

Radio Test Report

Ocean Signal Limited
EPIRB1

In accordance with RTCM 11000.3

Prepared for: Ocean Signal Limited
Unit 4
Ocivan Way
Margate
Kent
CT9 4NN
UNITED KINGDOM



Add value.
Inspire trust.

COMMERCIAL-IN-CONFIDENCE

Document 75947524-01 Issue 02

SIGNATURE

Two handwritten signatures in black ink. The first signature is 'Gareth Stephens' and the second is 'Ryan Henley'.

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Gareth Stephens	Key Account Manager	Authorised Signatory	31 March 2020
Ryan Henley	Sales Manager - RF and Telecom	Authorised Signatory	31 March 2020

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with RTCM 11000.3 June 2012 for the tests detailed in section 1.3.

DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD. No part of this document may be reproduced without the prior written approval of TÜV SÜD. © 2020 TÜV SÜD. This report relates only to the actual item/items tested.

TÜV SÜD
is a trading name of TÜV SÜD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



Contents

1	Report Summary	2
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results	3
1.4	Declaration of Build Status	4
1.5	Product Information	5
1.6	Deviations from the Standard.....	5
1.7	EUT Modification Record	5
1.8	Test Location	5
2	Test Details	6
2.1	Ergonomics Test	6
2.2	Documentation	9
2.3	Labelling	11
2.4	Vibration	16
2.5	Ruggedness	26
2.6	Annex D – Internal Navigation Device	30
3	Photographs	33
3.1	Equipment Under Test (EUT).....	33
4	Measurement Uncertainty	34
ANNEX A	Manufacturer Supplied Data	A.2



1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	17 January 2020
2	Correction to typographical errors	31 March 2020

Table 1

1.2 Introduction

Applicant	Ocean Signal Limited
Manufacturer	Ocean Signal Limited
Model Number(s)	EPIRB1
Serial Number(s)	0915139 0711180T (EPIRB1 Pro)
Hardware Version(s)	1.0
Software Version(s)	1.0
Number of Samples Tested	1
Test Specification/Issue/Date	RTCM 11000.3
Order Number	08909
Date	03-October-2019
Date of Receipt of EUT	13-November-2019
Start of Test	02-December-2019
Finish of Test	17-January-2020
Name of Engineer(s)	Martin Hardy A Uminski L Gofford S Ho F Van Niekerk C Bowles I Bromley



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with RTCM 110110.3 is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
2.1	A.3	Ergonomics Tests	-	See section 2.2
2.2	A.4	Documentation	-	See section 2.3
2.3	A.5	Labelling	-	See section 2.4
2.4	A.6	Vibration	Satisfactory	Performance Checks Pass
2.5	A.7	Ruggedness	Satisfactory	Performance Checks Pass
2.6	Annex D	Internal Navigation Device	Pass	

Table 2



1.4 Declaration of Build Status

MAIN EUT			
MANUFACTURING DESCRIPTION	Cospas/Sarsat 406MHz EPIRB		
MANUFACTURER	Ocean Signal Ltd		
MODEL	EPIRB1 Pro		
PART NUMBER	900S-03377		
HARDWARE VERSION	01.00		
SOFTWARE VERSION	01.00		
PSU VOLTAGE/FREQUENCY/CURRENT	9V		
HIGHEST INTERNALLY GENERATED FREQUENCY	406.04MHz		
FCC ID (if applicable)			
INDUSTRY CANADA ID (if applicable)			
TECHNICAL DESCRIPTION (a brief technical description of the intended use and operation)	Float free Cospas/Sarsat distress beacon		
COUNTRY OF ORIGIN			
RF CHARACTERISTICS (if applicable)			
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	121.5MHz & 406.04MHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	N/A		
INTERMEDIATE FREQUENCIES	N/A		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	3K20A3X & 16K0G1D		
MODULATION TYPES: (i.e. GMSK, QPSK)	Swept tone AM & BPSK		
OUTPUT POWER (W or dBm)	25-100mW & 5W		
SEPARATE BATTERY/POWER SUPPLY (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
PSU VOLTAGE/FREQUENCY/CURRENT			
COUNTRY OF ORIGIN			
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			
DHSS/FHSS/COMBINED OR OTHER			
COUNTRY OF ORIGIN			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			
COUNTRY OF ORIGIN			

I hereby declare that the information supplied is correct and complete.

Name: Wayne Card
Position held: Senior Engineer
Date: 19/09/19



1.5 Product Information

1.5.1 Technical Description

The Ocean Signal Limited EPIRB1 is an Emergency Location Transmitter with built-in 406 MHz Cospas-Sarsat and 121.5 MHz Homing transmitters. It is used to assist in the locating and recovery of individuals that are in imminent danger.

1.6 Deviations from the Standard

Ergonomics Tests, section 2.1: Male subject wore full length gloves from an immersion suit, rather than full suit. Ergonomics test carried out by one male and one female subject only, with as hands measuring as close to the requirements as possible.

No other deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Ergonomics Test	-	Not accredited
Documentation	Martin Hardy	Not accredited
Labelling	Martin Hardy	Not accredited
Vibration	I Bromley, S Ho, A Uminski	UKAS
Ruggedness	I Bromley, S Ho, A Uminski	UKAS
Internal Navigation Device	Adrian Uminski	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Ergonomics Test

2.1.1 Specification Reference

RTCM 11000.3, Clause A.3

2.1.2 Equipment Under Test and Modification State

EPIRB1, S/N: 0915139T– Modification State 0
EPIRB1 Pro, S/N: 0711180T– Modification State 0

2.1.3 Date of Test

17 December 2019
17 January 2020

2.1.4 Test Method

“Each individual control or operation necessary to deploy or activate the EPIRB, including, but not limited to, removing the EPIRB from its bracket, manual activation and deactivation, transfer to a survival craft, deploying the lanyard and deploying/de-stowing any other retention/carriage means, shall be able to be readily and easily accomplished with a single hand (while if necessary the EPIRB is supported by some means). The design shall encompass a range of hand sizes... From a bare female hand to a male hand wearing an immersion suit mitten or glove... of appropriate size).”

Actions a) to c) and e) were demonstrated and were readily and easily accomplished with a single hand by both male and female test subjects. Action d) was demonstrated with both hands kept free by the same test subjects. Action e) was demonstrated successfully by the same test subjects.



Figure 1



Figure 2

2.1.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	39.1 %



2.1.7 Test Results

Requirement	Successful completion by male test subject	Successful completion by female test subject	Comments
a) The EPIRB can be removed from it's bracket	PASS	PASS	Both parties did this with no instruction.
b) Each individual control on the EPIRB can be activated and deactivated	PASS	PASS	Both parties did not find the power button easily. The button was activated successfully by both parties. However, guidance had to be given as to having to hold the button until LED activation. No information is given on deactivating the beacon. Both parties had to be fully instructed on turning off of the beacon.
c) any hands free carriage means can be deployed/destowed, then can be fitted/attached to the person and if necessary adjusted to ensure a good fit.	PASS	PASS	This was achieved by both parties. No issues and was easily put upon the person once deployed.
d) after being prepared as in c) above, the EPIRB can be securely carried hands-free while climbing up and down a vertical ladder at least 3 meters in height	PASS	PASS	This was achieved by both parties. The Beacon was able to be left and both hands were free for climbing. It was noted however that due to having to go on the wrist, the climb was a little hindered as it swung back and forth on the wrist into the ladder.
e) the lanyard can be deployed	PASS	PASS	The male member was able to remove the lanyard. The female was unsure as to where the lanyard was and was instructed as to where this was.
The minimum breaking force of any hands-free retention means shall be demonstrated by the inspection of evidence submitted by the manufacturer that it meets the specified requirements.	-	-	See Annex A.

Table 5

2.1.8 Test Location and Test Equipment Used

This test was carried out in Climatic Area.

No test equipment was used.



2.2 Documentation

2.2.1 Specification Reference

RTCM 11000.3, Clause A.4

2.2.2 Equipment Under Test and Modification State

EPIRB1, S/N: 0915139T– Modification State 0

2.2.3 Date of Test

02-December-2019

2.2.4 Manufacturer Supplied Information

Requirements as per RTCM11000.3, clause 2.3.6	Pass/Fail	Manufacturer Manual Information
The EPIRB equipment manual shall contain the following:		
A wordless pictorial drawing(s) depicting the operation of the EPIRB. This drawing(s) should be on the inside front or inside back cover of the operator manual.	Pass	Drawing provided on page 3 of manual.
Cautions and recommendations to prevent false alarms.	Pass	Information provided on page 9 of the manual.
For 406 MHz EPIRBs sold in the USA a NOAA EPIRB Registration Form together with instructions on how to register, clearly stating that the preferred method of registration is online at www.beaconregistration.noaa.gov .	Pass	Information provided on page 14 of the manual.
Requirements as per IEC61097-2 Ed3, clause 3.11, para 5.11	Pass	Manufacturer Manual Information
The EPIRB equipment manual shall contain the following:		
Maintenance	Pass	Information provided in section 6 of the manual.
Adequate information shall be provided to enable the equipment to be properly stowed, installed, operated and tested.	Pass	Installation and stowage information provided in section 2 of the manual. Operation and testing information provided in sections 4 and 5 of the manual.
The information supplied with the satellite EPIRB shall include pictorial operating instructions on a waterproof placard, suitable for mounting on a bulkhead. Numerals may be used to indicate the order of the illustrated operations, but words should not be used as part of the instructions.	N/A	Float Free not supported by EPIRB.
an overview of the COSPAS-SARSAT system	Pass	Information provided on page 6 of the manual.
complete instructions for the operation and the self testing of the satellite EPIRB	Pass	Operation and testing information provided in sections 4 and 5 of the manual.
cautions and recommendations to prevent false alerts	Pass	Information provided in section 4.3 of the manual.
instructions for licensing and registration, registration renewal and a discussion on the importance of accurate registration	Pass	Information provided on page 14 of the manual.
battery information including replacement instructions, battery type, and safety information regarding battery use and disposal	Pass	Information provided in section 6 of the manual.

