	3500	4800	5300	3800	6600	7200	4000	7200	7900	4100	7700	8400	4200	8600	9500	4400	9700	10700	4500	10300	11400	4600	10800	11900	4700	11400	12600	
	0.2961	4100	5400	5900	4500	7300	8000	4600	8000	8800	4700	8500	9400	4900	9600	10500	5000	10800	11900	5200	11400	12600	5200	11900	13100	5400	12600	13900	
	0.3618	4400	6300	7000	4800	8500	9400	4900	9400	10300	5000	9700	10700	5200	11100	12200	5300	12300	13600	5500	13100	14500	5500	13500	14800	5700	14400	15900	
	0.4370	5500	7400	8200	5900	9800	10800	6000	10900	12000	6100	11100	12200	6300	12800	14000	6400	14100	15500	6600	15100	16700	6600	15400	17000	6800	16400	18100	
	0.4780	6100	8000	8800	6500	10500	11600	6600	11700	12900	6700	11900	13100	6900	13600	15000	7000	15000	16500	7200	16200	17800	7200	16400	18000	7400	17600	19300	
	0.5000	6400	8300	9100	6800	11000	12100	6900	12200	13400	7000	12400	13600	7200	14200	15600	7300	15600	17100	7400	16700	18400	7500	17000	18700	7700	18100	20000	
5 1/2	0.2748	4000	5500	6100	4400	7600	8300	4600	8500	9400	4600	8800	9700	4800	10100	11100	4900	11400	12500	5100	12200	13500	5200	12600	13900	5300	13500	14800	
	0.3039	4300	6300	7000	4700	8500	9400	4900	9400	10300	4900	9700	10700	5100	11000	12100	5200	12300	13600	5400	13200	14500	5500	13600	14900	5600	14500	15900	
	0.3610	4800	7900	8700	5200	10100	11100	5400	11000	12100	5500	11500	12700	5600	12800	14100	5800	14200	15600	5900	15000	16500	6000	15500	17000	6100	16400	18000	
	0.4150	5300	9400	10300	5800	11700	12900	5900	12600	13900	6000	13100	14500	6100	14500	16000	6300	15900	17600	6400	16800	18500	6500	17300	19100	6600	18200	20100	
5 3/4	0.2756	4100	6000	6600	4500	8200	9000	4600	9100	10000	4700	9500	10500	4900	10800	11900	5000	12200	13400	5200	13100	14400	5200	13500	14800	5400	14400	15900	
	0.3031	4400	6800	7400	4800	9100	10000	4900	10000	11000	5000	10400	11400	5200	11700	12900	5300	13100	14400	5500	13900	15300	5500	14400	15900	5700	15300	16800	
	0.3346	4700	7700	8600	5200	10000	11100	5300	10900	12000	5400	11400	12500	5500	12800	14000	5700	14100	15500	5800	15000	16400	5900	15400	17000	6000	16300	17900	
	0.3740	5200	8900	9800	5600	11300	12400	5800	12200	13400	5800	12600	13900	6000	14000	15400	6100	15300	16900	6300	16200	17800	6300	16700	18400	6500	17600	19300	
	0.4213	5800	10300	11400	6200	12800	14000	6300	13600	15000	6400	14100	15500	6600	15600	17100	6700	16900	18600	6900	17800	19500	6900	18200	20100	7100	19100	21000	
6 5/8	0.2882	4800	9100	10000	5300	10900	12000	5500	11700	12800	5500	12000	13200	5800	13100	14400	6000	14200	15600	6100	15000	16400	6200	15300	16900	6300	16200	17800	
	0.3150	5200	9800	10800	5700	11600	12800	5800	12300	13600	5900	12700	13900	6100	13700	15100	6300	14800	16300	6500	15500	17100	6600	15900	17500	6700	16700	18400	
	0.3520	5700	10800	11900	6300	12500	13800	6400	13200	14500	6600	13600	14900	6800	14600	16100	7000	15600	17200	7200	16300	17900	7300	16700	18400	7400	17300	19100	
	0.4169	6600	12700	13900	7200	14200	15600	7400	14700	16200	7500	15100	16700	7800	16200	17800	8100	17000	18700	8300	17600	19400	8400	18000	19800	8600	18500	20400	
	0.4748	7400	14200	15600	8000	15700	17300	8200	16200	17800	8300	16500	18100	8600	17600	19300	8900	18400	20200	9100	18800	20700	9300	19200	21100	9500	19600	21600	
7	0.3169	5500	10800	11900	6000	12800	14000	6100	13500	14800	6300	13900	15300	6600	15000	16500	6900	16200	17800	7000	17000	18700	7200	17400	19200	7300	18100	20000	
	0.3618	6100	12900	14200	6700	14700	16200	6900	15400	17000	7000	15800	17300	7200	16900	18600	7400	18000	19800	7700	18700	20500	7700	19100	21000	8000	19800	21800	
	0.4079	6800	15000	16400	7400	16700	18400	7700	17300	19100	7700	17700	19500	8000	18700	20600	8300	19800	21800	8600	20400	22500	8700	20800	22900	9000	21500	23600	
	0.4531	7400	17000	18700	8000	18600	20400	8300	19200	21200	8400	19500	21500	8700	20600	22600	9000	21500	23700	9300	22200	24400	9400	22500	24800	9700	23200	25400	
	0.4980	8100	19100	21000	8700	20600	22600	9000	21200	23300	9100	21500	23600	9400	22400	24600	9700	23300	25700	10000	23900	26300	10000	24200	26600	10300	24800	27300	
	0.5402	8800	20900	23000	9400	22300	24600	9700	22900	25200	9700	23200	25400	10000	24100	26500	10300	24900	27400	10600	25500	28100	10700	25700	28300	11000	26300	29000	

