TEST OF SM1 SEAL FOR CPC/KXM PROJECT NOVOROSSIJSK
TESTING OF WAX REMOVING CAPABILITY OF STANDARD BOLT ON WAX SCRAPERS

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Attendees
Representative of JSC "Trust Koksokhimmontazh"     P.Yu. Astahov
Representative of HMT Rubbaglas Ltd     M.M. Palhun
Representative of HMT Tank Systems, NL     Rob van de Pol
Representative of HMT Tank Systems, NL     Jaco Steyn

Summary of the Test Result and Conclusion

Test Rig test of SM1 Primary Seal with Standard Bolt-On Wax Scrapers was set up to simulate the worst case scenario when the seal rides over the intersection of vertical and horizontal weld seams.

Rim seal gap for the test runs was set in 3 positions: 125mm, 200mm and 300mm.

The average total amount of wax remaining on the tank shell was 129.17 g/m\textsuperscript{2}
i.e. the average of remaining deposits in the 3 rim seal gap positions: \((87.5+141.7+158.3)/3\).

The resulting 129.17 g/m\textsuperscript{2} figure is considerably below the allowed maximum 200 g/m\textsuperscript{2} criteria for value of wax deposits on the tank shell.

Test results on the plate flat surface (without welds) was less than 80 g/m\textsuperscript{2}.

Conclusion:
SM1 Primary Seal with Standard Bolt-On Wax Scrapers meets and exceeds the requirements as stipulated in JSC "Trust Koksokhimmontazh" specification RE001A-41-26A-6784 Rev 3 - Sheet 12 – Notes: 1.2.

Signatures
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TEST METHOD DESCRIPTION

**Equipment**

- HMT Test rig
- SM1 primary seal section with bolt on wax scrapers
- Precision scales (tolerance 0.001 kg)
- Cleaning sponge
- Grease Lithol (oil substitute)
- Metal ruler 1 mm indents

**Procedure**

Testing is carried out using Test Rig of the seal manufacturer HMT Tank Systems as follows:

1. Set the rim gap between the FR and tank wall model to X=125 mm. Rim gap should not exceed X mm, and not be less than X-5 mm. Check dimensions using a metal ruler 1000 mm long. Measurement tolerance to be within ± 1 mm.
2. Set the speed of FR movement at 4 meters per hr.
3. Place the imitation tank wall at the lowest position on the stand.
4. Apply a uniform layer of oil substitute (Litol) 3-8mm thick to the imitation tank wall over the surface of 4m wide x 0.7m high.
5. Move the wall imitation screen to the upper position on the stand.
6. Quantify the weight of the Litol deposits remaining on 1 square metre of the tank wall.
7. The quantity of the remaining Litol is determined using a template with 200 x 200mm holes.
8. The weight of the remaining Litol on the tank wall model is determined using laboratory scales with unit measure of 0.001 kg.
   For evaluation, oil residue is collected through 200x200mm template holes using a dry cotton sponge which is weighed before and after the residue removal. The weight of the oil residue is equal to the weight difference of the sponge after and before the grease collection.
9. Set the rim gap between FR rim and tank wall model SM1 rim space X= 200 mm.
10. Follow steps 1 – 8
11. Set the rim gap between IFR rim and tank wall model to maximum SM1 rim space X= 300 mm.
12. Follow steps 1 – 8
13. The amount of the residue is calculated as a mean value (arithmetical average) of the Adjusted Residue Value in g/m². Results of the test to be filled in the test form Appendix A.
14. Oil residue can remain on seal elements.