

**FCC TYPE ACCEPTANCE
APPLICATION FOR:**



Pathfinder™ 3
Product No 2714

FCC ID B66ACR-SART-PF-3
TEST REPORT

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TEST REPORT ON

Type Acceptance of the

ACR ELECTRONICS SART SER # Proto1

In Accordance with FCC regulation Title 47 PART 80.1101 (edition 10-1-02) relevant section are:

B1

B6

C6i

C6ii

(Applicable standards: IMO A.604 (15), 19 Nov.1987,IMO A.694(17) 6 Nov. 1991,IEC-945 first edition 1988,CCIR 628-1 1990)

Support documents: RTCM paper 163-93/sc113-54

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I. GENERAL REQUIREMENT:

IMO A.694(17) Clause	Requirement	Method	Conformance
2.1	be capable of being easily activated by unskilled personnel	Visual Inspection	Yes
2.2	be fitted with a means to prevent inadvertent activation	Visual Inspection	Yes
2.3	be equipped with visual and audible means to indicate correct operation and to alert survivors to the fact that a radar has triggered the SART	Visual Inspection	Yes
2.4	be capable of manual activation and deactivation	Visual Inspection	Yes
2.5	be provided with an indication of the standby condition, i.e. activated but not triggered	Visual Inspection	Yes
2.9	be capable of floating	Visual Inspection	Yes
2.10	be equipped with a buoyant lanyard suitable for use as a tether, with a length of 10m	Visual Inspection	Yes
2.11	be not unduly affected by seawater or oil	Material Certificate	Appendix A
2.12	be resistant to deterioration in prolonged exposure to sunlight	Material Certificate	Appendix A
2.13	be of a highly visible yellow color on all surfaces where this will assist detection	Visual Inspection	Yes
2.14	have a smooth external construction to avoid damaging the survival craft	Visual Inspection	Yes
4.1	Brief operating instructions in English	Visual Inspection	Yes
4.2	Expiry date of the primary battery used (expiry date)	Visual Inspection	Yes

II. PERFORMANCE REQUIREMENTS:

IMO A. 697(17) Clause	Requirement	Conform ance	REF# , page #
2.2	Have sufficient battery capacity to operate in the stand-by condition for 96h and in addition, following the stand by period, to provide transponder transmission for 8h when being continuously interrogated with a pulse repetition of 1kHz	Yes	1,6
2.4	Installed antenna should be at least 1m above sea-level	Yes	2,6
2.5	The vertical polar diagram of the antenna and hydrodynamic characteristic of the device should permit SART to respond to search radars under heavy swell condition. The polar diagram of the antenna should be substantially omnidirectional in the horizontal plane. Horizontal polarization should be used for transition and reception	Yes	3,6
2.6	The SART should operate correctly when interrogated at a distance of up to at least 5 nautical miles by navigational radar complying with resolution A.477(xii) and A.222(vii), with antenna height of 15m. It should also operate at distance of up 30 nautical miles by an airborne radar with at least 10kW peak output power at a height of 3000 ft.	Yes	4,6

Method of measurement as in RTCM paper 163-93/sc113-54 (A10.11.1)

1. Battery capacity

Average Current in Standby	43mA
Average Current during interrogation	100mA
Lowest voltage for correct operation	5V

Test Condition	Initial Voltage	Voltage after 96Hr	Voltage after further 8h
Tem – 20 ° C	5.25	5.7V	5.5V
Tem 20 ° C	5.6	5.74	5.54
Tem +55 ° C	5.6	5.74	5.53