Table 6



an instruction to replace the battery after the satellite EPIRB is operated for any purpose other than a test	Pass	Information provided in section 6 of the manual.
the minimum operating life-time and operating and stowage temperatures	Pass	Information provided in section 6 of the manual.
the purpose of the lanyard and a precaution against using it to secure the satellite EPIRB to the ship	Pass	Information provided in section 3 of the manual.
a recommendation against attempting to operate the satellite EPIRB inside a life raft or under any similar cover or canopy	Pass	Information provided in section 1 of the manual.
the servicing and/or replacement of any hydrostatic release unit and any associated components subject to ageing, such as release rods	N/A	Not applicable (manual release only).
manufacturer recommendations, if any, on periodic functional testing, possibly in connection with battery replacement	Pass	Information provided in section 5 of the manual.
a note to keep the original satellite EPIRB packaging, since it may be needed if the EPIRB has to be shipped for servicing. UN requirements for shipping some batteries as hazardous goods require certain packaging standards and labelling	Pass	Information provided in section 6 of the manual.
instructions for the safe transportation or shipping of the satellite EPIRB or the location where such information can be obtained by the user	Pass	Information provided in section 6 of the manual.
warranty information	Pass	Information provided in section 6 of the manual.
a warning to the effect that the Satellite EPIRB shall not be operated except in an emergency	Pass	Information provided in section 4 of the manual.
a warning against installation near strong magnetic fields, if that might activate the satellite EPIRB	Pass	Information provided in section 2 of the manual.
a recommendation to mounting the satellite EPIRB as high as possible, especially on small vessels. This will help ensure operation of the hydrostatic float-free release unit, in the event the vessel capsizes without sinking	N/A	Not applicable (manual release only).
a recommendation to limit self-testing to the minimum necessary to ensure confidence in the operation of the satellite EPIRB	Pass	Information provided in section 5 of the manual.
a warning to limit testing to the first five minutes of the hour, as the satellite EPIRB emits a 121,5 MHz signal during self-test	Pass	Information provided in section 5 of the manual.
if appropriate a list of approved external GNSS Receivers for those satellite EPIRBs accepting external navigation inputs together with instructions for connecting and setting up the external devices	N/A	Not applicable (external GNSS data not accepted by EPIRB).
if appropriate for those satellite EPIRBs with an integral GNSS receiver or that can be interfaced with an external GNSS receiver, information to guide the operator towards maximizing self-locating performance including a warning not to obstruct the GNSS antenna's view of the sky	Pass	Recommendations provided in section 1 and 4 of the manual.
The equipment manual shall include information explaining the necessity to report satellite EPIRB false alarms by the most expedient means to the nearest search and rescue authorities. The information that should be reported includes the satellite EPIRB 15-Hex ID; date, time, duration and cause of activation; and location at time of deactivation	Pass	Information provided in section 4 of the manual.

Table 7



2.3 Labelling

2.3.1 Specification Reference

RTCM 11000.3, Clause A.5

2.3.2 Equipment Under Test and Modification State

EPIRB1, S/N: 0915139T– Modification State 0

2.3.3 Date of Test

03-December-2019

2.3.4 Manufacturer Supplied Information

Requirements as per IEC61097, clause 5.12	Pass/Fail	Manufacturer Label Reference
The label or labels shall be placed on the satellite EPIRB itself and on its container, if any, as needed		
Brief operating instructions at least in English, to enable manual activation, deactivation and self-test	Pass	See exhibit 1 below
Warning to the effect that the satellite EPIRB shall not be operated except in an emergency	Pass	See exhibit 2 below
Type designation and class as specified by the manufacturer, type of battery and expiry date for the primary battery used	Pass	See exhibit 3 below
The name of the ship and beacon identification data: 1) the identity code programmed into the transmitter of the satellite EPIRB (i.e. hexadecimal representation of bits 26 to 85 of the digital message, as described in C/S T.001), together with the call sign or MMSI of the ship as required by the Administration and the MID; 2) country (i.e. name of country as programmed in the MID); 3) a space for registration information (for instance Decals) as required by administrations	Pass	See exhibits 3 and 4 below
If applicable, for those satellite EPIRBs with an integral GNSS receiver or that can be interfaced with an external GNSS receiver, a statement that the device either contains a GNSS receiver or may be interfaced to one and, if necessary, brief operating instructions relevant to this feature	Pass	See exhibit 5 below
A warning to limit testing to the first five minutes of the hour, as the satellite EPIRB emits a 121,5 MHz signal during self-test	Pass	See exhibits 2 and 7 below
The float-free arrangement shall carry a label or labels indicating clearly at least in English		
The operating instructions for manual release	N/A	Float Free not supported by EPIRB
The type designation	N/A	Float Free not supported by EPIRB
The satellite EPIRB class	N/A	Float Free not supported by EPIRB
The maintenance and/or replacement date for the release mechanism, if applicable	N/A	Float Free not supported by EPIRB
If this label or labels are not readily visible in the installed arrangement, they shall be provided in addition, for installation close to the float-free arrangement. These instructions may in addition be shown in pictorial form		
Requirements as per RTCM11000.3, clause 2.3.7	Pass/Fail	Manufacturer Label Reference
In addition to the requirements of IEC 61097-2 Ed3.0 Paragraph 5.12 the EPIRB shall also carry the following additional labels		
Battery Labelling		

The battery shall be marked indelibly and legibly with the battery type, voltage, polarity, expiration date (month and year) and as appropriate, precautions associated with its use, handling and disposal	Pass	See exhibit 8 below
All wires to battery connectors should be uniquely colour coded. The wire to the most positive (+) terminal should be RED; the wire to the most negative (-) terminal should be BLACK. Colours other than black and red should be used for wires connecting intermediate voltage levels in multi-voltage battery packs	Pass	See manufacturer document '901S-01393 Issue 02.01 Battery Assembly Epirb1.pdf'
The following additional labelling shall be applied to the interior of the EPIRB in a conspicuous place on the battery pack itself: WARNING! Regulated lifesaving device. Unauthorized battery replacement may lead to failure. For details: (insert manufacturer's telephone number or website address)	Pass	See exhibit 6 below
EPIRB Labelling - The following additional labelling shall be applied to the exterior of the EPIRB		
Its operating temperature range in degrees C and F	Pass	See exhibit 3 below
The safe distance of the EPIRB from the magnetic compass	Pass	See exhibit 7 below
Either on the exterior of the EPIRB or permanently attached to the EPIRB, an explanation of the operation of the automatic water-immersion activation function, and how the EPIRB works in the various control positions. If permanently attached, the placard including the instruction(s) shall be conspicuously marked adjacent to the attachment point: "DO NOT REMOVE"	Pass	See exhibit 9 below
For EPIRBs registered in the USA, an outlined or otherwise identifiable space sized to accommodate the NOAA proof-of-registration decal (26mm H x 51mm W) is required on the case of the EPIRB with the text "Affix NOAA Registration Decal Here". This space shall be located so that the decal is visible without having to remove the EPIRB from its bracket. The decal may NOT cover the two spaces for name of vessel and 15 - Hex ID	Pass	See exhibit 10 below
A notice stating "In the event of a false activation in the USA call toll free 855 406 USCG (855 406 8724)"	Pass	See exhibit 7 below

Table 8

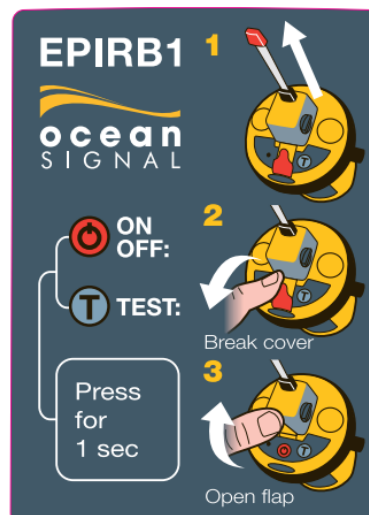




Figure 3 – Exhibit 1

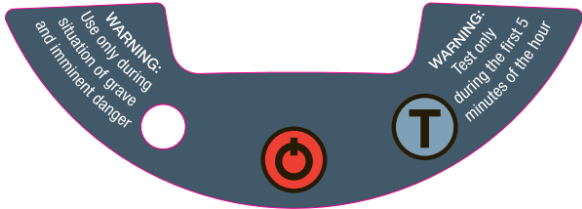
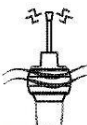


Figure 4 – Exhibit 2



Activation:
Remove from
cradle, deploy
antenna and
depress on button
for 1 second

Class:2 - 20° C to + 55° C
Category:2 - 4° F to + 131° F
48h Minimum Operation
9V Lithium Batt
Expires: MAY2030
Serial No. XXXXXXXXXXXX
UIN:XXXXXXXXXXXXXX

Call Sign:
Vessel:
MMSI:

Figure 5 – Exhibit 3

This EPIRB must be registered with the National Authority.
Registering your EPIRB will greatly aid rescue authorities
if the EPIRB is activated in a distress situation.
Failure to register the EPIRB may result in prosecution.
See <http://406registration.com> for registration authority details.