End of Table 4

D, Inch	S, Inch	Torque, ft lb for steel grades																											
		J55, K55			N80, L80			C90			R95, T95			C110, P110			Q125			Q135			TMK140			TMK150			
		M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	M <sub>min</sub>	M <sub>opt</sub>	M <sub>max</sub>	
7 5/8	0.3280	6400	13300	14600	6800	14700	16200	6900	15300	16800	7000	15500	17000	7200	16400	18000	7400	17200	18900	7600	17800	19500	7700	18000	19800	7800	18600	20400	
	0.3748	7900	15300	16800	8300	16500	18100	8400	17100	18800	8500	17300	19000	8800	18100	19900	9100	18800	20700	9200	19300	21200	9300	19500	21500	9400	20100	22100	
	0.4299	8700	17600	19400	9100	18700	20600	9400	19200	21100	9400	19400	21300	9700	20100	22100	10000	20600	22700	10300	21200	23300	10300	21300	23500	10500	21800	24000	
	0.5000	9800	20600	22700	10300	21500	23700	10500	21900	24100	10600	22100	24300	10900	22600	24900	11200	23100	25400	11400	23500	25800	11600	23600	26000	11800	24000	26400	
9 5/8	0.3118	6800	17400	19200	7200	17700	19500	7400	17800	19600	7500	17900	19700	7700	18100	19900	8000	18200	20100	8200	18400	20200	8300	18400	20300	8500	18600	20400	
	0.3520	7500	18800	20700	8000	19200	21200	8200	19400	21300	8300	19500	21400	8500	19800	21800	8700	20000	22000	8900	20100	22100	9000	20200	22200	9200	20400	22400	
	0.3949	8300	21100	23200	8800	21400	23500	9000	21500	23700	9100	21500	23700	9300	21800	24000	9500	21900	24100	9700	22100	24300	9800	22100	24300	10000	22200	24400	
	0.4350	8900	22900	25100	9400	23200	25400	9600	23300	25700	9700	23300	25700	10000	23500	25900	10200	23700	26000	10400	23800	26200	10500	23800	26200	10700	24000	26400	
	0.4720	9100	24500	26900	9500	24800	27300	9700	24900	27400	9800	24900	27400	10100	25100	27700	10400	25300	27800	10600	25400	28000	10700	25400	28000	10900	25600	28200	
	0.5449	9400	27700	30500	9800	28000	30800	10000	28200	31000	10100	28200	31000	10400	28400	31300	10700	28500	31400	10900	28700	31600	11000	28700	31600	11200	28800	31700	
10 3/4	0.3500	6900	19500	21400	7400	19800	21800	7500	19900	21900	7600	20000	22000	7800	20100	22100	8000	20400	22400	8200	20500	22600	8300	20600	22600	8400	20700	22800	
	0.4000	7400	21800	24000	7900	21900	24100	8000	22100	24300	8100	22100	24300	8300	22100	24300	8600	22300	24500	8700	22700	25000	8800	22800	25100	8900	22900	25200	
	0.4500	8300	24000	26500	8800	24200	26600	8900	24300	26800	9000	24300	26800	9200	24400	26800	9400	24600	27000	9600	24900	27400	9700	24900	27400	9800	25100	27600	
	0.4949	8800	26100	28700	9200	26300	28900	9400	26400	29100	9600	26400	29100	9900	26500	29100	10200	26600	29300	10400	26800	29500	10500	26900	29600	10800	27100	29800	