2. Antenna Height:

The unit comes with mounting pole that is $\geq 1.0\text{m}$

3. Antenna Characteristics

See appendix B

4. Range performance

See appendix C

III. TECHNICAL CHARACTERISTICS

Method of measurement as in RTCM paper 163-93/sc113-54

CCIR 628-1 CLAUSE	Characteristic	Conformance	Ref #, Page #
1	Frequency 9,200 - 9,500 MHz	yes	1,8
2	Polarization: horizontal	yes	2,8
3	Sweep rate: 5 us per 200 MHz nominal	yes	3,8
4	Response signal: 12 sweeps	yes	4,8
5	Form of sweep (sawtooth): forward sweep time: 7.5us +/- 1us; return sweep time: 0.4us +/- 0.1us. The response shall commence with a return sweep.	yes	5,8
6	Pulse emission: 100 us nominal	yes	6,8
7	E.I.R.P.: not less than 400 mW (equivalent to +26dBm)	yes	7,9
8	Effective receiver sensitivity: better than -50 dBm (equivalent to 0.1 mW/m ²)	yes	8,9
9	Duration of operation: 96h in stand-by condition followed by 8 h of transponder transmission while being continuously interrogated with a pulse repetition frequency of 1 KHz.	yes	9,9
11	Recovery time following excitation: 10us or less	yes	10,9
13	Delay between receipt of radar signal and start of transmission: 0.5us or less.	yes	11,9
14	Antenna vertical beamwidth: at least +/- 12.5 deg relative to the horizontal plane of the radar transponder	yes	12,9
15	Antenna azimuthal beamwidth: omnidirectional within +/- 2dB	yes	13,9
Note1	Receiver front end protection	yes	8,9

IV. TECHNICAL CHARACTERISTICS TEST RESULTS

Method of measurement as in RTCM paper 163-93/sc113-54

Ref 1:

FREQUENCY	MEASUREMENT	UNITS
High Frequency Limit	9533	MHz
Low Frequency Limit	9158	MHz

Ref 2:

See appendix: B

Ref 3:

See ref 1 and 4

Ref 4:

12 Sweeps

Ref 5:

SWEEP TIME	MEASUREMENT	UNITS
Time Forward	7.58	μ S
Time Reverse	0.44	μ S

Ref 6:

See ref 4 and 5

$(7.58+0.44)*12=\mu$ S

Ref 7:

EIRP	MEASUREMENT	UNITS
MAX	30.36	dBm
MIN	28.9	dBm

Ref 8:

Note1: See appendix D

SENSITIVITY	MEASUREMENT	UNITS
Test signal 1	50	dBm
Test signal 2	50	dBm

Ref 9:

See Performance requirement clause 2.2

Ref 10:

RECOVERY TIME	MEASUREMENT	UNITS
	10	μS

Ref 11:

DELAY TIME	MEASUREMENT	UNITS
	280	nS

Ref 12:

See appendix B

Ref 13:

See appendix B

V. ENVIRONMENTAL TESTS

IEC-945 CLAUSE	Requirement	Conformance	Ref #. Page #
8.6.2	be capable of withstanding without damage a drop from a height of 20m into water	yes	1,12
8.9.2	be watertight at a depth of 10m for at least 5min	yes	2,12
8.9.3	maintain watertightness when subjected to a thermal shock of 45°C under specified conditions of immersion	yes	3,12
8.2.2	Dry Heat Cycle: Operational Temperature of +55°C, & Storage Temperature of +65°C;	yes	4,12
8.4	Low Temperature Cycle: Operational Temperature of -20°C, & Storage Temperature of -30°C;	yes	5,13
8.3	Damp Heat test at a temperature limit of +40 °C with a relative humidity of 95 %.	yes	6,13
8.7.2	Vibration: The EUT shall be subjected to sinusoidal vertical vibration at all frequencies between: 2 Hz to 5 Hz and up to 13,2 Hz with an excursion of $\pm 1 \text{ mm} \pm 10 \%$ (7 m/s^2 maximum acceleration at 13,2 Hz); – above 13,2 Hz and up to 100 Hz with a constant maximum acceleration of 7 m/s^2 . The frequency sweep rate shall be slow enough to allow the detection of resonances in any part of the EUT. A resonance search shall be carried out throughout the test. If any resonance of the EUT has $Q \geq 5$ measured relative to the base of the vibration table, the EUT shall be subjected to a vibration endurance test at each resonant frequency at the vibration level specified in the test with a duration of 2 h. If no resonance with $Q \geq 5$ occurs, the endurance test shall be carried out at one single observed frequency. If no resonance occurred, the endurance test shall be carried out at a frequency of 30 Hz.	yes	7,13