Country: CountryNameHere

MODEL: rescueMe EPIRB1 SerNo: XXXXXXXXXXXX

UIN: XXXXXXXXXXXXXXXXX

Ocean Signal Ltd., Unit 4, Ocivan Way, Margate, CT9 4NN, UK

Made in the UK

Figure 6 – Exhibit 4



Figure 7 – Exhibit 5



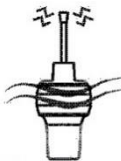
Figure 8 – Exhibit 6



Figure 9 – Exhibit 7



Figure 10 – Exhibit 8



Auto Activation:
Remove from
cradle, deploy
antenna and
place in water

Class:2 - 20° C to + 55° C
Category:2 - 4° F to + 131° F
48h Minimum Operation
9V Lithium Batt
Expires: MMMYYYY
Serial No. XXXXXXXXXXXX

Call Sign:
Vessel:
MMSI:

Figure 11 – Exhibit 9

ATTACH PROOF OF REGISTRATION HERE
Owner must register EPIRB with the relevent national authority. In
US the owner of this EPIRB must register the ID code contained on
this label with NOAA:SARSAT BEACON REGISTRATION, NOAA,
NSOF, ESP053, 1315 East West Hwy, Silver Spring, MD 20910
www.beaconregistration.noaa.gov USA CANCEL ALERT 1 855 406 8724
Country: CountryNameHere Check Sum: ABCDE
MODEL: rescueMe EPIRB1 SerNo: 0160823456M
UIN: XXXXXXXXXXXXXXXX

Made in the UK

Figure 12 – Exhibit 10



2.4 Vibration

2.4.1 Specification Reference

RTCM 11000.3, Clause A.6

2.4.2 Equipment Under Test and Modification State

EPIRB1, S/N: 0915139T– Modification State 1

2.4.3 Date of Test

16 January 2020 – 17 January 2020

2.4.4 Test Method

The EUT was fixed to the vibration table and was subject to the following vibration profiles:

Resonance Sweep

- 5 Hz and up to 13.2 Hz with an excursion of ± 1 mm (7 m/s² maximum acceleration at 13.2 Hz);
- above 13.2 Hz and up to 100 Hz with a constant maximum acceleration of 7 m/s².

One sweep was performed at a rate of 0.5 octaves / minute.

The EUT was subjected to a 2 hour dwell at each of the following resonant frequencies:

Axis	Resonant Frequency (Hz)
X (front to back)	100.0 Hz
Y (side to side)	52.2 Hz
Z (up and down / vertical)	100.0 Hz

Table 9

During the test a spectrum analyser and handheld beacon tester were set to monitor the EUT output to ensure that there were no unintentional transmissions. At the conclusion of the test, The EUT was subjected to a performance check. The EPIRB did not activate during this test.

