Concorde Battery Corporation

2009 San Bernardino Road
West Covina, California, USA 91790

RG-616

24 VOLT 6.0 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

RTCA DO-293A and IEC60952

Applications: Emergency Power

NOTE: Applications may not be a complete list of all applications for this battery type.

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Description	The RG-616 is a 24 volt valve regulated lead acid battery designed for emergency power. The RG-616 battery consists of 12 standard 2 volt cells connected in series with the use of a circuit board. These cells are housed within an aluminum case and cover. High retention rivets are used to join the container and cover. The RG-616 is fitted with a circular style receptacle along with a vent tube and perforated vent area incorporated into the outer housing. The electrolyte is a sulfuric acid and water solution and is absorbed within the battery plates and separators. There is no free electrolyte. See Material Safety Data Sheet for hazardous material identification and precautions.		
Format	IEC 60952-2	Concorde Drawing No. RG-616	
Connector	IEC 60952-2	Each battery is equipped with a MIL style circular connector.	
Mass	IEC 60952-2	RG-616 - 7.6 Kg (16.7 lbs) Max	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 VDC ± 0.25 VDC	
Any auxiliary requirement:	N/A	None	
Ventilation	DO-293A, 2.2.2	The RG-616 is equipped with vent tubes.	
Flammability	IEC 60952-1, 6.13	The RG-616 outer container and cover are fire resistant.	
Unspillability		Non spill	
Electrical Performance			
Rated Capacity (C_1)	DO-293A, 2.2.2 IEC 60952-1, 5.1.1	6 Ah	
Capacity at –18°C	DO-293A, 2.2.3 IEC 60952-1, 5.1.2	3.8 Ah	
Capacity at –30°C	DO-293A, 2.2.4 IEC 60952-1, 5.1.3	3.0 Ah	
Capacity at +50°C	DO-293A, 2.2.5 IEC 60952-1, 5.1.4	6.0 Ah	
Power Rating +23°C	DO-293A, 2.2.6.1 IEC 60952-1, 5.2.2.1	N/A, for engine starting batteries only	
Power Rating -18°C	DO-293A, 2.2.6.2 IEC 60952-1, 5.2.2.2	N/A, for engine starting batteries only	
Power Rating -30°C	DO-293A, 2.2.6.3 IEC 60952-1, 5.2.2.3	N/A, for engine starting batteries only	
Rapid Discharge Capacity at 23°C	DO-293A, 2.3.1 IEC 60952-1, 5.3.1	3.5 Ah	
Rapid Discharge Capacity at -30°C	DO-293A, 2.3.2 IEC 60952-1, 5.3.2	1.5 Ah	
Charge Retention	DO-293A, 2.4 IEC 60952-1, 5.4	23°C - Rating value for design = 90 % 50°C - Rating value for design = 65 %	
Storage	DO-293A, 2.5 IEC 60952-1, 5.5	Testing in progress.	

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Charge Stability	DO-293A, 2.6 IEC 60952-1, 5.6, Class I	OK. Max battery temperature on charge = 49˚C. Charge current fell during the entire charge period. Capacity at end of test was greater than the C_1 rating.	
Short-circuit Current	DO-293A, 2.7 IEC 60952-1, 5.7	Battery met all test requirements: Peak current: 605 A Last current: 229 A at 8 sec	
Charge Acceptance	DO-293A, 2.8 IEC 60952-1, 5.8	+23˚C = 95 %	
		-18˚C (battery with heaters only) N/A	
		-40˚C (battery with heaters only) N/A	
Insulation Resistance	DO-293A, 2.9.1 IEC 60952-1, 5.9.1	The RG-616 successfully met the test requirements	
Dielectric Strength	DO-293A, 2.9.2 IEC 60952-1, 5.9.2	The RG-616 successfully met the test requirements	
Duty Cycle Performance	DO-293A, 2.10 IEC 60952-1, 5.10	N/A	
Water Consumption	DO-293A, 2.11 IEC 60952-1, 5.11	N/A	
Overcharge Endurance	DO-293A, no requirement IEC 60952-1, 5.12	Not Tested	
Cyclic Endurance	DO-293A, 2.12 IEC 60952-1, 5.13	100 cycles successfully completed.	
Deep Discharge	DO-293A, 2.13 IEC 60952-1, 5.14	Capacity after Deep Discharge Test: 6.36 Ah (106 % of the rated C_1 capacity)	
Induced Destructive Overcharge	DO-293A, 2.14 IEC 60952-1, 5.15	All test requirements were successfully met.	
Electrical Emissions	DO-293A, 2.15 IEC 60952-1, 5.16	N/A, battery contains no active electronics.	
Environmental Performance			
Vibration	DO-293A, 3.1 IEC 60952-1, 6.1	Qualified per DO-293A to DO-160G Section 8, Random Vibration test, Curve C, 1 hr per axis.	
Acceleration	DO-293A, no requirement IEC 60952-1, 6.2	Not tested	
Operational Shock	DO-293A, 3.3.1 IEC 60952-1, 6.3, Class I	Qualified per DO-293A to DO-160G, Category B.	
Crash Safety Shock	DO-293A, 3.3.2 IEC 60952-1, 6.3	Qualified per DO-293A to DO-160G, Category B . Sustained shocks were performed at an acceleration of 20g's in each direction.	
Explosion Containment	DO-293A, 3.4 IEC 60952-1, 6.4	Qualified to DO-293A. All test requirements were met.	
Altitude	DO-293A, 3.5 IEC 60952-1, 6.6	Qualified to 20,621m (67,654 ft) in accordance with DO-293A.	
Rapid Decompression	DO-293A, 3.5.2 IEC 60952 no requirement	Qualified from 2,300m (8,000 ft) to 20,621m (67,654 ft) in accordance with DO-293A.	

