merl materials engineering research laboratory

Test Certificate

This document certifies that

compound HN114 from

Gapi Group

meets the requirements of

NORSOK M710 [Rev. 2, October 2001] in respect of rapid gas decompression resistance in 10% carbon dioxide at 150 bar and 100°C

Test gas:	90/10 mol% CH_4/ CO_2
Test temperature:	100 °C
Test pressure:	150 bar
Decompression rate:	20.2 bar/minute
Passed by:	Keyur Somani and Barry Thomson
Date:	21st September 2011

MERL has been assessed to BS EN ISO 9001 by the British Standards Institution (BSI) and is a registered firm under the BSI Quality Assurance scheme for the provision of professional and technical services.

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MERL verify that O-rings manufactured by Gapi Group, in compound **HN114** have been subjected to a multi-cycle RGD test under the conditions detailed below.

Seal Conditions

O-rings details: - Compound HN114
Size BS 1806 size 312
Section diameter 5.33 mm, nominal; 5.25 mm, actual (radial)
Groove fill 82%, calculated

Test Gas

10% CO_2 in methane; certified.

Procedure and Test Conditions

For each test cycle the following procedure and conditions applied:
1) the assembly was heated to 100°C and this temperature maintained throughout
2) a pressure of 150 bar, using the test gas, was applied
3) this pressure was maintained for 72 hours minimum (cycle 1)
4) gas was vented in 7.5 minutes from 150 bar to atmospheric
5) after 1 hour, test pressure was re-applied, for 24 hours (cycle 2)
6) Subsequent cycles (3-10) were of duration 24 hours.

After the test, each of the three replicate test O-rings was quartered and the exposed surfaces rated according to the NORSOK M 710 Rev 2 standard (Table B.2).

NORSOK Ratings for Gapi Group test seal

Compound	Summary rating (average of three)	PASS/FAIL
HN114	1100	**PASS**

Summary
HN114 O-rings (size 312) meet the RGD acceptance requirement given in the NORSOK M-710 standard [Rev. 2, October 2001]. This acceptance applies at all pressure and temperature combinations up to the levels employed above, and only for the groove geometry employed in testing.