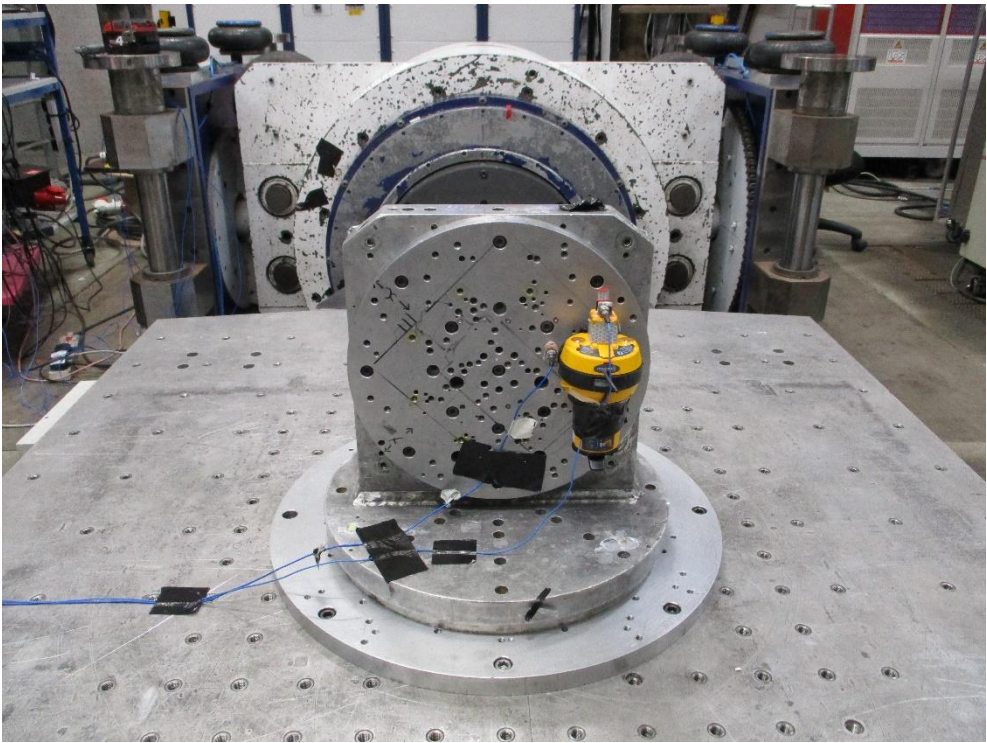


Figure 13 – Front to Back Axis

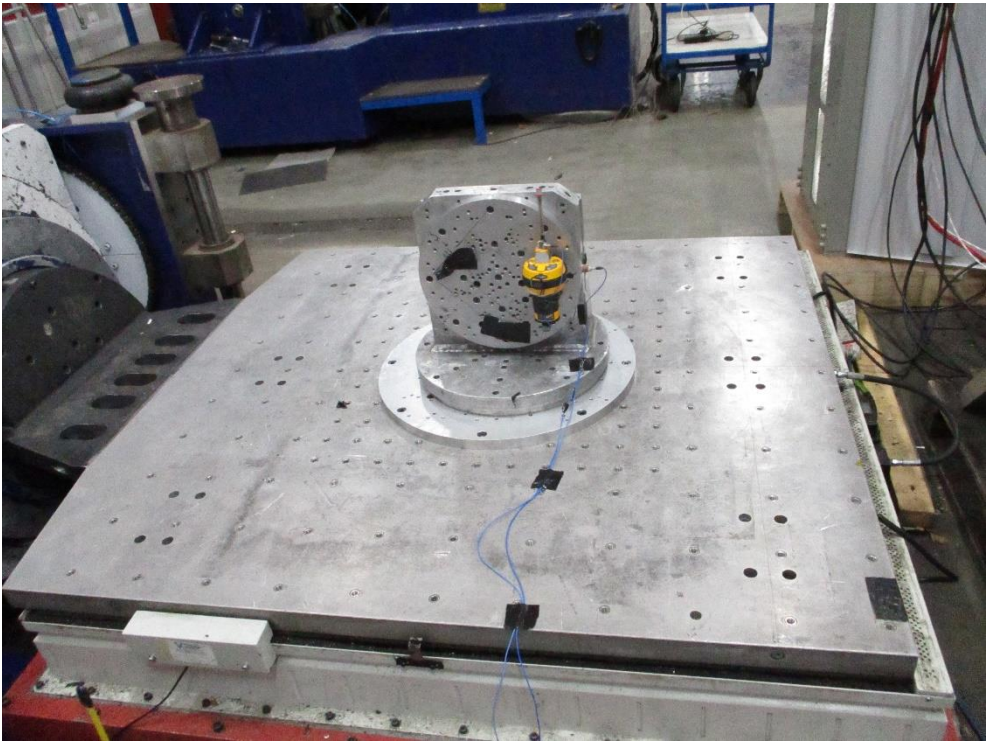


Figure 14 – Side to Side Axis

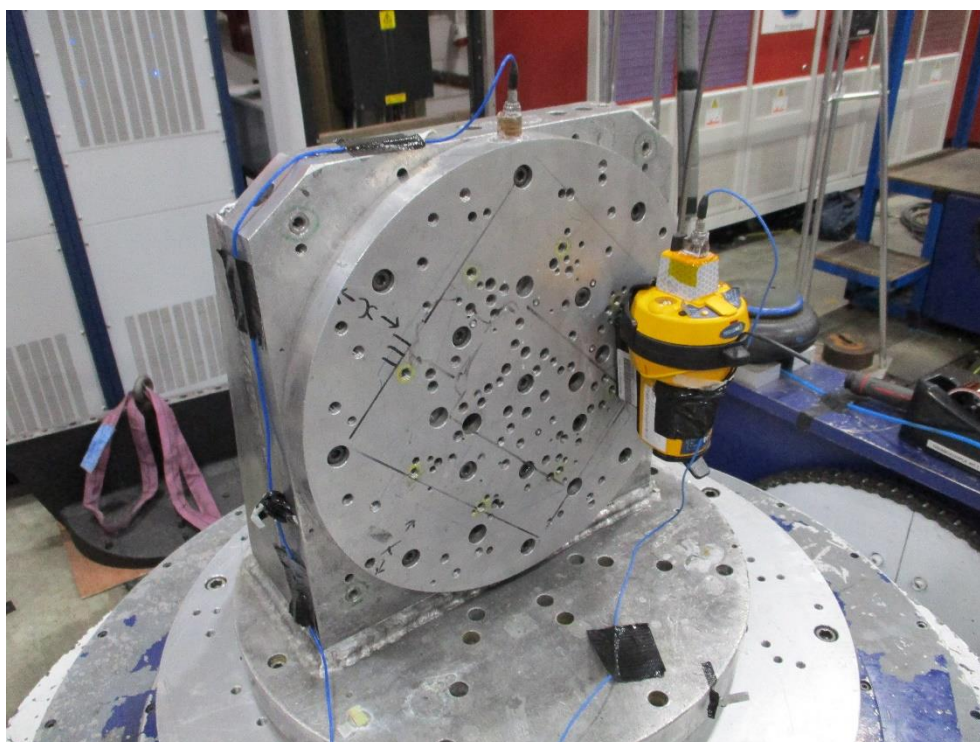


Figure 15 – Up and Down Axis

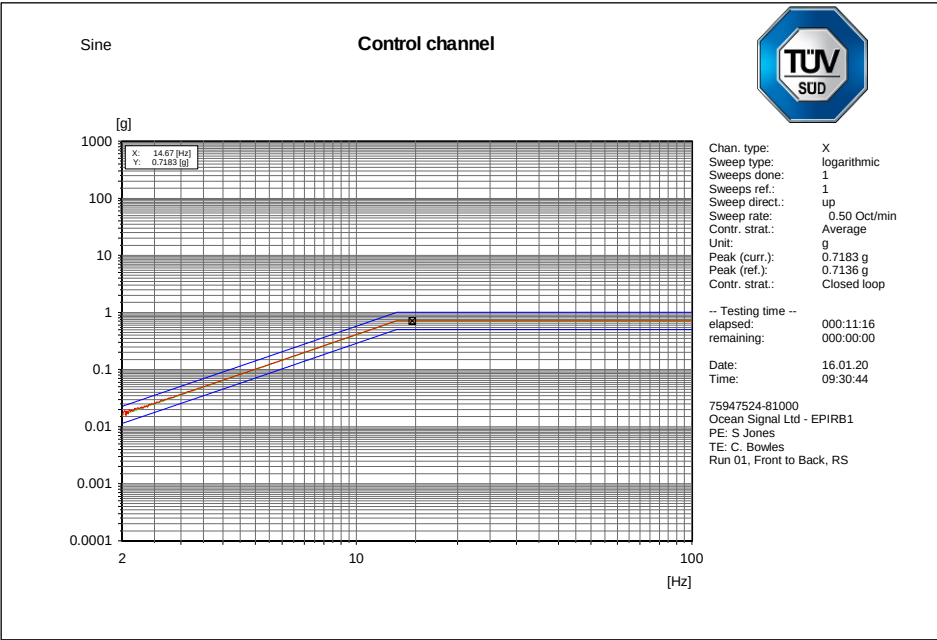
2.4.5 Environmental Conditions

Ambient Temperature	17.6 – 20.8°C
Relative Humidity	39.8 – 47.9%

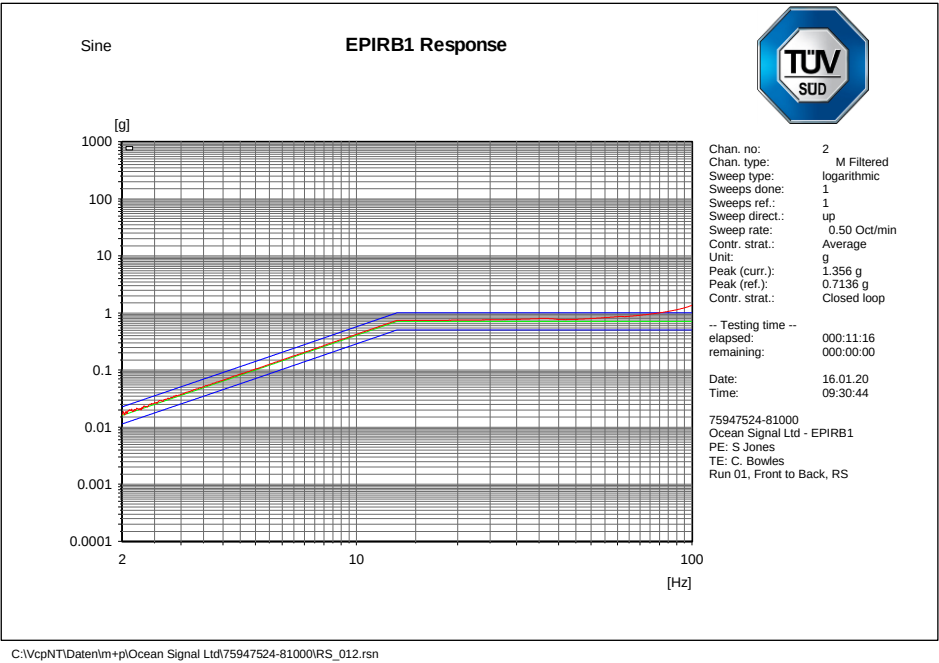


2.4.6 Test Results

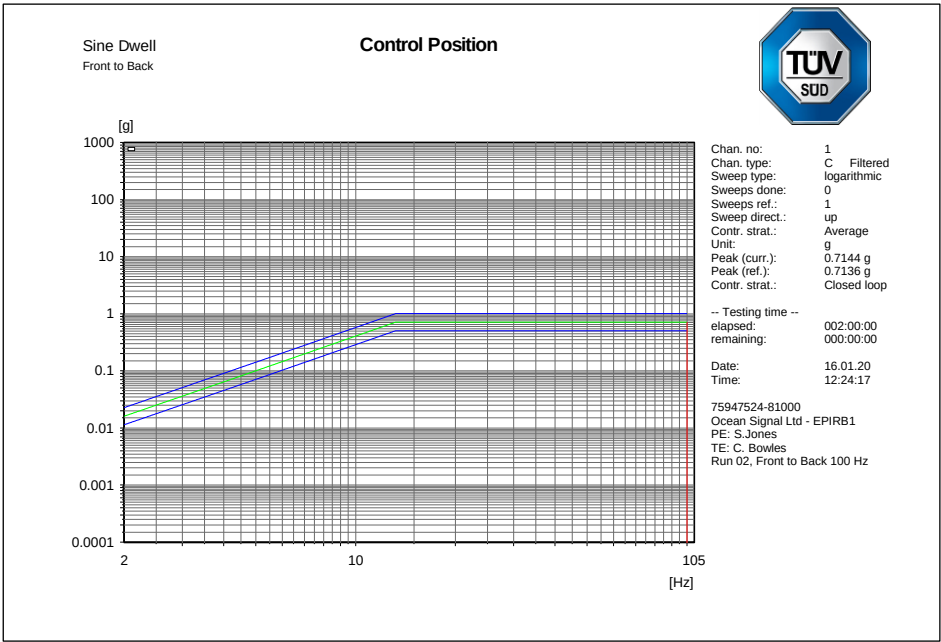
Front to back axis



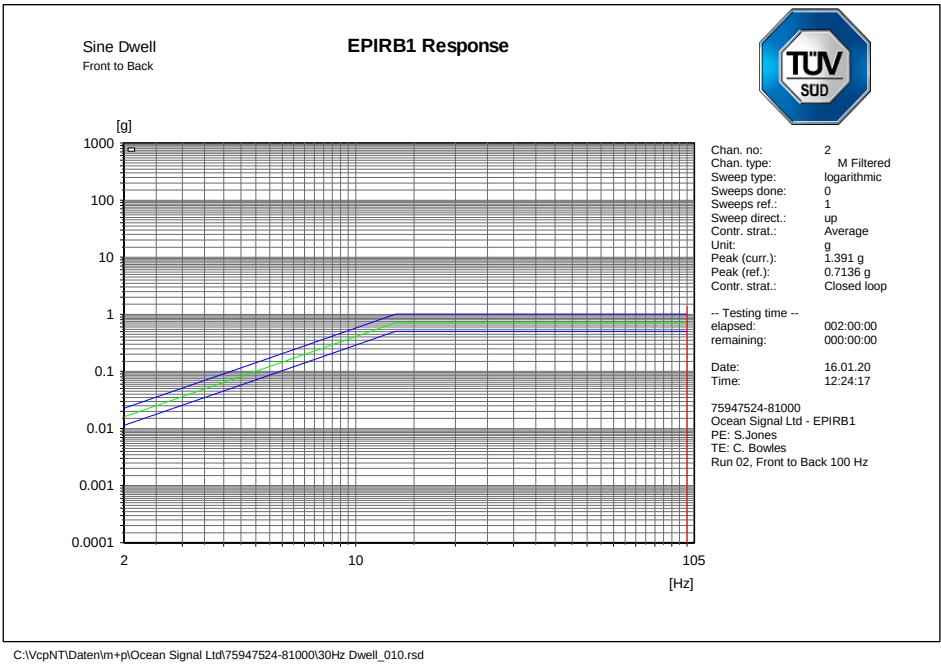
Resonant Search – Control Channel



Resonant Search – EUT



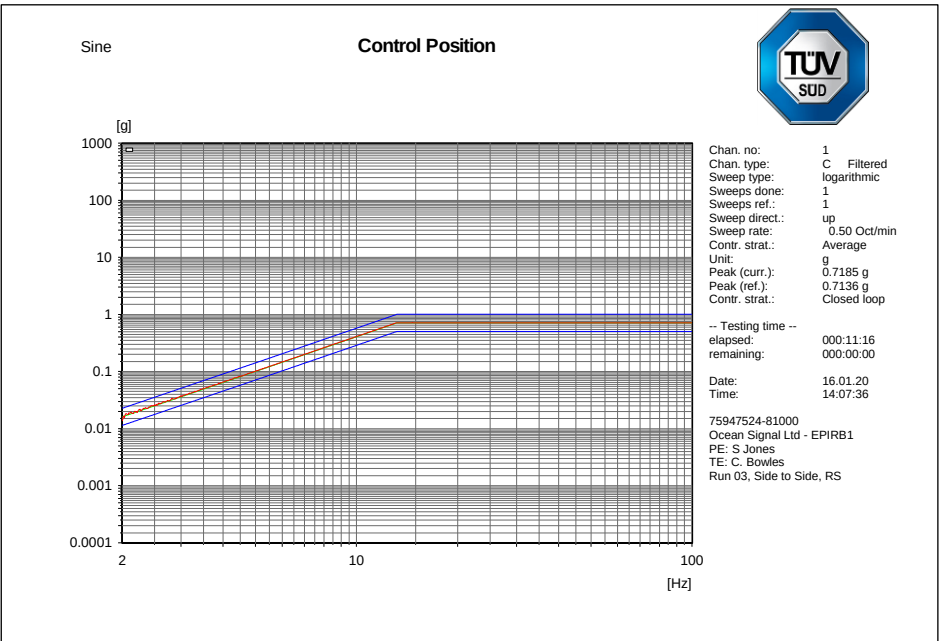
Endurance Run – Control Channel



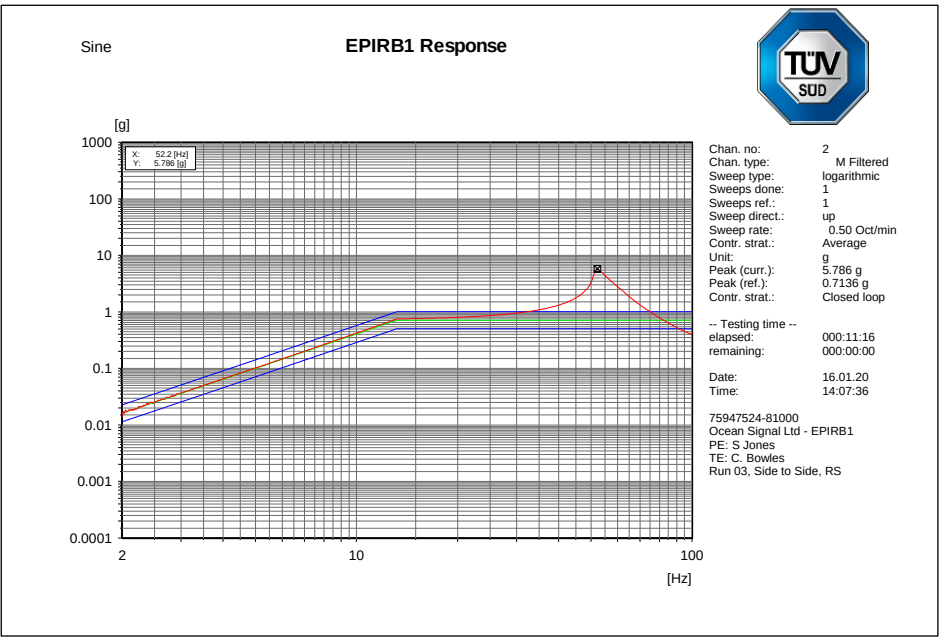
Endurance Run (100 Hz) – EUT



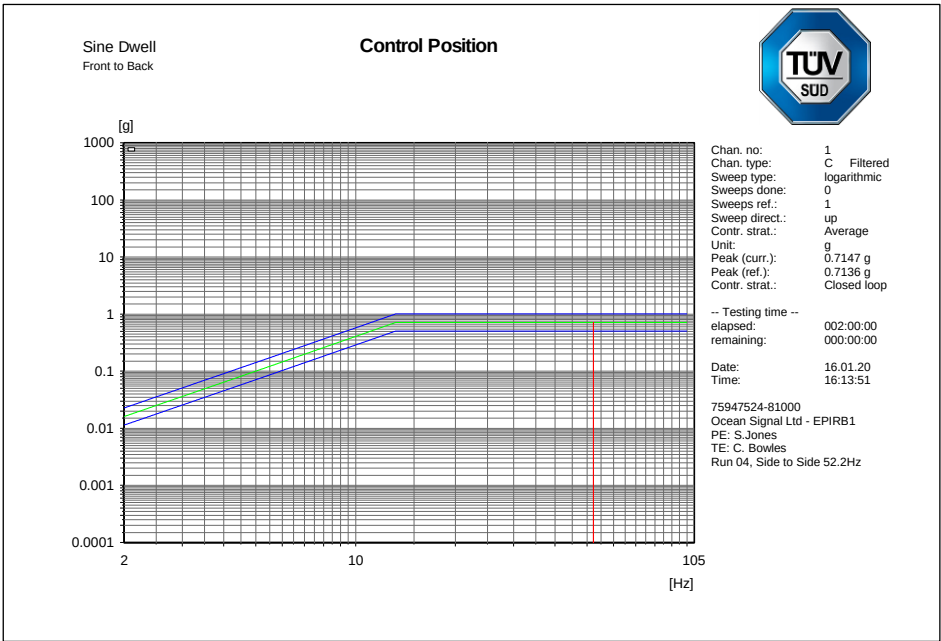
Side to Side Axis



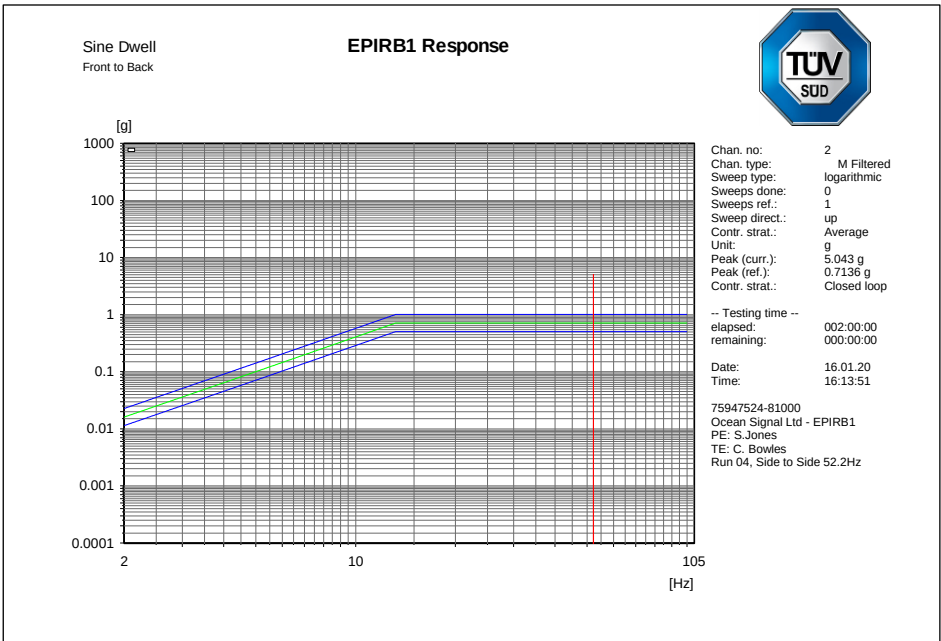
Resonant Search – Control Channel



Resonant Search – EPIRB1



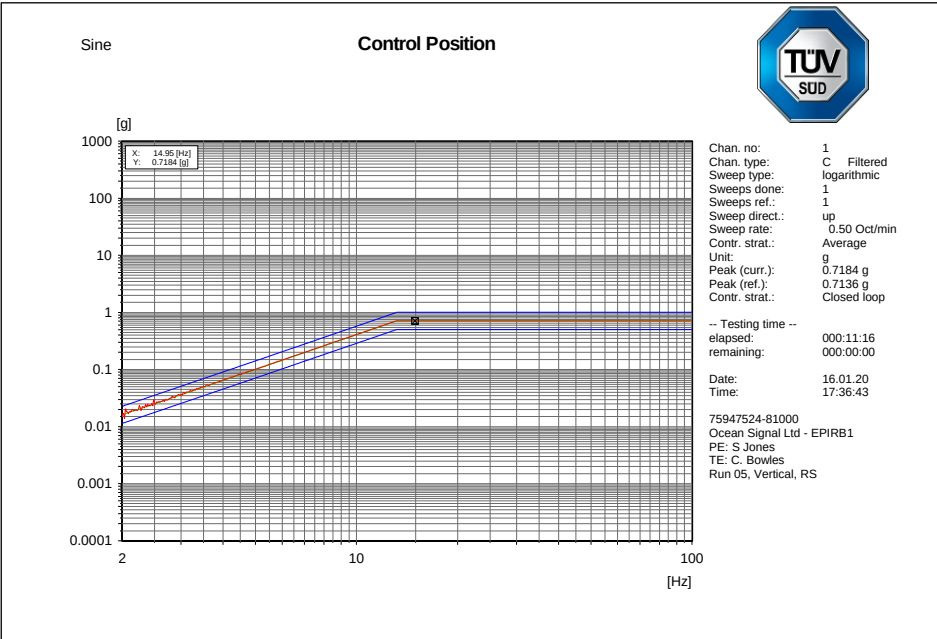
Endurance Run – Control Channel



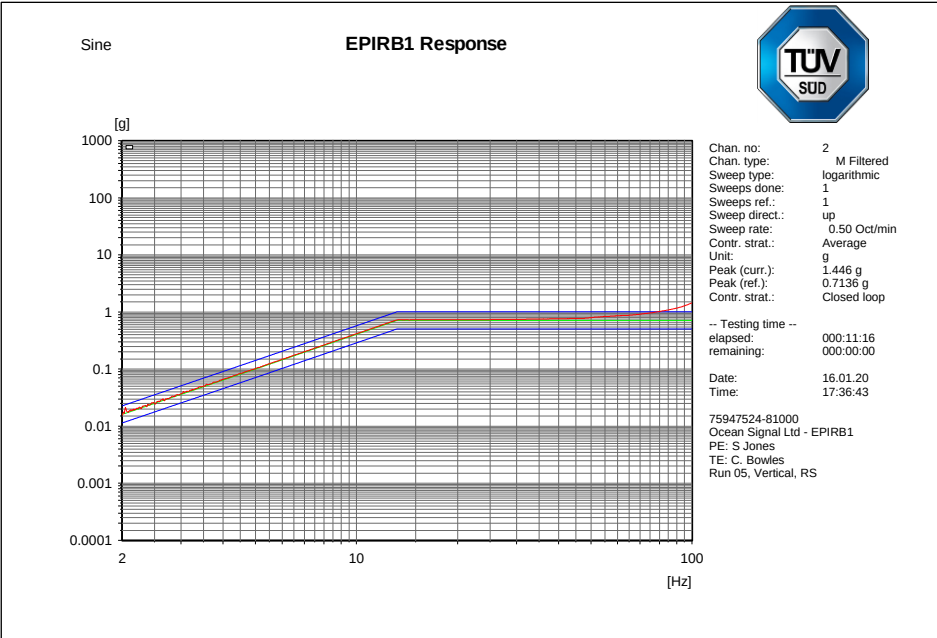