Ref1 Clause 8.6.2:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref2 Clause 8.9.3:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref3 Clause 8.9.2:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref4 Clause 8.2.2:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref 5 Clause 8.4:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref 6 Clause 8.3:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref 7 Clause 8.7.2:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

VI. ELECTROMAGNETIC COMPATIBILITY

IEC-945 CLAUSE	REQUIRMENTS	Conformance	Ref#, Page #
9.3	Radiated Emissions: Freq Band 1: - 150 kHz – 300 kHz Limit 1: - 10 mV/m – 316 uV/m (80 dBµV/m – 52 dBµV/m). Freq Band 2: - 300 kHz – 30 MHz Limit 2: - 316 uV/m – 50 uV/m (52 dBµV/m – 34 dBµV/m). Freq Band 3: - 30 MHz – 1 GHz Limit 3: - 500 uV/m (54 dBµV/m) except for 156 MHz – 165 MHz 16 uV/m (24 dBµV/m)	Yes	1,14
10.4	Radiated Susceptibility. 10 V/m 80 MHz – 1 GHz Performance criterion A	Yes	2,14
10.9	Electrostatic Discharge. 6 kV contact, 8 kV air, Performance criterion B.	Yes	3,14

Ref 1 Clause 9.3

See appendix E

Ref 2 Clause 10.4:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

Ref 3 Clause 10.9:

Performance check: Output Power/Modulation

Output Power (dBm)	Modulation		
	Low Frq. 9.2GHz +0/-60Mhz	12 Sweeps	Hi Frq, 9.5Ghz +0/-60Mhz
>26	Yes	Yes	Yes

VII. CERTIFICATION OF TEST DATA

I CERTIFY THAT ALL OF THE MEASUREMENT AND DATA PRESENTED IN THIS REPORT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE

Irek Gora

Electrical Engineer II

VIII. TEST SETUP

ACR Test Fixture #168 is mini X band Radar Interrogator Its primary function is to interrogate the ACR Transponder and to collectively gather the data from device under the test and print out Pass Fail Condition. The test set's Hardware and software accomplishes this

IX. Equipment List:

- A) Small Anechoic Chamber
 - B) SART test fixture ACR# 166
 - C) Digital Storage oscilloscope TEK TDS 310
 - D) Microwave counter/power meter HP5347a
 - E) PC with test software
 - F) Standard Gain Horn 16.5 dB
 - G) National Instrument GPIB card
 - H) DAC card # CIO-DAC02
 - I) GPIB BNC cables as required
- Test block diagram see appendix F

X. APPENDICES

- A Material specification
- B Antenna characteristics
- C Range performance
- D Frond end protection
- E EMC test
- F Test setup block diagram