	0.5449	9100	28400	31300	9500	28500	31400	9700	28700	31600	9900	28700	31600	10100	28800	31600	10300	28900	31800	10500	29100	31900	10700	29100	32100	10900	29300	32200	
298.45	0.3748	7900	19800	21800	8300	20600	22700	8600	20700	22800	8800	20900	23000	9200	21100	23200	9400	21300	23500	9600	21400	23500	9600	21500	23700	9800	21800	24000	
	0.4350	8300	22900	25100	8800	22900	25200	9000	23000	25300	9200	23200	25500	9400	23300	25600	9700	23500	25800	9800	23500	25900	9800	23600	26000	10000	23700	26100	
	0.4890	8600	26300	28900	9000	26300	29000	9200	26400	29000	9400	26400	29100	9600	26400	29100	9800	26500	29100	10000	26500	29100	10000	26500	29200	10300	26500	29200	
12 3/4	0.3346	7400	19500	21500	7700	19700	21700	7900	19700	21700	8000	19800	21800	8300	19800	21800	8600	19900	21900	8700	19900	21900	8800	19900	21900	8900	20100	22100	
	0.3740	7600	21300	23500	8000	21400	23500	8100	21400	23500	8200	21500	23600	8500	21500	23600	8800	21500	23700	8900	21600	23700	9000	21600	23700	9100	21800	24000	
	0.4331	8000	24000	26400	8400	24000	26400	8600	24000	26400	8700	24000	26400	9100	24000	26400	9400	24000	26400	9700	24200	26600	9700	24200	26600	10000	24300	26700	
	0.4882	8300	26500	29100	8800	26500	29100	9000	26500	29100	9100	26500	29100	9400	26500	29100	9800	26500	29100	10000	26500	29200	10100	26500	29200	10300	26600	29300	
	0.5512	8800	29300	32200	9200	29300	32200	9400	29300	32200	9500	29300	32200	9900	29300	32200	10300	29300	32200	10500	29300	32200	10500	29300	32200	10800	29300	32200	
13 3/8	0.3799	8000	22300	24600	8300	22400	24600	8500	22400	24600	8600	22500	24800	8800	22500	24800	9100	22600	24900	9300	22600	24900	9400	22600	24900	9500	22600	24900	
	0.4299	8300	25100	27700	8800	25100	27700	9000	25100	27700	9100	25100	27700	9400	25100	27700	9800	25100	27700	10000	25300	27800	10100	25300	27800	10300	25300	27800	
	0.4799	8500	27900	30800	8900	27900	30800	9100	27900	30800	9200	27900	30800	9600	27900	30800	10000	27900	30800	10200	28000	30800	10300	28000	30800	10500	28000	30800	
	0.5142	9000	29900	32900	9400	29900	32900	9700	29900	32900	9800	29900	32900	10100	29900	32900	10400	29900	32900	10600	29900	32900	10800	29900	32900	11000	29900	32900	

Notes:

1. The grades specified without types, include all the types.
2. When making-up pipes with the grades not specified in present Table, refer to the torques provided in regulatory documentation for these pipes

6.3.10 At the initial stage of assembling it is recommended to perform the first two revolutions of pipe using strap tongs (chain tongs are allowed for use only with the safe gasket which is set between the pipe body and the tong thus avoiding pipe body damage) to assure connection of external and internal threads, i.e. entering of external thread profile in mating profile of internal thread.