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Temperature Shock	DO-293A, 3.6 IEC 60952-1, 6.7	Qualified to testing at +85˚C to -55˚C in accordance with DO-293A.	
Fungus Resistance	DO-293A, 3.7 IEC 60952-1, 6.8	Component test. All components have been tested and qualified per DO-293A to DO-160G Category F.	
Humidity	DO-293A, 3.8 IEC 60952-1, 6.9	Qualified per DO-293A to DO-160G, Category B.	
Fluid Contamination	DO-293A, 3.9 IEC 60952-1, 6.10	Component Test: Test was performed on representative material samples. All samples successfully met the test requirement. ***Fluids tested:*** Fuels. Aviation Jet A fuel Aviation piston engine fuel (100LL AVGAS) Hydraulic fluids Mineral based (MIL-H-5606) Non-mineral based synthetic (MIL-PRF-83282 and MIL-PRF-87257) Lubricating oils Mineral based (MIL-L-6081) Ester based synthetic (MIL-L-23699) Internal combustion engine SAE 15W40 Solvents and cleaning fluids Isopropyl alcohol (TT-I-735) Denatured alcohol De-icing fluid Ethylene Glycol Propylene Glycol AMS 1424 (SAE AEA Type I) AMS 1428 (SAE AEA Type II) Insecticides - none Sullage - none Disinfectants (heavy duty phenolics) - none Coolant dielectric fluid - none Fire extinguishants - none	
Salt Spray	DO-293A, 3.10 IEC 60952-1, 6.11	Qualified per DO-293A to DO-160G, Category S.	
Physical Integrity at High Temperature	DO-293A, 3.11 IEC 60952-1, 6.12	Qualified to DO-293A.	
Flammability	DO-293A, 3.12 IEC 60952-1, 6.13	Not tested.	
Electrolyte Resistance	DO-293A, 3.13 IEC 60952-1, 6.14	Component test. All components successfully met the test requirements.	
Thermal Sensors	DO-293A, 3.13 IEC 60952-1, 6.15	N/A	

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Component Qualification tests	DO-293A, 3.14 IEC 60952-1, 6.16	Component test. All components successfully met the test requirements.	
Battery Airtightness	DO-293A, no requirement IEC 60952-1, 6.17	N/A	
Cell Baffle	DO-293A, no requirement IEC 60952-1, 6.18	N/A, applies only to nickel-cadmium batteries only.	
Strength of Receptacle	DO-293A, 3.15 IEC 60952-1, 6.19	Qualified to DO-293A	
Handle Strength	DO-293A, 3.16 IEC 60952-1, 6.20	Qualified to DO-293A	

N/A = Not Applicable

Authentication:

Manufacturer. Concorde Battery Corporation.

Signed: John B. Timmons, PE .....

Digitally signed by John B. Timmons, PE
DN: cn=John B. Timmons, PE, o=Concorde Battery Corporation, ou=Vice President Engineering, email=jtimmons@concordebattery.com, c=US
Reason: I am approving this document
Date: 2013.11.14 11:45:18 -05'00'

Name of signatory: John B. Timmons, PE

Title or Function: Vice President Engineering