APENDIX A
MATERIAL SPECIFICATION

Standard (mold release/bluing)		Weather resistant grade (acquired SAE standard)			Weather resistant grade		Extrusion grade	Optical grade	Flame resistant grade	
LV-2225Y	LV-2250Y	L-1225ZL 100	L-1225Z 100	L-1250Z 100	LV-2225Z	LV-2250Z	L-1250ZW	AD-5503	LN-1250G	LN-2250Y
11	8	25	11	8	11	8	7	54	11	11
1200	1200	1200	1200	1200	1200	1200	1200	1200	1220	1200
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
88	88	88	88	88	88	88	88	89	Translucent	88
1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	—	1,585
2400	2400	2400	2400	2400	2400	2400	2400	2450	2400	2400
61	61	62	61	61	61	61	62	63	62	61
6	6	6	6	6	6	6	6	6	6	6
>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50
2350	2300	2400	2400	2350	2400	2350	2350	2400	2200	2350
92	91	95	94	93	94	93	93	95	90	92
NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
71	76	13	71	76	71	76	76	3	12	12
128	129	123	128	129	128	129	129	124	129	128
141	142	136	141	142	141	142	142	138	141	141
148	149	142	148	149	148	149	149	143	148	148
0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3	3	3	3	3	3	3	3	3	3	3
10	10	10	10	10	10	10	10	10	10	10
90	90	90	90	90	90	90	90	90	90	90
>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³	>1x10 ¹³
>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵	>1x10 ¹⁵
30	30	30	30	30	30	30	30	30	30	32
250	250	250	250	250	225	225	250	250	275	225
V-2 (0.38mm)	V-2 (0.38mm)	V-2 (0.40mm) HB (2.1mm)	V-2 (0.40mm) HB (1.9mm)	V-2 (0.40mm) HB (1.5mm)	V-2 (0.38mm)	V-2 (0.38mm)	V-2 (0.40mm) HB (1.5mm)	—	V-0 (1.0mm)	V-2 (0.43mm) V-0 (3.0mm)
125	125	125	125	125	125	125	125	—	125	125
115	115	115	115	115	115	115	115	—	115	115
125	125	125	125	125	125	125	125	—	125	125

Physical properties-general grades

Property	Unit	Test method	Measurement condition	Standard (mold release/bluing)				
				L-1225L	L-1225Y	L-1250Y	K-1300Y	LV-2225L
Melt volume flow rate	cm ³ /10min	ISO 1133	300°C load1.2kg	18	11	8	2.5	18
Density	kg/m ³	ISO 1183	—	1200	1200	1200	1200	1200
Water absorption rate	%	ISO 62	in water 23°C 24h	0.2	0.2	0.2	0.2	0.2
Light transmission	%	ASTM D1003	thickness 3mm	88	88	88	88	88
Refractive index	—	ASTM D542	—	1.585	1.585	1.585	1.585	1.585
Tensile modulus	MPa	ISO 527-1 and ISO 527-2	1mm/min	2400	2400	2400	2350	2400
Tensile yield stress	MPa		50mm/min	61	62	61	60	61
Tensile yield distortion	%		50mm/min	6	6	6	6	6
Tensile fracture designation distortion	%		50mm/min	>50	>50	>50	>50	>50
Flexural modulus	MPa	ISO 178	2mm/min	2350	2350	2300	2200	2350
Flexural strength	MPa		2mm/min	93	92	91	90	93
Charpy impact strength	kJ/m ²	ISO 179	unnotched	NB	NB	NB	NB	NB
			notched	67	71	76	89	67
Load-deflection temperature	°C	ISO 75-1 and ISO 75-2	1.80MPa	126	128	129	132	126
			0.45MPa	139	141	142	145	139
Vicat softening temperature	°C	ISO 306	50°C/h 50N	146	148	149	151	146
Mold shrinkage	%	In-house method	parallel	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
			vertical	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
Coefficient of linear expansion	×10 ⁻⁴ /°C	ISO 11359-2	parallel	0.7	0.7	0.7	0.7	0.7
			vertical	0.7	0.7	0.7	0.7	0.7
Specific inductive capacity	—	IEC 60250	100Hz	3.1	3.1	3.1	3.1	3.1
	—		1MHz	3	3	3	3	3
Dielectric loss tangent	×10 ⁻⁴	IEC 60250	100Hz	10	10	10	10	10
	×10 ⁻⁴		1MHz	90	90	90	90	90
Volume resistivity	Ω·m	IEC 60093	—	>1×10 ¹³	>1×10 ¹³	>1×10 ¹³	>1×10 ¹³	>1×10 ¹³
Surface resistivity	Ω	IEC 60093	—	>1×10 ¹⁵	>1×10 ¹⁵	>1×10 ¹⁵	>1×10 ¹⁵	>1×10 ¹⁵
Withstand voltage	MV/m	IEC 60243-1	short time test	30	30	30	30	30
Tracking resistance	—	IEC 60112	—	250	250	250	250	250
Heat durability	—	UL 94	—	V-2 (0.40mm)	V-2 (0.40mm)	V-2 (0.40mm)	HB (0.38mm)	V-2 (0.38mm)
			—	HB (3.05mm)	HB (1.9mm)	HB (1.5mm)	—	—
Temperature index	°C	UL 746B	electric 1.47mmt	125	125	125	125	125
			impact 1.47mmt	115	115	115	115	115
			non-impact 1.47mmt	125	125	125	125	125

