BioJet BC-175

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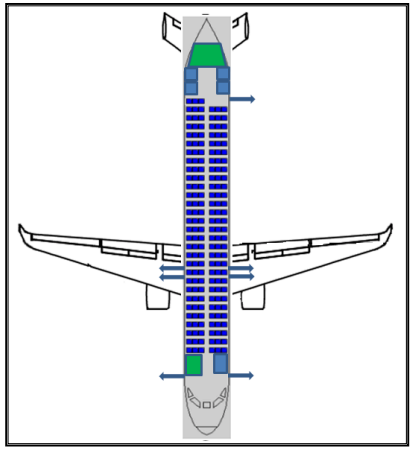
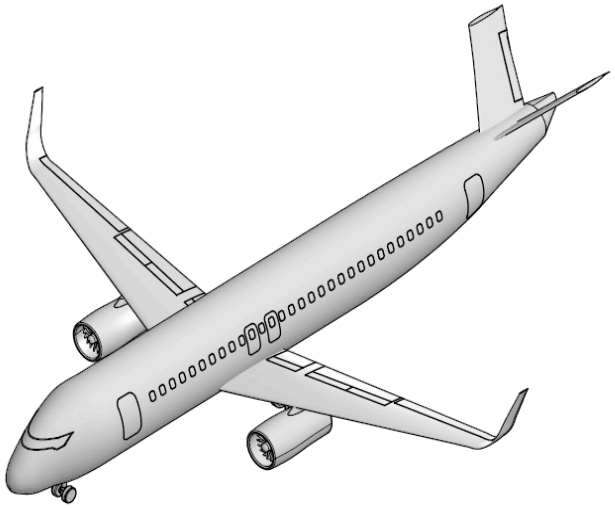
Executive Summary

Biojet is pleased to present its response to the request for proposal from the American Institute of Aerodynamics and Astronautics received on October 1, 2009. It calls for the development of a commercial airliner with a capacity of 175 passengers, entering service in 2020, primarily as a replacement for the Boeing 737/ Airbus A320. This vehicle is in high demand as existing aircraft in this category were not designed from the ground up to utilize alternate fuels. The RFP requires a reduction in emissions and improved cost effectiveness for the operator, and Biojet provides those solutions. This aircraft will have a range of 3500 nm with lower fuel consumption than current aircraft. Our aircraft exceeds the design requirements by increasing L/D_{max} by 30% as compared to current aircraft in its class. The aircraft's cruising speed is Mach 0.8 specified in the RFP. The aircraft has a balanced field length of 5930 ft and a landing speed of 124 knots. Additionally, the aircraft has an initial cruise altitude of 35,000 feet and a maximum cruising altitude of 41,000 feet. As an additional requirement, Biojet designed the aircraft to fit the class III gates that accommodate both the Boeing 737 and A320. The Biojet concept is a tube and wing design with a V-tail, which has been used in some aircraft but has not been used commercially. The concept is compared to the existing aircraft throughout the design and shows benefits in many areas. Biojet utilizes advanced technologies in the design ensuring that it fulfills the requirements of the RFP. These include the use of composite materials, advanced airfoil design, and advanced engine technologies. Biojet is proud to present the BC-175 as the next generation commercial airliner.

Cabin Layout	
Seats:	177
Emergency Exits:	7
Galleys:	2
Crew Stations:	1
Lavatories:	5
Attendant Stations:	2

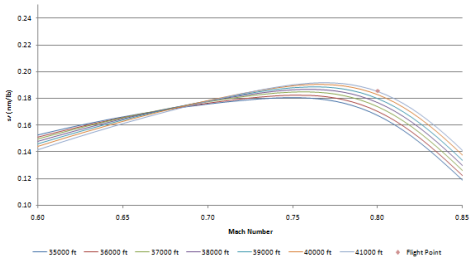


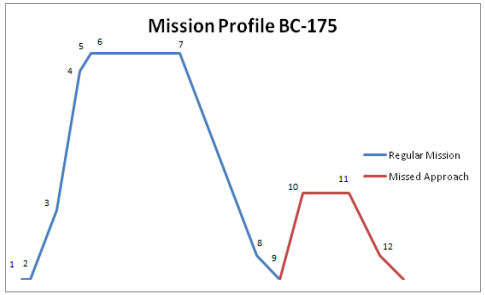


Aircraft	Boeing 737 – 800	Airbus A320	BC-175
Length (ft)	129.5	123	130
Wingspan (ft)	112 (117)	112	118
Cabin Width (ft)	11.6	12	13
Seating Capacity	189	164-180	175
MTOW (lbs)	174200	162000	125000
Balanced Field Length (ft)	8000-8300	6900	6200
Service Ceiling (ft)	41000	39000	41000
Cruise Speed (Mach)	0.78	0.8	0.8
Range Fully Loaded (nm)	3060	3200	3500
Engines	2 x CFM56-7	2 x CFM56-5	2 x PW1000g
Max Thrust (lbf)	2 x 27300	2 x 22000	2 x 28000
L/D Max	17	15	24
Cost (millions)	51.5-58.5	55-65	41.1

www.boeing.com www.airbus.com

Specific Range





Mission Profile						
Mission Segment	Mach	Altitude (ft)	L/D	Time (min)	Fuel (lbs)	Distance (nmi)
1. Taxi/Takeoff	0 - 0.23	SL	-	15.0	2041	0
2. First Climb Stage	0.23 - 0.37	0 - 10000	-	4.5	551	19
3. Second Climb Stage	0.37 - 0.48	10000 - 35000	-	12.1	1472	55
4. Third Climb Stage	0.48	35000 - 41000	-	3.8	409	17
5. Acceleration to Cruise	0.48 - 0.8	41000	-	1.0	93	6
6. Cruise	0.8	41000	21.64	440.2	18219	3354
7. Descent	0.8 - 0.25	41000 - 1500	-	31.6	2509	74
8. Landing	0.25 - 0	1500 - SL	-	5.0	680	0
Totals				513.3	25974	3526
Missed Approach						
9. Climb	0 - 0.37	0 - 15000	-	6.8	826	28
10. Cruise	0.37 - 0.4	15000	26.9	28.1	825	117
11. Descent	0.4 - 0.25	15000 - 1500	-	27.0	765	56
12. Landing	0.25 - 0	1500 - 0	-	5.0	680	0
Totals				66.9	3097	202
Overall Total				580.2	29071	3727