Concorde Battery Corporation

2009 San Bernardino Road
West Covina, California, USA 91790

RG-325

24 VOLT, 25 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

RTCA DO-293 and IEC 60952-1

Applications: Engine Starting and Emergency Power
NOTE: Applications may not be a complete list of all applications for this battery type.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export-controlled information

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance	Test Report / Reference
Description	The RG-325 is a 24 volt valve regulated lead-acid aircraft battery designed for engine starting and emergency power. The battery consists of twelve 2 volt cells connected in series. The battery is constructed of a one piece plastic container and cover which are secured together with an epoxy cement. The container and cover are made of high-impact polypropylene. The battery hold down attachment points and handle assembly are incorporated into the cover. The RG-325 is fitted with internal M8 female thread connectors. The electrolyte is a sulfuric acid and water solution and is absorbed within the battery plates and separators. There is no free electrolyte.		
Format	IEC 60952-2	Concorde Drawing No. RG-325	
Connector	IEC 60952-2	The battery is available with internal M8 female threaded connectors.	
Mass		23.6 kg Max (52 lbs).	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 V	
Any auxiliary requirement:		None	
Ventilation	DO-293, 1.9 IEC 60952-2	None	
Flammability	IEC 60952-2	Flammable	
Spillability		Non spill	
Electrical Performance			
Rated Capacity (C1)	DO-293, 2.2.2 IEC 60952-1, 5.1.1	25 Ah	
Capacity at –18°C	DO-293, 2.2.3 IEC 60952-1, 5.1.2	14 Ah when discharged at the C1 rate.	
Capacity at –30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	9 Ah when discharged at the C1 rate.	
Capacity at +50°C	DO-293, 2.2.5 IEC 60952-1, 5.1.4	25 Ah when discharged at the C1 rate.	
Power Rating +23°C	DO-293, 2.2.6.1 IEC 60952-1, 5.2.1.1	Ipp = 1000 A, Ipr = 650 A	
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2	Ipp = 750 A, Ipr = 600 A	
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3	Ipp = 550 A, Ipr = 450 A	
Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	13 Ah when discharged at 10 times the C1 rate to 10 volts.	
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	4 Ah when discharged at 10 times the C1 rate to 10 volts.	

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Charge Retention	DO-293, 2.4 IEC 60952-1, 5.4	+23 C - Rating value for design = 90 %	
		+50 C - Rating value for design = 70 %	
Storage	DO-293, 2.5 IEC 60952-1, 5.5	DO-293 - 1 year storage life test in process	
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	OK. Max battery temperature on charge = 52°C. Charge current fell during the charge period. Capacity at end of test > C1	
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Peak current = 1430 A Last recorded current = 631 A at 11.1 sec	
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	+23 C = 101%	
		-18 C (battery with heaters only) N/A	
		-40 C (battery with heaters only) N/A	
Insulation Resistance	DO-293, 2.9.1 IEC 60952-1, 5.9.1	All samples successfully met the test requirements.	
Dielectric Strength	DO-293, 2.9.2 IEC 60952-1, 5.9.2	All samples successfully met the test requirements.	
Duty Cycle Performance	DO-293, 2.10 IEC 60952-1, 5.10	100 cycles successfully completed.	
Water Consumption Test	DO-293, 2.11 IEC 60952-1, 5.11	N/A	
Overcharge Endurance	DO-293, no requirement IEC 60952-1, 5.12	Not tested	
Cyclic Endurance	DO-293, 2.12 IEC 60952-1, 5.13	100 cycles successfully completed.	
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	Test requirement successfully met.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	Test requirement successfully met.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A Battery contains no active electronics.	
Environmental Performance			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	Tested and qualified to DO-293.	
Acceleration	DO-293, no requirement IEC 60952-1, 6.2	Not tested	
Operational Shock	DO-293, 3.3.1 IEC 60952-1, 6.3, Class I	Tested and qualified to DO-293.	
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.4	Tested and qualified to DO-293.	

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Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.5	N/A	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	Tested and qualified to DO-293..	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no reqmt	Tested and qualified to DO-293.	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	Tested and qualified to DO-293.	
Fungus Resistance	DO-293, 3.7 IEC 60952-1, 6.8	Tested and qualified to DO-293.	
Humidity	DO-293, 3.8 IEC 60952-1, 6.9	Tested and qualified to DO-293.	
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	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 VI) Insecticides - none Sullage - none Disinfectants (heavy duty phenolics) - none Coolant dielectric fluid - none Fire extinguishants - none	
Salt Spray	DO-293, 3.10 IEC 60952-1, 6.11	Tested and qualified to DO-293.	

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance	Test Report / Reference
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	Tested and qualified to DO-293.	
Flammability	DO-293, no requirement IEC 60952-1, 6.13	Not tested. See Section 1	
Electrolyte Resistance	DO-293, 3.12 IEC 60952-1, 6.14	All samples met the specification requirements.	
Thermal Sensors	DO-293, 3.13 IEC 60952-1, 6.15	N/A	
Component Qualification tests	DO-293, 3.14 IEC 60952-1, 6.16	All components successfully met the test requirement.	
Battery Airtightness	DO-293, no requirement IEC 60952-1, 6.17	N/A	
Cell Baffle	DO-293, no requirement IEC 60952-1, 6.18	N/A. Applies only to nickel-cadmium batteries only.	
Strength of Receptacle	DO-293, 3.15 IEC 60952-1, 6.19	N/A	
Handle Strength	DO-293, 3.16 IEC 60952-1, 6.20	OK	

N/A = Not Applicable

Authentication:

Manufacturer. Concorde Battery Corporation

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
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Signed: ……
Name of signatory: John B. Timmons, PE
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