The values listed are specification values, not certified values.

1) Temperature index of LN-2250Y is provided under the thickness of 3.0mm.

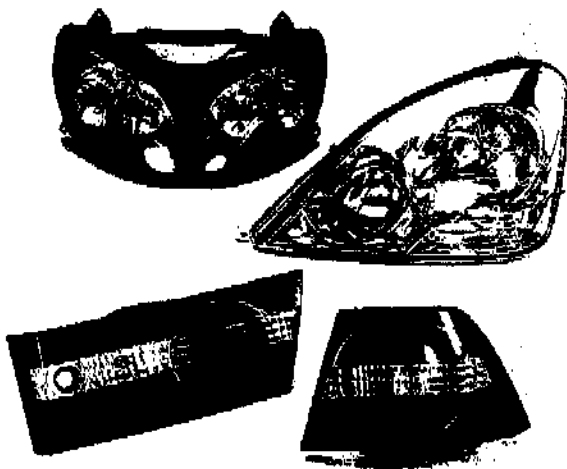
Panlite® L-1225Z 100

Automotive & Motorcycle Headlamp Lens Applications Grade

Panlite® L-1225Z 100 is a polycarbonate grade widely used in the manufacture of headlamp lenses for automobiles and motorcycles, where its superior impact strength, transparency, heat and weather resistance are highly valued.

- ◆ Compared to glass or acrylic resin materials, **Panlite®** L-1225Z 100 maintains high impact strength over a wide range of temperatures, giving it advanced safety properties.
- ◆ Its exceptional lightness is an aid to improving fuel economy, and also allows for great freedom of design.
- ◆ With reduced gas generation during molding, copying from the mold is improved.
- ◆ Anti-weathering properties mean that discoloration over time is kept to a minimum.

CATEGORY	CONDITION	STANDARD	UNIT	L-1225Z 100
Specific Gravity	—	ISO 1183	—	1,200
Light transmission	3mm thick	ASTM D1003	%	88
Refractive index	—	ASTM D542	—	1.585
Tensile Strength	—	ISO 527-1, 2	MPa	61
Flexural Strength	—	ISO 178	MPa	94
Flexural Modulus	—	ISO 178	MPa	2,400
Impact Strength	Charpy Notch, 3.2t	ISO 179-1b2	kJ/m ²	71
Heat Distortion Temp	1.80MPa	ISO 75-1, 2	°C	128
MVR	300°C, Load 1.2kg	ISO 1133	cm ³ /10min	11



Safety Considerations

Material Safety Data Sheets for Dow Polypropylene resins are available from the Dow sales offices to help customers further satisfy their own safe handling and disposal needs. Such information should be requested from the supplier(s) of any product(s) prior to working with it (them). The comments that follow are pertinent only to the resins discussed, as supplied. Various additives and processing aids used in fabrication will have their own safe use profile and must be investigated separately.

Health and Safety

Polypropylene resins are among the most inert commercial polymers and constitute no hazard in normal handling. For "Regulated" uses, such as food contact, your Dow sales representative can obtain compliance letters for specific resins. Normal good housekeeping practices should be followed. Workers should be protected from possibility of skin or eye contact with molten polymer. Safety glasses are suggested as a minimal precaution to prevent possible mechanical or thermal injury to the eyes. Fabrication areas should be ventilated to carry away fumes or vapours; workers should be assured of supply of fresh air. Workplace environments should be kept clean and free of dust.