At this stage pipe reversal half-revolution is allowed for steady continuation of make-up without threads overlapping and high-quality assembly.

6.3.11 Make-up rotation speed during connection make-up with the rotary tong shall correspond to the values specified in Table 5.

**Table 5 – Rotation speed during make-up**

Start of make-up		End of make-up
First two turns	Further turns	
Speed maximum 5 rpm, Better manually	Speed maximum 15 rpm	Speed maximum 5 rpm

6.3.12 Even longitudinal movement of the pipe resulting from gradual increase of number of engaged revolutions shall be watched, significant warming of the connection (not more than 122 °F of the ambient temperature) shall not be allowed.

6.3.13 Make-up shall not cause significant mechanical damages like galling, jamming or other imperfections on pipe and coupling body.

The outer surface of coupling shall be free of damages with the depth larger than 0,5% of the coupling nominal outside diameter.

Damages from tong clamps are allowed on the pipe outer surface provided that the actual pipe wall thickness, taking into account depth of the damage, shall be not less than 87.5% of the nominal pipe wall thickness.

6.3.15 When using hydrotongs with back up, the following conditions shall be observed:

During the first rotations (better manually, using a chain tong), back up shall be opened, and make-up shall be performed without make-up torque increase. At that it is possible to make horizontal movements of hydrotong (right/left) to prevent thread bite during make-up.

Upon increase of make-up torque (on the last 3 turns), it is required to stop, fix the back up on lower pipe body (back-up installation on coupling is not allowed) and continue make-up.

If for make-up of thread connection hydrotong is used not equipped with back up which serves as an arrester it is required to use a mechanical universal tong with a fixing function on lower pipe body.

6.3.16 Turning of coupling from the side of mill connection is allowed, the value of turning shall not exceed  $\frac{1}{2}$  of rotation. If turning of coupling exceeds the specified value, it is necessary to fix the coupling using manual tong and continue make-up.

6.3.17 When mud fluid is added into the string, to avoid mud fluid on thread and pin thread shoulder, thread protectors need to be used, Figure 8a, it is allowed to use thread protectors machined (with thread removed), Figure 8b