Endurance Run (52.2 Hz) – EPIRB1



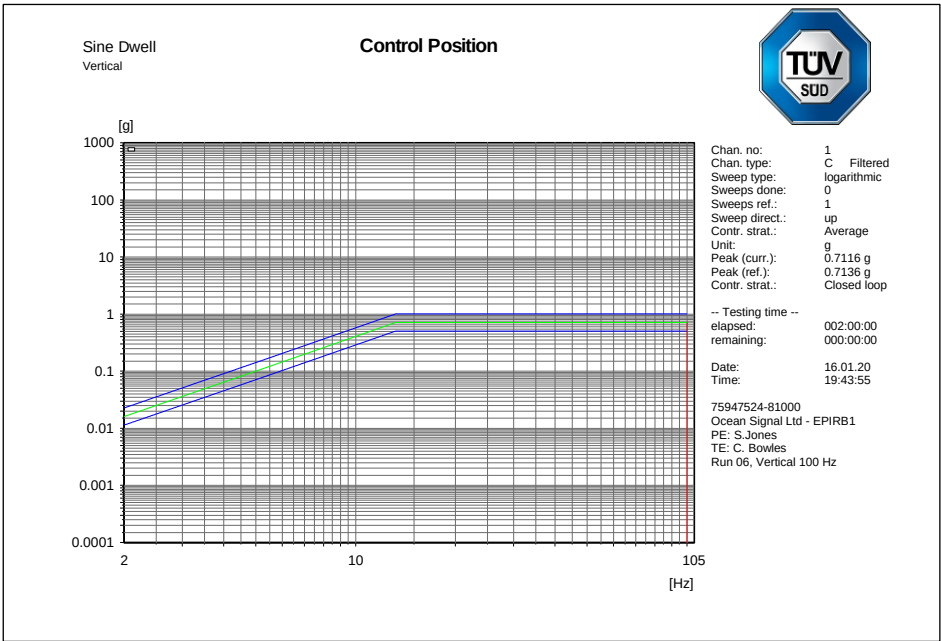
Z Axis



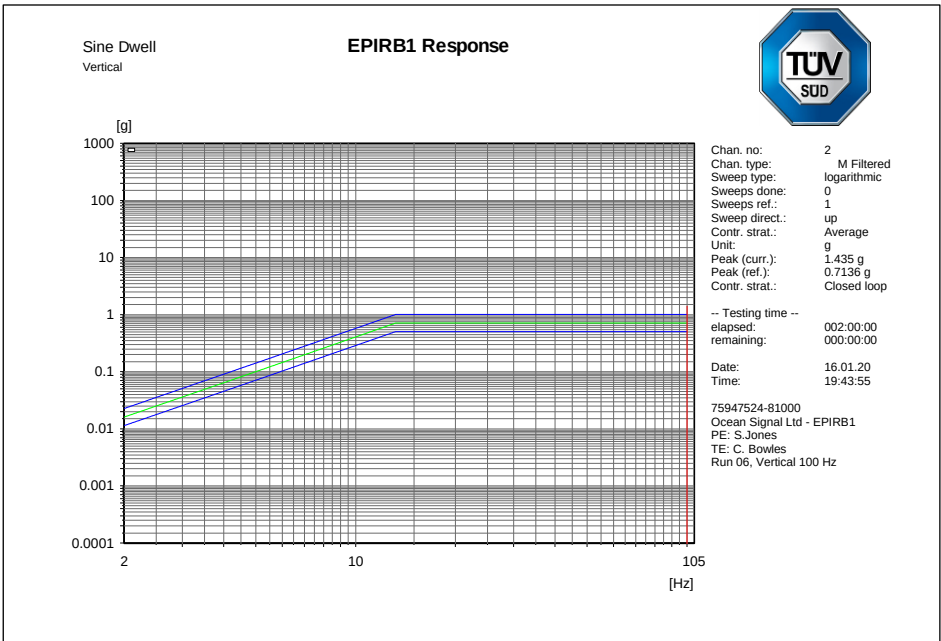
Resonant Search – Control Channel



Resonant Search – EPIRB1



Endurance Run – Control Channel



Endurance Run (100 Hz) – EPIRB1



Performance Checks

Parameter	Result
Self-test Mode:	
Self-test Message	FFFE08C9F00C05FC0FF06728BF79F3C0010
Normal Mode:	
Normal Message	FFFE2F8C9F00C05FC0FF06728BF79F3C0010
406 MHz Frequency	406.0401
121 MHz Presence	Y

Table 10 - Post Test Performance Check

2.4.7 Test Location and Test Equipment Used

This test was carried out in Climatic Areas

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Charge Amplifier	Endevco	133	2506	12	20-Jun-2020
Thermal Accelerometer	Endevco	256-10	3469	6	21-May-2020
Vibration & Shock Controller	m + p International	VibPilot VP8	3731	12	13-Sep-2020
Isotron Accelerometer	Endevco	256-10	3785	6	20-May-2020
Shaker	Ling Dynamic Systems	A340	4294	6	05-Mar-2020
Spectrum Analyser	Agilent Technologies	E7450A	1410	12	04-Oct-2020