Combustibility

Polypropylene resins will burn when supplied with adequate amounts of heat and oxygen. They should be handled and

stored away from contact with direct flames and/or other ignition sources. In burning, polypropylene resins contribute high heat and may generate a dense black smoke. Fires can be extinguished by conventional means with water fog preferred. In enclosed areas, fire fighters should be provided with self-contained breathing apparatus.

Recycling

Polypropylene resins can be recycled. Production rejects and/or conversion waste should preferably be recycled instead of being disposed of.

Disposal

In disposal of any wastes, be certain all applicable national and local regulations are met. If these regulations are met, the following is applicable for the polypropylene resins as supplied. If fillers, processing aids or other materials have been added, their possible influence on handling and disposal should be judged separately. Polypropylene resins can be disposed of either by incineration or landfill. With properly controlled industrial, commercial or municipal incineration, particulate or gaseous discharge into the air can be maintained within allowable levels. Thermoplastic products, such as polypropylene resins, have high heat values and should be incinerated only in units designed to handle high heats of combustion. In landfill, polypropylene resins are inert, do not degrade quickly, form a strong and permanent soil base, and evolve

virtually no gases or leachates known to pollute water resources.

Product Stewardship

The Dow Chemical Company has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the health and environmental information on our products and take appropriate steps to protect employee and public health, and our environment. Our Product Stewardship programme rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale and disposal of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to help ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel will assist customers in dealing with ecological and product safety considerations. Dow product literature, including Safety Data Sheets, should be consulted prior to use of Dow products. These are available from the nearest Dow sales office. For further information contact the Dow Information Centre Amsterdam, The Netherlands; please call +31 20 691 6266 or fax +31 20 691 6416.

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Dow Plastics

We don't succeed unless you do.

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PRELIMINARY DATA SHEET



DR 700.00 (DP 832)

Product Description

DR 700.00 is a clarified high flow random copolymer designed for thin wall injection moulding. It is produced via controlled rheology and has relatively good impact strength and flexibility whilst having excellent flow properties

PROPERTY	TEST METHOD	TEST SPECIMEN	VALUE
Melt Flow Rate (230°C, 2.18kg), g/10min	ISO 1133	granules	25
Density, g/cm ³	ISO 1183	10mm x 10mm x 4mm	0.900
Flexural Modulus	ISO 178	Injection Moulded	960
Notched Impact Strength (23°C), kJ/m ²	ISO 179/1eA	80mm x 10mm x 4mm	5

See "Handling Considerations" reverse side K.

Dow Plastics is a business group of The Dow Chemical Company and its subsidiaries.

APENDIX B
ANTENNA CHARACTERISTIC



BABT, Segensworth Road, Titchfield
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www.tuvps.co.uk



TEST HOUSE DECLARATION

We, TUV Product Service Limited of Segensworth Road, Fareham, Hampshire PO15 5RH, declare under our sole responsibility that the product :

Equipment : Search and Rescue Transponder
Model : TelluSART MK II
Serial Number : Proto 7
Quantity : One

to which this declaration relates is in conformity with the following standard(s) or other normative document(s) :

IEC 1097-1 (1992-07)
Clause 6.9.6, Antenna Characteristics

This declaration applies only to the particular sample of the product tested.