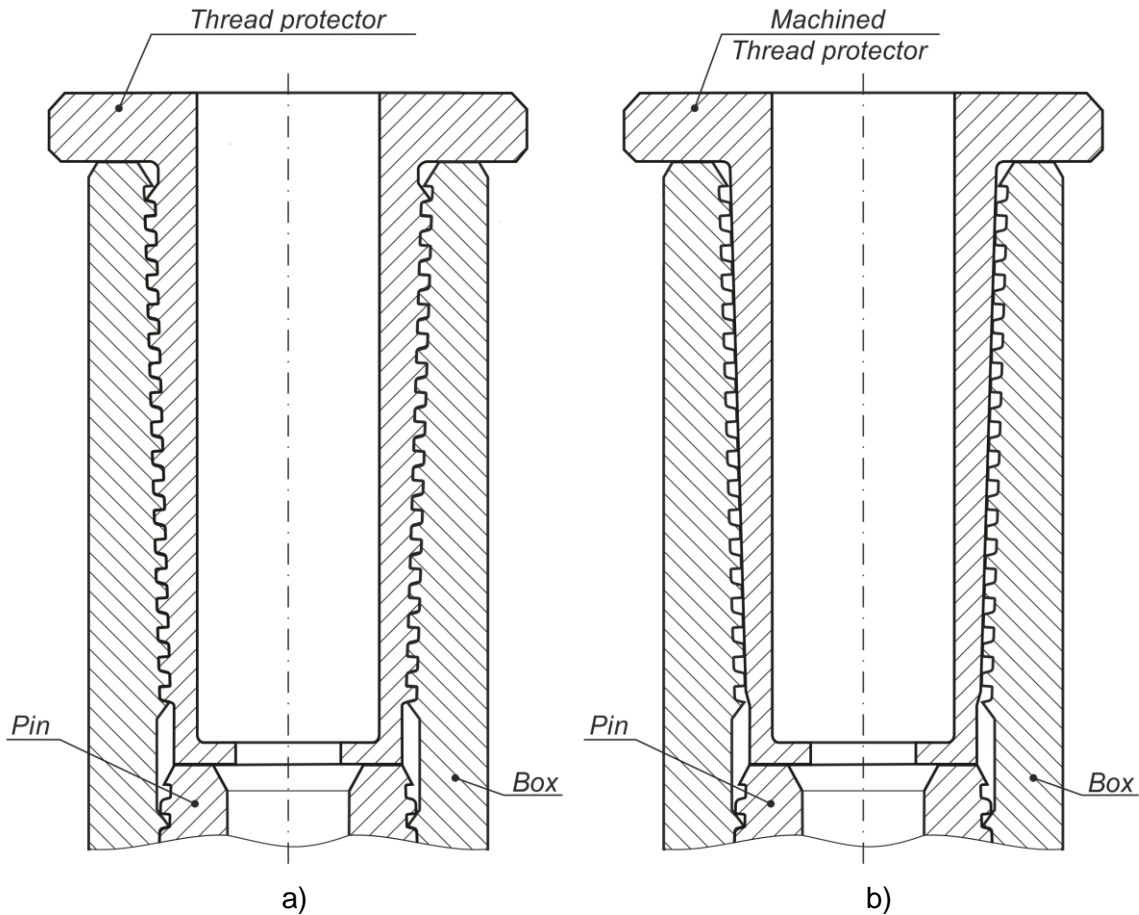


Figure 8

#### 6.4 Make-up inspection by make-up triangle marking (transverse stripe)

6.4.1 Correct make-up is proved by alignment of coupling end face with the base of make-up triangle (transverse stripe near edge) with the deviation of not more than  $\pm 0.0984$  inch (Figure 9).

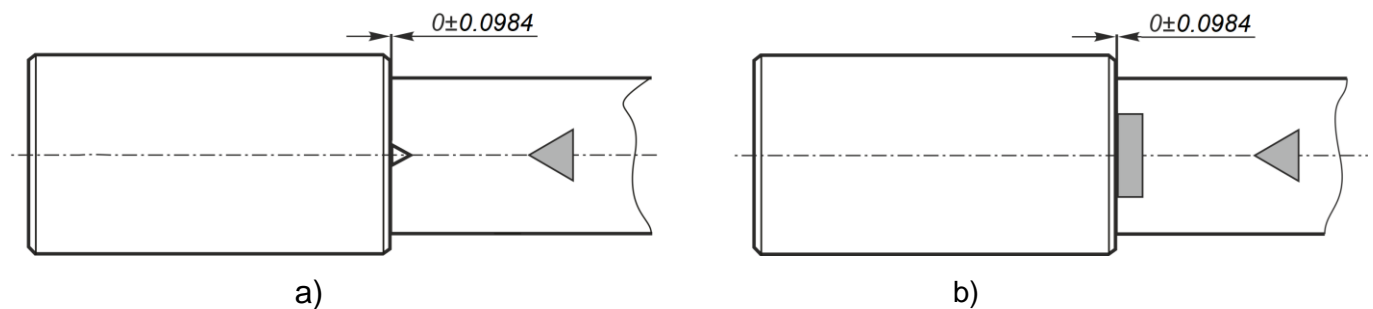


Figure 9

6.4.2 The key factor of inspection of end faces shouldering is a sharp increase of make-up torque or manometer readings. The torque value shall be within the range from minimum up to maximum value.

6.4.3 If given make-up torque value is reached, coupling end face has not aligned with the base of make-up triangle (transverse stripe near edge) on the pin taking into account an allowable deviation, such a connection needs be broken-out, visually inspected and the distance from coupling end face to made-up pin end face of the mill connection needs to be controlled. Allowable distance is  $\frac{1}{2}$  of coupling length  $\pm 0.0984$  inch. If there is a deviation of the specified parameter, the pipe and coupling shall be rejected. If the measured parameter has a satisfactory value, it is necessary to clean the connection from compound, visually inspect, eliminate the detected damages if required (para 5.5.7), apply thread compound of the requisite type and quality and repeat make-up. If non-allowable damages are detected, the connection shall be rejected.