Beacon Tester	WS Technologies	BT100S	4790	-	TU

Table 11

TU - Traceability Unscheduled

2.5 Ruggedness

2.5.1 Specification Reference

RTCM 11000.3, Clause A.7

2.5.2 Equipment Under Test and Modification State

EPIRB1, S/N: 0915139T– Modification State 0

2.5.3 Date of Test

16 January 2020 – 17 January 2020

2.5.4 Test Method

The EUT was fixed to the vibration table and subjected to the bump test according to the following profile:

Peak acceleration:	98 m/s ² +/-10 %
Pulse duration:	16 ms +/-10 %
Wave shape:	Half-cycle sinewave
Test Axis:	Vertical
Number of bumps:	4000

During the test a spectrum analyser and handheld beacon tester were set to monitor the EUT output to ensure that there were no unintentional transmissions. At the conclusion of the test, The EUT was subjected to a performance check. The EPIRB did not activate during this test.

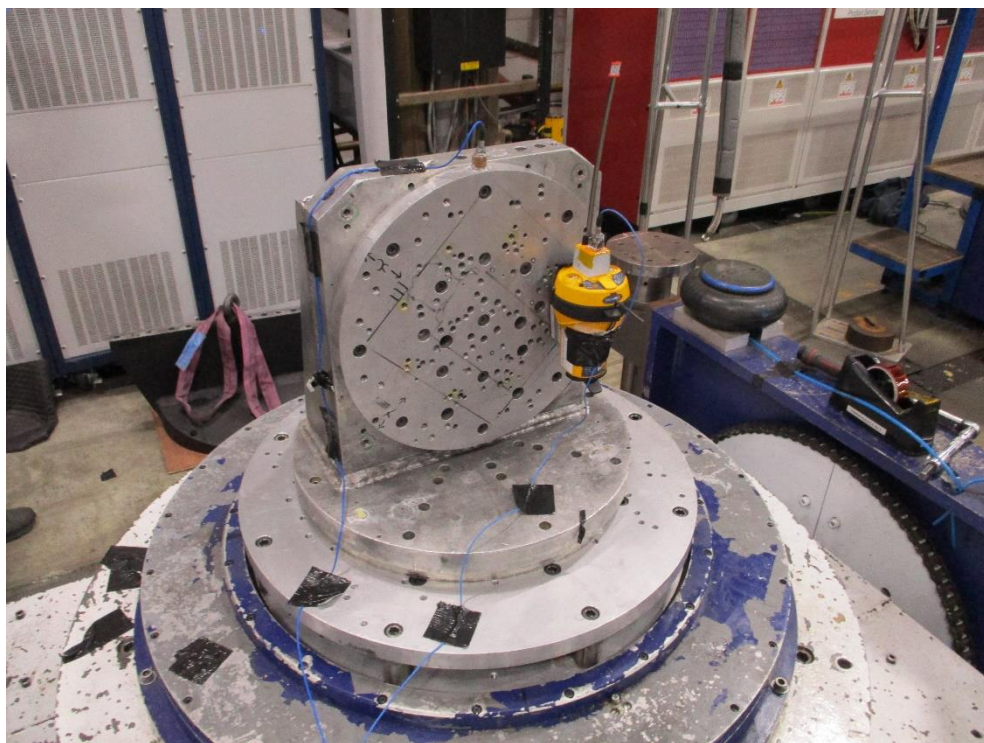
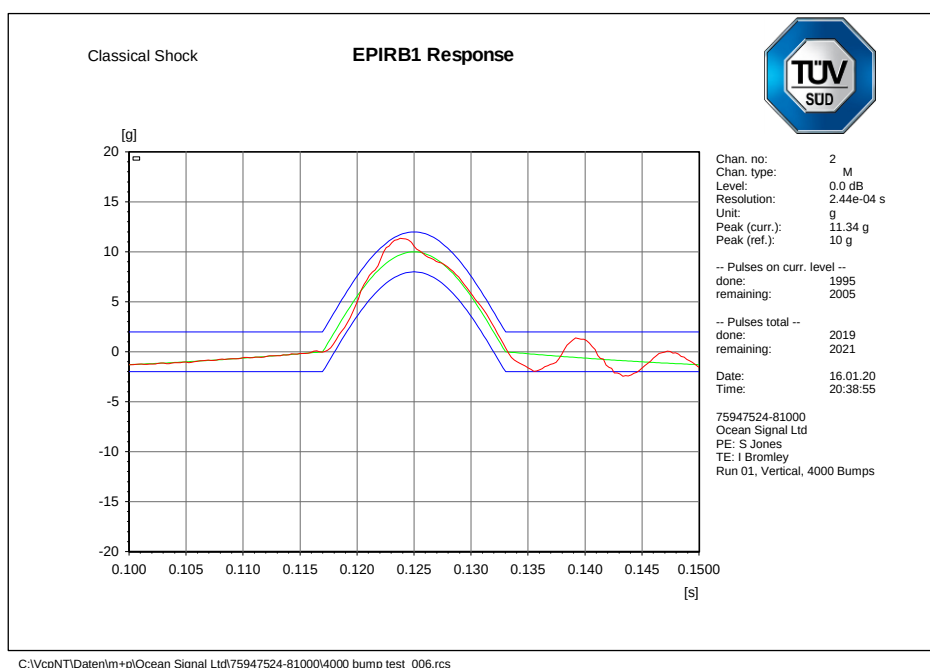
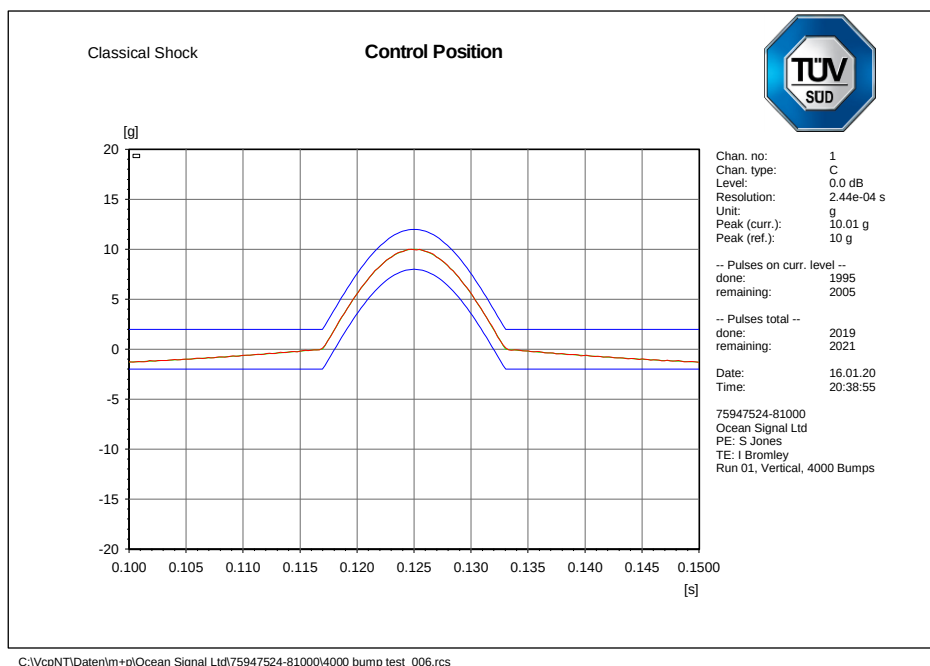