Detailed results will be recorded in Test Report No. RM611145

Place and date of issue : Fareham, August 2003

Signature :

M JENKINS
Wireless Group Leader

Date :

7th August 2003



0141
Group

APENDIX C
RANGE PERFORMANCE

Certificate of Test



SART RANGE TEST

Certificate number: QinetiQ/S&E/ MATS/R/TT 10/03-2
 Date of issue: 11th July 2003
 Issue: 1.0

QinetiQ
 Fraser Range
 Fort Cumberland Road
 Eastney, Portsmouth
 Hampshire PO4 9LJ UK
 Telephone: 02392 334509
 Facsimile: 02392 334519

Customer:	TUV Product Services Ltd
Customer Representative:	Mrs M Hardy
Equipment under test:	Search & Rescue Transponder (SART)
Build Standard:	Production units
Power supply:	Battery powered
Test specifications:	BS EN 61097-1 Clause 3.7 Range Performance
Test dates:	10 th July 2003
Time	14:55 (BST)
Modes of operation:	Equipment in active mode
Test witnessed by	R Sharp/ M Blackwell
Test House Supervisor:	R Sharp
Location of Testing:	Radar sited at Fraser Range Portsmouth. SART deployed at Bracklesham Bay
Radar Details	Kelvin Hughes Nucleus 2 6000 25kW X- Band
Separation	7nm

Test Item Details

Manufacturer	Type	Serial No
ACR Electronics	TellUSART MK III	Proto 6

Environmental Conditions

Sea state	Visibility	Tide
1-2	5nm	Low

Test Results Summary

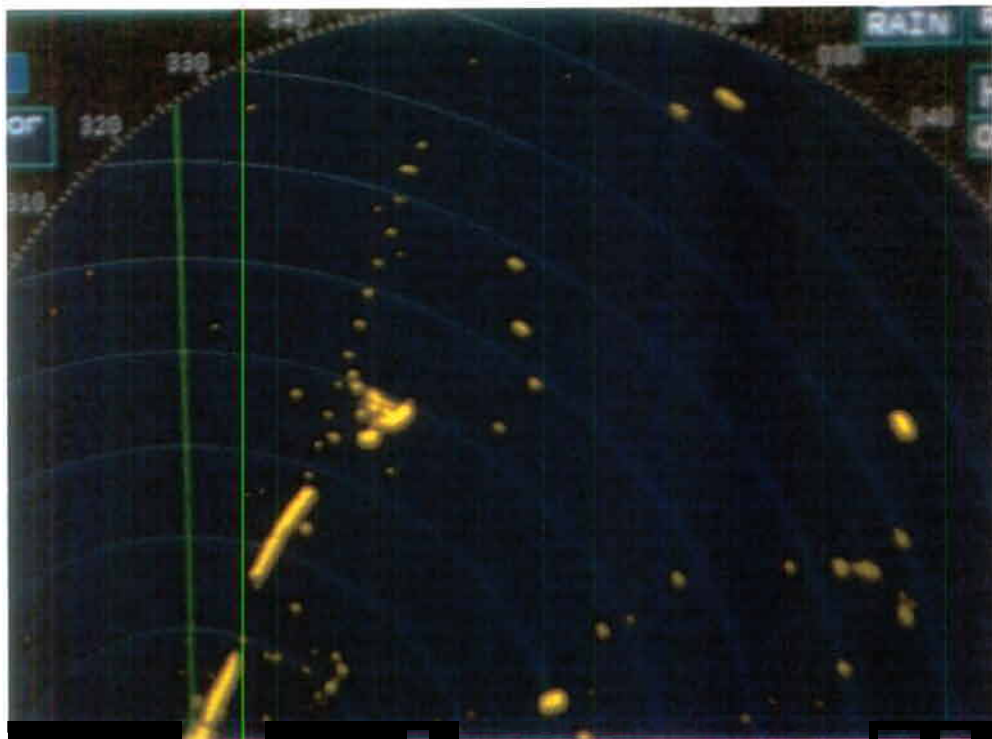
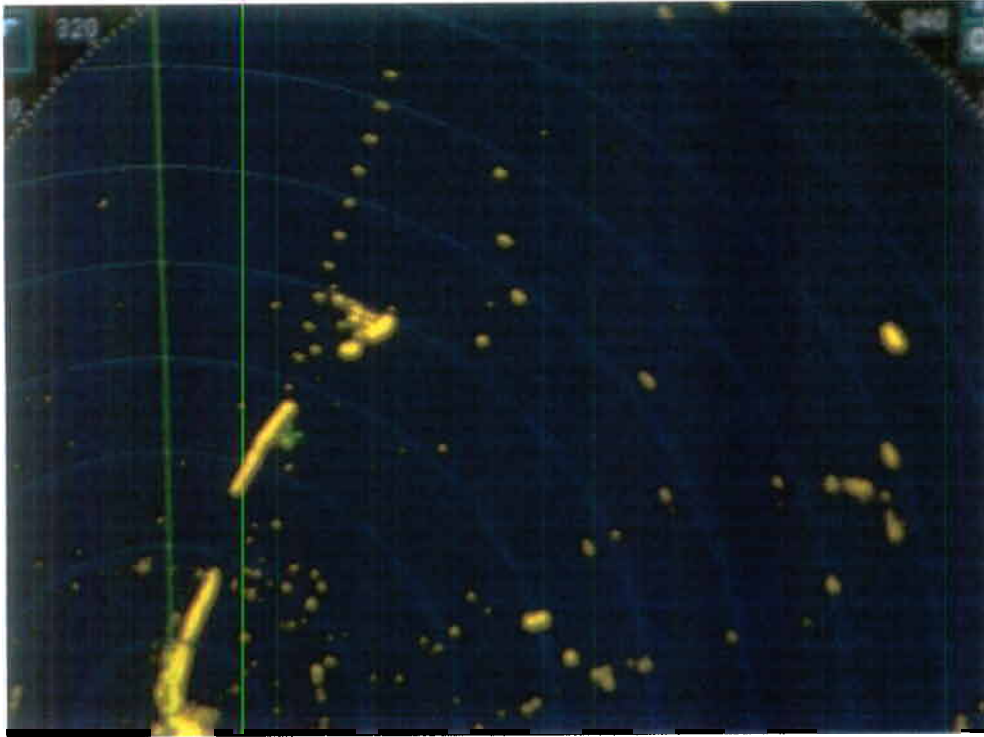
Test
<p>The SART response was tested as defined in the specification indicated, with an X-Band Marine Radar meeting IMO resolution A477(XII)</p> <p>The test was conducted with the SART positioned at the waters edge with the lowest part of the antenna set at 1 metre above the surface of the sea, and in line of sight to the Radar antenna at Fraser Range over a sea path. The Radar was detuned to reduce land returns and enhance the SART response. The resultant display was photographed.</p> <p><u>Result</u> SART performance observed as satisfactory.</p>