6.4.4 If given make-up torque value is reached, coupling end face has aligned with the base of make-up triangle (transverse stripe) on the pin taking into account an allowable deviation, but there was not a sharp increase of make-up torque value, such a connection is accepted and is considered allowable.

## 6.5 Break-out of string

6.5.1 Prior to break-out, the rotary tongs shall be positioned as per Figure 5.

6.5.2 Prior to start break-out of connection hydro tong back-up shall be fixed on lower pipe body of a broken-out connection. If for break-out of connection hydro tong is used not equipped with back up or casing make-up system which serves as an arrester it is required to use a mechanical universal tong with a fixing function on coupling of lower pipe of a broken-out thread connection (fixing of back up on lower pipe body is not allowed, to exclude break-out of the mill connection).

6.5.3 When the string is being pulled out of the well, pin end faces are not allowed to hit against coupling end faces.

6.5.4 Even longitudinal movement of the pipe resulted from gradual increase of number of engaged turns, shall be watched when the connection is broken-out.

A driller fixes the weight on a hook load free, provides tension within  $220.5\div 330.7$  lbs, and tries to maintain these values in the process of breaking-out. On the last turn pipe moving up shall be stopped in order to fix thread run-out (a click) and after that the pin shall be moved out of the coupling.

6.5.5 Break-out torque shall provide for the connection disassembly.

Reduce of thread connection break-out torque by 20% relative to the recommended optimum make-up torque  $M_{opt}$  is allowed.

6.5.6 Speed of connection break-out by rotary tong shall correspond to the speed, specified in Table 6.

**Table 6 – Speed of thread connection break-out**

Start of break-out		End of break-out
First two turns	Further turns	
Speed maximum 5 rpm,	Speed maximum 15 rpm	Speed maximum 5 rpm

6.5.7 Break-out shall not cause significant mechanical damages like galling, jamming or other imperfections on pipe and coupling body.

The outer surface of couplings shall be free of damages with the depth larger than 0,5% of the couplings nominal outside diameter.

Damages from tong clamps are allowed on the pipe outer surface provided that the actual pipe wall thickness, taking into account depth of the damage, shall be not less than 87,5% of the nominal pipe wall thickness.

6.5.8 When the string is disassembled, immediately after break-out thread protectors shall be installed on pin and coupling ends.

6.5.9 To store used pipes after string disassembly, if necessary, the following preparations shall be carried out:

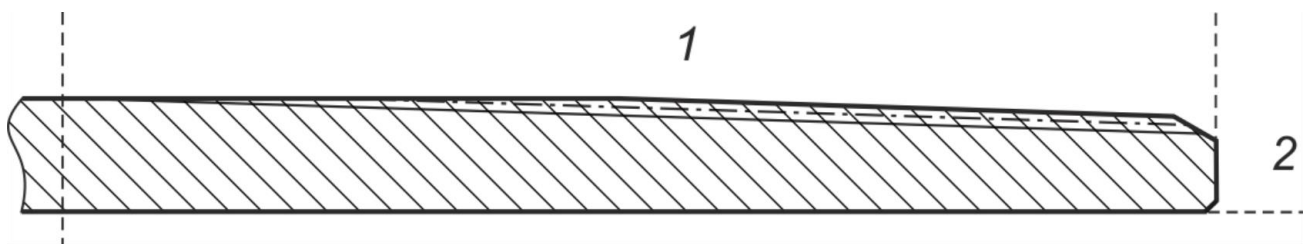
- Visual inspection of pipes and couplings for significant mechanical damages (ref. para 6.5.7);
- Cleaning of external and internal thread connections from compound and contaminations (ref. para. 5.4);
- Visual inspection of thread and thread shoulders surfaces of pins (ref. para. 6.5.10). In case of any damages detection, perform repair of thread connections or reject the pipes and couplings;
- Cleaning of thread protectors from previously applied compound and contaminations (ref. para. 5.8);
- Application of storage compound Kendex OCTG, BESTOLIFE Storage Compound (BSC), Total Jet Marine, RUSMA storage compound, RUSMA - M3 or thread compound with storage properties on thread connections of pins and couplings and installation of thread protectors according to para. 5.8.

