



# API 682 Seal Qualification Test Certificate

|                                   |  |
|-----------------------------------|--|
| <b>Seal Tested:</b>               | CAPI Type B Dual   |
| <b>Nominal Sizes Tested:</b>      | 50mm (2")  |
| <b>Seal Materials Tested:</b>     | Premium Grade Blister Resistant Carbon Graphite<br>Reaction Bonded Silicon Carbide |
| <b>API Seal Type:</b>             | Type B   |
| <b>API Seal Configuration(s):</b> | 3CW-FB   |
| <b>API Seal Category:</b>         | 2, 3   |
| <b>API Flush Plan(s):</b>         | 11 & 53  |
| <b>Test Fluid:</b>                | Non-Flashing Hydrocarbon   |
| <b>Base Pressure:</b>             | 7 barg (100 psig)  |
| <b>Base Temperature:</b>          | 260°C (500°F)  |
| <b>Speed:</b>                     | 3600 rpm   |

**This is to certify that the above seals have been tested in accordance with API 682 requirements.**

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Group Engineering Director



ENVIRONMENTAL TECHNOLOGY

# Mechanical Seal Qualification Test Form



1CW, 2CW-CW, 3CW-FB, 3CW-FF, 3CW-BB

Test Ref: T5/4/PT00API\_12 Revision: 06/23

Manufacturer: AESSEAL plc Seal Type / Model: CAPI Type B Dual

Seal Type: A  B  C  ES

Materials of Construction: Primary Seal Faces: Antimony Carbon FH82A/SC2 Reaction Bonded Silicon Carbide Secondary Seal Faces\*: Antimony Carbon FH82A/SC2 Reaction Bonded Silicon Carbide

Secondary Seals: Fluoroelastomer/Graphite Metal Hardware: 316 SS

Seal Size: 50mm Seal Code: 3CW-FB Piping Plan: 11 & 53 Shaft Speed: 3600rpm

Pumped Fluid (Table I.2): Nonhydrocarbon (water, caustic acid)  Nonflashing Hydrocarbon  Flashing Hydrocarbon

Shaft Runout (Figure 19): 0.025mm Sleeve Runout (Figure 19): \_\_\_\_\_ Chamber Concentricity (Figure 12): 0.1mm Seal Chamber Face Runout (Figure 14): <0.1mm

Test Fluid: Mineral Oil Base-point Temperature °C (°F): 260 (500) Base-point Pressure MPa (bar) (psi): 0.7 / (7) / (102)

Relative Density (SG): 0.873 Vapor Pressure: N/A Solids: None Particle Size: N/A \*Dual Seals

| DYNAMIC TEST<br>100 h minimum  |       |       | Pressure<br>barg (psig) | Process Temp.<br>°C (°F) | Flush Temp.<br>IN<br>°C (°F) | Flush Temp.<br>OUT<br>°C (°F) | Flush Flow Rate<br>m <sup>3</sup> /h (U.S. gal/min) | Seal Chamber<br>Temp.<br>°C (°F) | Barrier Fluid<br>Pressure<br>barg (psig) | Barrier Fluid Temp.<br>IN<br>°C (°F) | Barrier Fluid Temp.<br>OUT<br>°C (°F) | Power<br>Consumption<br>kW (hp) | Hydrocarbon<br>Leakage<br>g/day | Nonhydrocarbon<br>Leakage<br>cm <sup>3</sup> /min | Circulating Device<br>m <sup>3</sup> /h (U.S. gal/min) |
|--------------------------------|-------|-------|-------------------------|--------------------------|------------------------------|-------------------------------|---|----------------------------------|--|--------------------------------------|---------------------------------------|---------------------------------|---------------------------------|---|--|
| Date                           | Time  |       |                         |                          |                              |                               |   |                                  |  |                                      |                                       |                                 |                                 |   |  |
|                                | Start | Stop  |                         |                          |                              |                               |   |                                  |  |                                      |                                       |                                 |                                 |   |  |
| 13-12-2002                     | 13:00 |       | 6.87 (100)              | 255 (493)                | 228 (442)                    | 256 (493)                     | 0.31 (1.4)  | 258 (496)                        | 8.00 (116)                               | 111 (232)                            | 147 (297)                             | 0.86 (1.2)                      | 0                               | N/A   | 0.18 (0.8)   |
| 17-12-2002                     |       | 17:00 | 7.20 (104)              | 260 (500)                | 233 (451)                    | 261 (502)                     | 0.37 (1.6)  | 262 (504)                        | 7.51 (109)                               | 103 (217)                            | 140 (284)                             | 0.79 (1.1)                      | 0                               | N/A   | 0.24 (1.1)   |
| STATIC TEST<br>4 h minimum     |       |       |                         |                          |                              |                               |   |                                  |  |                                      |                                       |                                 |                                 |   |  |
| 17-12-2002                     | 17:00 |       | 7.20 (104)              | 260 (500)                | 233 (451)                    | 261 (502)                     | 0.37 (1.6)  | 262 (504)                        | 7.51 (109)                               | 103 (217)                            | 140 (284)                             | 0                               | 0                               | N/A   | 0  |
| 18-12-2002                     |       | 09:04 | 7.29 (106)              | 260 (500)                | 233 (451)                    | 261 (502)                     | 0.37 (1.6)  | 262 (504)                        | 7.72 (112)                               | 41.8 (107)                           | 193 (379)                             | 0                               | 0                               | N/A   | 0  |
| CYCLE TEST<br>5 cycles minimum |       |       |                         |                          |                              |                               |   |                                  |  |                                      |                                       |                                 |                                 |   |  |
| 18-12-2002                     | 09:33 |       | 7.28 (106)              | 259 (498)                | 231 (448)                    | 260 (500)                     | 0.37 (1.6)  | 261 (502)                        | 7.83 (113)                               | 94.9 (203)                           | 130 (266)                             | 0.82 (1.1)                      | 0                               | N/A   | 0.24 (1.1)   |
| 19-12-2002                     |       |       | 7.06 (102)              | 259 (498)                | 213 (415)                    | 259 (498)                     | 0.31 (1.4)  | 260 (500)                        | 7.90 (115)                               | 115 (239)                            | 145 (293)                             | 0.84 (1.1)                      | 0                               | N/A   | 0.25 (1.1)   |
| 20-12-2002                     |       | 15:27 | 7.19 (104)              | 260 (500)                | 230 (446)                    | 261 (502)                     | 0.32 (1.4)  | 262 (504)                        | 7.86 (114)                               | 78.2 (173)                           | 187 (369)                             | 0                               | 0                               | N/A   | 0  |

This is to certify that the seal noted above has been tested in accordance with the API 682 requirements.

Notes:

1. Conducted to latest version of API 682 at time of test; 1st edition.
2. API 682 specifies pass rate for liquid leakage as <5.6 g/h which equates to 134.4 g/day or 1000ppm for gas and vapour.
3. Average outer seal leakage barrier fluid measured at less than <30g/hr
4. kW / HP are calculated theoretical values.

Authorised By:  
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Group Engineering Director



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