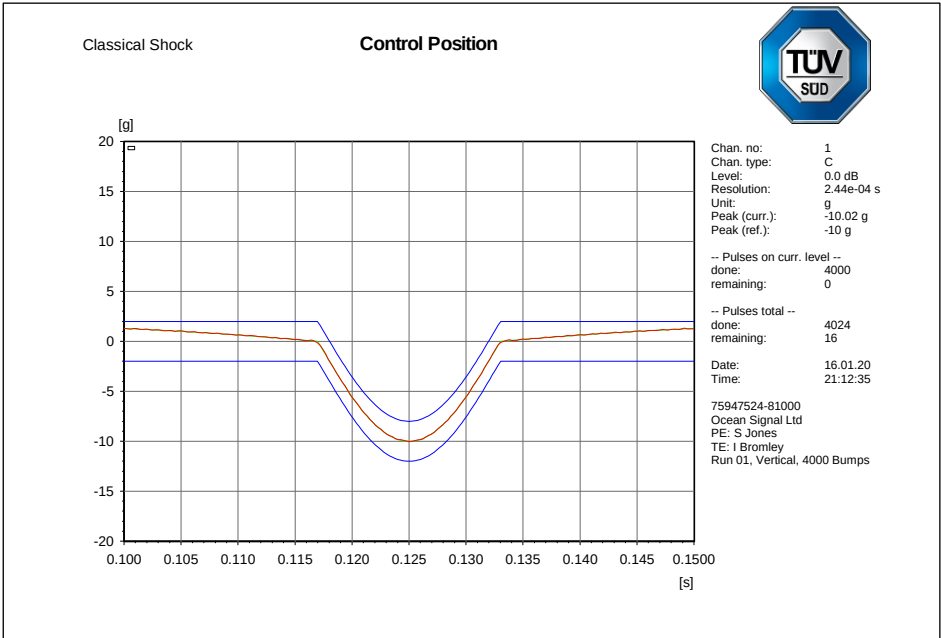
Figure 16 - Test Setup

Ambient Temperature	17.6 – 20.8°C
Relative Humidity	39.8 – 47.9%

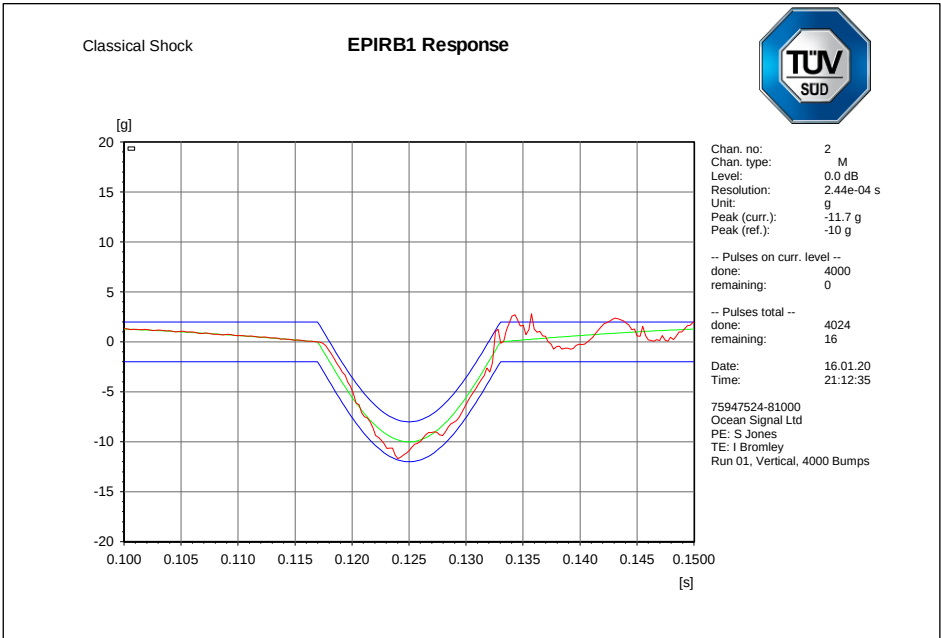




Positive – EPIRB1



Negative - Control



Negative - EPIRB1



Post Test Performance Check

Parameter	Result
Self-test Mode:	
Self-test Message	FFFED08C9F00C05FC0FF06728BF79F3C0010
Normal Mode:	
Normal Message	FFFE2F8C9F00C04CB5013CA76937852C0204
406 MHz Frequency	406.041
121 MHz Presence	Y

Table 12

2.5.7 Test Location and Test Equipment Used

This test was carried out in Climatic Areas

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Charge Amplifier	Endevco	133	2506	12	20-Jun-2020
Thermal Accelerometer	Endevco	256-10	3469	6	21-May-2020
Vibration & Shock Controller	m + p International	VibPilot VP8	3731	12	13-Sep-2020
Isotron Accelerometer	Endevco	256-10	3785	6	20-May-2020
Shaker	Ling Dynamic Systems	A340	4294	6	05-Mar-2020
Spectrum Analyser	Agilent Technologies	E7450A	1410	12	04-Oct-2020
Beacon Tester	WS Technologies	BT100S	4790	-	TU

Table 13

TU - Traceability Unscheduled

2.6 Annex D – Internal Navigation Device

2.6.1 Specification Reference

RTCM 11000.3, Clause Annex D

2.6.2 Equipment Under Test and Modification State

EPIRB1, S/N: 9240 – Modification State 0

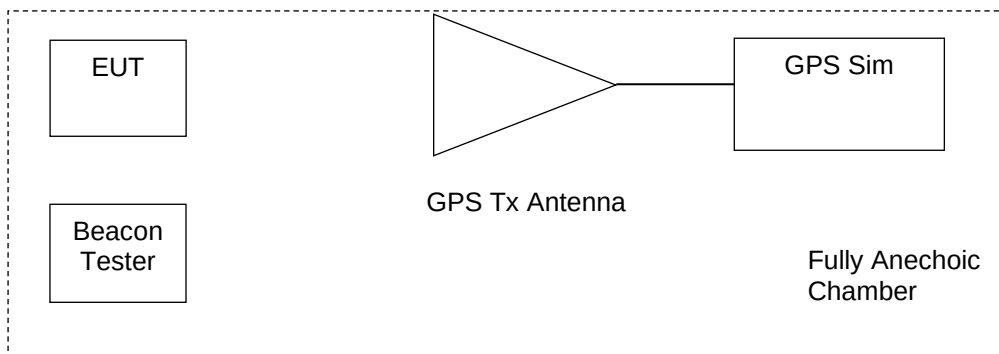
2.6.3 Date of Test

21 December 2019

2.6.4 Test Method

Each applicable scenario was run in accordance with Annex D of RTCM 11000.3 one after the other (the beacon being turned off in between scenarios to force it to 'Cold Start' each time). The Time To First Fix (TTFF) and transmitted location were recorded in each case. The results were then analysed and an assessment of the performance of the GNSS Receiver in the EPIRB under test was made.