6.5.10 Possible types of damages of thread, thread shoulders surfaces of pins and couplings after make-up, as well as repair methods are specified in Table 7 and figure 11.

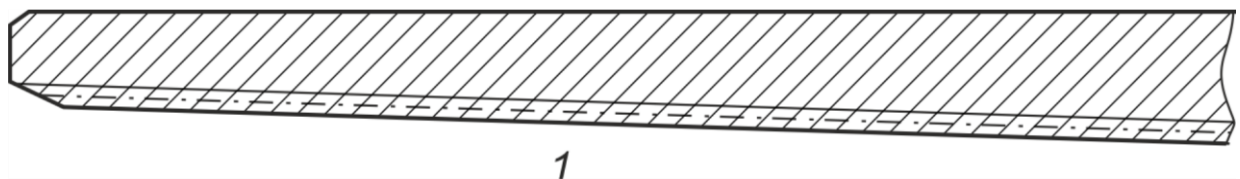


**Table 7 - Types of damages of thread connections after make-up - break out and methods of their repair.**

Surface area (Figure 10)	Type of Damages	Extent of damage As per time allowed for repair, but not more than	Method of repair
1	Irregularities Of profile (peaks and roots, figure 11)	Light damages which can be removed within not more than 10 minutes	Manual repair (removal of profile peaks up to the level of joining thread turn surface) using polishing paper with grain 100÷150 micron
		Moderate damages - which can be removed within not more than 10 minutes	Manual repair (removal of profile peaks up to the level of joining thread turn surface) using a needle file No.2, No.3, and polishing paper with grain 100÷150 micron for further treatment
		Severe damages - which can not be removed within 10 minutes	not to be repaired
	Dents, nicks Tears, grooves and other defects	Light damages which can be removed within not more than 10 minutes	Manual repair (removal) using polishing paper with grain 100÷-150 micron
		Moderate damages - which can be removed within not more than 10 minutes	Manual repair (removal) using a needle file No.2, No.3, and polishing paper with grain 100÷-150 micron for further treatment
		Severe damages - which can not be removed within 10 minutes	not to be repaired
2	Dents, nicks Tears, grooves and other defects	Light damages which can be removed within not more than 10 minutes	Manual repair (removal) using polishing paper with grain 100÷-150 micron
		Moderate damages - which can be removed within not more than 10 minutes	Manual repair (removal) using a needle file No.2, No.3, and polishing paper with grain 100÷-150 micron for further treatment
		Severe damages - which can not be removed within 10 minutes	not to be repaired



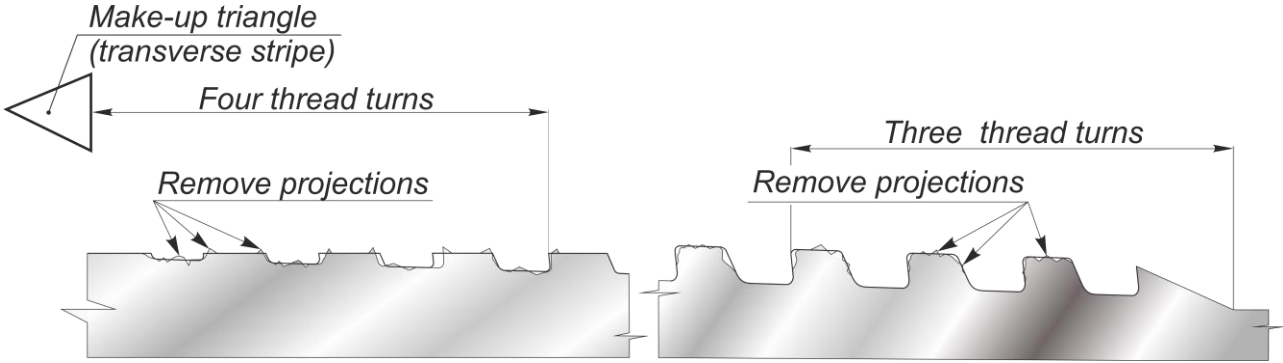
a) – Surface of external thread connection