IT IS CERTIFIED THAT THE TESTS DETAILED IN THIS CERTIFICATE HAVE BEEN CARRIED OUT AS SPECIFIED, WITH THE RESULTS AS SHOWN, TO THE REQUIREMENTS OF THE CONTRACT.

Signed

Date 11th July 2003

PICTURES OF tellUSART SART RESPONSE



APENDIX D

FRONT END PROTECTION

The antenna maximum gain is 7dbi or 5.01 at 9.5Ghz this gives an effective aperture for the antenna of $A_e = \lambda^2 G / 4\pi = (1.26)^2 (5.01) / 4\pi = .633 \text{in}^2 = 4.08 \times 10^{-4} \text{m}^2$

When placed in RF field with a power density of 28dBW/ m² or 631W// m²

This implies a power at the receiver front end of $631 * 4.08 \times 10^{-4} = .26 \text{W}$

The receiver module was tested with direct 1 W signal. Which is greater then the maximum power calculated above

APENDIX E
EMC TEST



Department of Communications

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Private Bag X860, Pretoria, 0001
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Fax +(27-(0)12) 427-8086

Electromagnetic Compatibility

Test Report

for the

SART 3

PREPARED FOR : ACR SA
PREPARED BY : DEPARTMENT OF COMMUNICATIONS
INSTITUTE FOR SATELLITE AND SOFTWARE APPLICATIONS
CONTRACT NO. :
DATE : July, 2003
DOCUMENT NO. : 9304- 07-03