Test Setup



2.6.5 Environmental Conditions

Ambient Temperature	22.5 °C
Relative Humidity	37.2 %



2.6.6 Test Results

Maritime Scenarios

Scenario #	TTFF (min: sec)	Simulator Location	Transmitted Location	Location Error (m)
1	02:33	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" E	0.00
2	00:55	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" E	0.00
3	N/A	0° 0' N, 0° 0' E	N/A	-
6	00:55	0° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 0" E	0.00
7	01:39	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
8	03:24	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
9	03:25	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
12	00:55	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 42" W	143.36
13	00:52	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 42" W	143.36
14	00:54	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 42" W	143.36
15	N/A	0° 0' N, 0° 0' E	N/A	-
16	04:15	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 0" W	0.00
17	03:34	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 0" W	0.00
18	01:45	80° 0' N, 0° 0' E	80° 0' 0" N, 0° 0' 0" W	0.00
19	N/A	0° 0' N, 0° 0' E	N/A	-
20	02:33	0° 0' N, 0° 0' E	0° 0' 42" S, 0° 0' 42" E	1834.05
21	N/A	0° 0' N, 0° 0' E	N/A	-
22	Fail	0° 0' N, 0° 0' E	Fail	-
24	01:42	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" E	0.00
25	N/A	0° 0' N, 0° 0' E	N/A	-
26	01:42	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
27	N/A	0° 0' N, 0° 0' E	N/A	-
28	02:33	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
30	Fail	0° 0' N, 0° 0' E	Fail	-
32	01:44	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00
33	Fail	0° 0' N, 0° 0' E	Fail	-
34	Fail	0° 0' N, 0° 0' E	Fail	-
35	Fail	0° 0' N, 0° 0' E	Fail	-
36	Fail	0° 0' N, 0° 0' E	Fail	-
37	00:55	44° 0' S, 175° 0' E	44° 3' 0" S, 174° 9' 0" E	0.00
38	01:42	47° 21' N, 8° 27' E	47° 21' 0" N, 8° 27' 0" W	0.00
39	00:55	0° 0' N, 0° 0' E	0° 0' 0" N, 0° 0' 0" W	0.00

Table 14

Note: Scenarios Labelled N/A were not included in the tests



Maritime Scenarios Results Analysis (D.4):

Criteria	Limit / Condition	Result
No. of Successful Tests	TTFF $\leq$ 13 minutes	20
Total No. of Maritime Scenarios	26	26
TTFF Percentage Success Rate	(No. Successful Tests / 26) $\times$ 100	80%
TTFF Pass / Fail Limit	$\geq$ 70%	Pass
No of Locations with Errors	$\leq$ 650 m	19
No of Scenarios with Locations	Enter result	20
Location Accuracy Percentage Pass Rate	(No Locations Errors $\leq$ 650 m / No Scenarios with Location) $\times$ 100	95%
Location Accuracy Pass / Fail Limit	$\geq$ 70%	Pass
		EPIRB Pass / Fail
Maritime TTFF Success Rate $\geq$ 70%		Pass
Maritime Location Accuracy Pass Rate $\geq$ 70%		Pass
Both results must be a "Pass" for the EPIRB to pass, any one or more "Fails" indicated failure		

Table 15 - Maritime Scenarios Results Analysis

2.6.7 Test Location and Test Equipment Used

This test was carried out in Climatic Area

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Directional Coupler	Narda	3022	503	-	O/P Mon
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	13-Nov-2020
Hygrometer	Rotronic	HP21	4740	12	17-Jan-2020
GPS Simulator	Spirent	GSS7000	4978	12	21-Jun-2020
Cable (18 GHz)	Rosenberger	LU7-036-1000	5028	12	06-Oct-2020
Cable (18GHz)	Rosenberger	LU7-036-2000	5038	-	O/P Mon

Table 16

O/P Mon – Output Monitored using Calibrated Equipment

3 Photographs

3.1 Equipment Under Test (EUT)

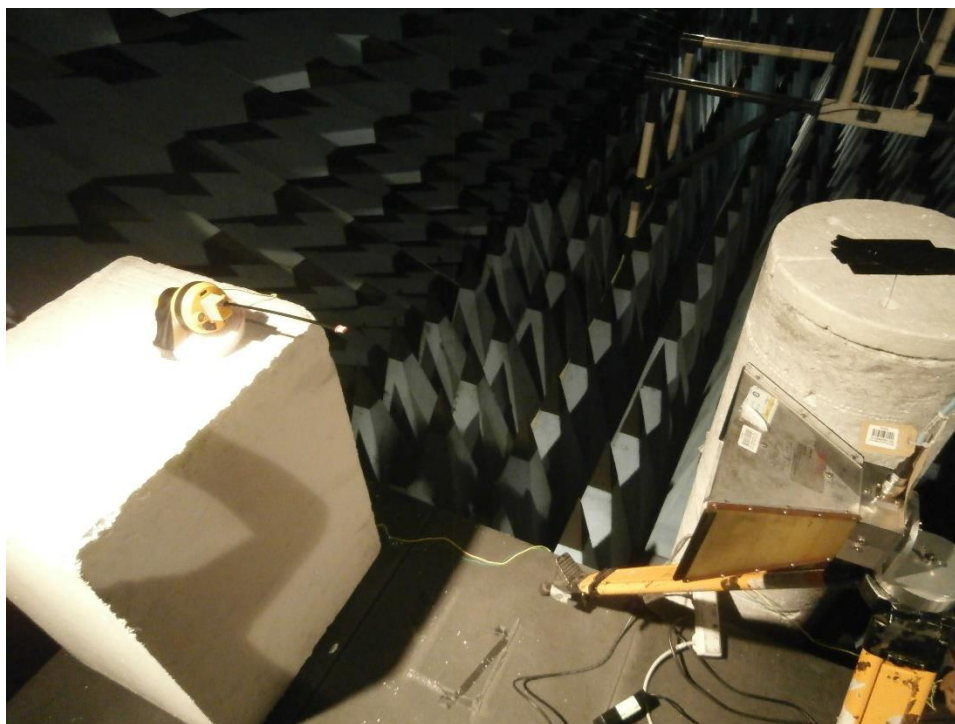


Figure 17 - Annex D – Maritime Scenarios Test Setup



4 Measurement Uncertainty

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4



ANNEX A

Manufacturer Supplied Data



Reference : EB195
Issue level : 1
Issue date : May 1996

ENGLISH BRAIDS LTD

Spring Lane, Malvern
Worcestershire WR14 1AL
England
Tel: +44(0) 1684 892 222
Fax: +44(0) 1684 892 111
Email: info@englishbraids.com
Web: www.englishbraids.com



PRODUCT DATA SHEET

Product type

Description	Braided polypropylene cord
Specification number	PK18
Issue number	2
Issue date	23-AUGUST-2002



Physical properties

Cover material type	Multifilament polypropylene.
Core material type	NONE
Construction	8 - plait
Specific gravity of cover material	0.9 gms / cm3
Melting point	170 degrees centigrade
Diameter	1.8 mm nominal
Pitch or lay length	7.1 mm
Weight per metre	1 grams
Runnage	1000 metres per kg
Tensile strength	50 Kg
Extension	n/a
Colour	White and colours to order
Notes	

Safety information

Polypropylene cords are not listed for the purposes of the COSHH regulations. They are considered to be "low hazard" and by analogy with related materials they are unlikely to cause harmful effects under normal conditions of use. Toxic gases will form upon combustion, any incineration should take place under approved controlled conditions.

This information is to the best of English Braids knowledge accurate and reliable, however no warranty or guarantee is made to its completeness. It remains the user's responsibility to satisfy themselves that the product is suitable for their particular use.

All testing is carried out in accordance with BS EN 919 : 1995 where applicable.

R CORDS

The R range of small cords is manufactured from high tenacity polyester using a 16 carrier braiding machine. The smooth construction allows for a product that runs smoothly through hardware ensuring that the product lifespan is maximised while delivering high break loads. The cords are frequently used within the window blind industry, however can be used for all general purpose small cord applications. Standard reel sizes are detailed although other options are available including pre-cut lengths.

Feature and Benefits

- Smooth construction • Good roundness
- Large colour range (1.4mm)
- Good longevity

Colour Range



Technical Information

	Core	Cover
Construction		16 Plait
Material	Polyester	Polyester
Specific gravity	1.38	1.38
Resistance to acid	Yes	Yes
Resistance to alkali	Yes	Yes
Resistance to UV	Yes	Yes
Resistance to heat	~230 C	~230 C

Specifications

	Diameter (mm)	Weight (kg/100m)	Breaking Load Av (kg)	Standard Length (m)	Pre-stretched	Center Core	Colour Range	Window Blind suitability guide				
								Roller	Vertical	Pleated	Venetian	Roman
R8	0.8	0.05	16	1000	N	N	L**			•		•
R10	1.0	0.07	20	1000	N	N	L**			•		•
R12	1.2	0.09	32	500	N	N	L**			•		•
R14	1.4	0.15	42	500	N	N	L**				•	
R14R	1.4	0.16	42	500	N	Y	Y				•	
R16	1.6	0.18	54	500	N	N	L**				•	
R17R	1.7	0.23	61	500	N	Y	L**				•	
R18	1.8	0.26	65	500	N	N	L**				•	
R20	2.0	0.30	91	500	N	N	Y		•		•	
R20C	2.0	0.32	96	500	N	N	L**		•			
R22CP	2.2	0.36	128	800	Y	Y	L**		•			
PR25C*	2.5	0.27	128	500	N	Y	L**		•			
R25	2.5	0.47		600	N	N	Y	•				
R32K	3.2	0.70		400	N	Y	Y					



ENGLISH BRAIDS LIMITED • SPRING LANE • MALVERN • WORCESTERSHIRE • WR14 1AL

Tel: +44 (0)1694 892222 • Fax: +44 (0)1694 892111 • Email: sales@englishbraids.com • www.englishbraids.com