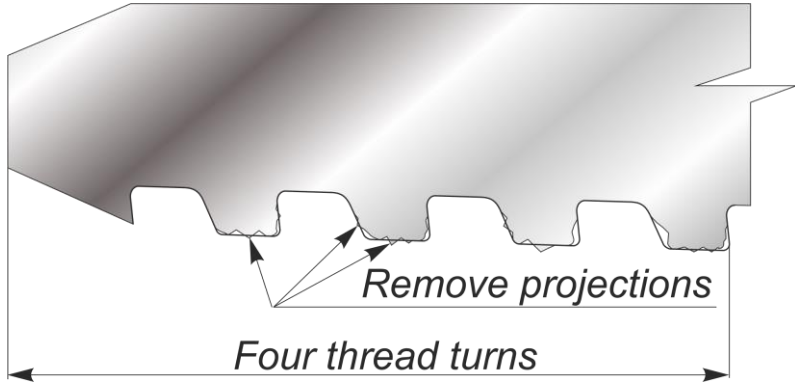
b) – Surface of internal thread connection

1 - thread (machined surface only); 2 - thread shoulder

**Figure 10**



a) – Surface of external thread connection



b) – Surface of internal thread connection

Figure 11

**7 Developer’s warranty**

Provided that the present recommendations are met, TMK UP SIMPLEX thread connection shall withstand at least 3 make-up and break-out cycles preserving the same technical characteristics.

## **Annex A**

(mandatory)

### **Requirements to safety upon casings operation**

#### **A.1 Safety Ensuring**

Measures to ensure safety during casings operation, including their putting into operation, technical maintenance, all types of repair, periodical diagnostics, tests, preservation are determined by the company that uses the equipment, consisting of casings.

#### **A.2 Specified service life rate**

The specified service life of casings shall be at least 365 days and nights since the moment of their putting into operation subject to compliance with the requirements of the present guidelines for use.

When the service life of casings is expired, the decision on their inspection and determination of new service life is made by the company that uses the equipment consisting of casings.

#### **A.3 list of critical failures**

Critical failures during casings operation are loss of tightness and thread connection or pipe integrity as a whole.

Critical failures may result from actions of the personnel connected with maintenance of the equipment, consisting of casings, and related to the non-compliance with the requirements of the present guidelines for use,

#### **A.4 Actions of personnel in case of failure or accident**

In case of critical failure or accident the personnel connected with maintenance of the equipment, consisting of casings, shall perform the following actions:

- inform the executives about failure or accident immediately;
- take measures to eliminate failure or accident and inform the executives about it.
- after elimination of failure or accident it is required to report briefly and exactly on the incident in the operator shift log, specifying the place, reason of failure or accident, measures taken to eliminate them.

Works on elimination of failure or accident shall be performed according to the plan worked out by the company than uses the equipment, consisting of casings.

## **A.5 Criteria of limit states**

### **A 5.1 Wall thickness loss and internal surface state**

The key factors which determine the limit state of casings are considered to be wall thickness loss and internal surface state.

Decrease in pipe wall thickness is stipulated by metal loss usually on pipe internal surface as a result of mechanical wear or galling, caused by mechanical effect of the equipment and pipes, located inside the casing string. Decrease of pipe wall thickness loss may result in uniform pipe wall wear or local mechanical damages.

Deterioration of pipe internal surface state is stipulated by corrosion environmental exposure, under conditions of which recovery is performed.

Maximum allowable pipe wall thickness loss (prior to decommissioning) - is 50% of the nominal wall thickness.

### **A.5.2 Evaluation of validity**

Evaluation of casings validity for further operation requires inspection of the wall thickness loss and pipes internal surface state to determine resistance to crumple, burst, tensile and corrosion effect, and shall be performed in compliance with the regulatory documentation on pipes.

## **A.6 Decommissioning and utilization**

Decommissioning of pipes shall be performed by the company that uses the equipment, consisting of casings, if the casings limit state criteria, specified in para 5.5, A,2 and A.5 of the present guidelines for use, are achieved. Decision on utilization of the casings shall be made up depending on the terms and conditions of well abandon.

## **A.7 Employee qualification**

Employee involved in maintenance of the equipment, which includes the casings, shall have professional training of not lower than advanced education.

Prior to putting pipes into operation the employee shall be acquainted with the casings specifications and with the present guidelines for use.