

ESTES A10T

CERTIFIED VALUES

Total Impulse: 1.88 newton-seconds
Delays: 0 seconds

Propellant Type: Black Powder
Propellant Mass: 3.57 grams

Casing Dimensions: 13 mm × 45 mm

Certification Date: 11-Feb-14

Certification Type: Model Rocket

STATIC TEST DATA

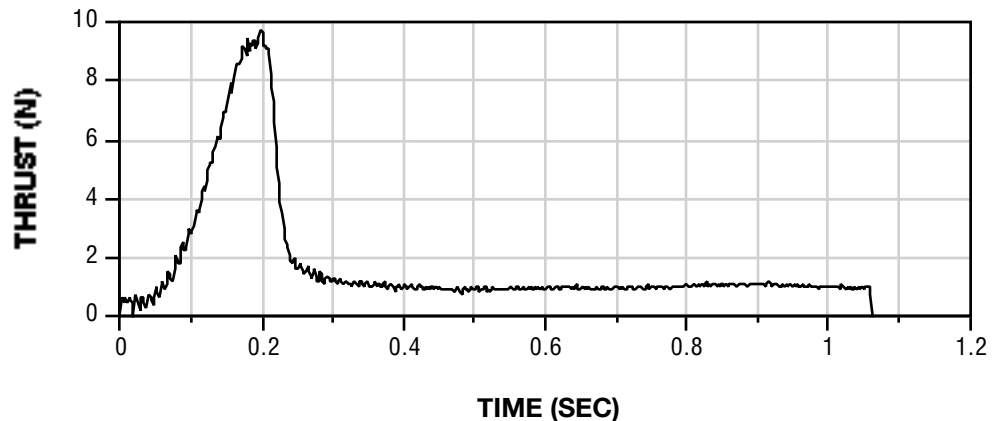
Date Tested: 11-Feb-13

Total Impulse: 1.88 newton-seconds (σ 0.06)
Peak Thrust: 9.74 newtons (σ 0.32)
Burn Time: 1.06 seconds (σ 0.05)
Average Thrust: 1.78 newtons

Mass After Firing: 3.33 grams

Delay Time	Average Measured Delay	Initial Mass	Mfg Recommended Max Liftoff Weight
0	0.00	6.97 g	

TYPICAL THRUST-TIME CURVE



REMARKS

FILE NAME	MOTOR	IT	F-MAX	F-AVG	T-BURN	M-INIT	M-BO
E021101	A10-0T	1.790	9.874	1.667	1.074	6.959	3.347
E021102	A10-0T	1.803	9.727	1.741	1.036	6.818	3.277
E021103	A10-0T	1.806	9.435	1.694	1.066	6.953	3.328
E021104	A10-0T	1.963	10.020	1.895	1.036	6.897	3.296
E021105	A10-0T	1.910	10.214	1.876	1.018	6.954	3.307
E021106	A10-0T	1.937	9.371	1.783	1.086	6.898	3.310
E021107	A10-0T	1.919	9.215	1.623	1.182	7.214	3.389
E021108	A10-0T	1.905	9.683	1.861	1.024	7.006	3.360
E021109	A10-0T	1.896	10.029	1.851	1.024	7.001	3.352
E021110	A10-0T	1.885	9.868	1.816	1.038	7.003	3.343
AVG		1.88	9.74	1.78	1.06	6.97	3.33
STD		0.06	0.32	0.10	0.05	0.10	0.03
% STD		3.22	3.30	5.35	4.65		

; Estes A10T RASP.ENG file made from NAR published data
 ; File produced March 3, 2011
 ; The total impulse, peak thrust, average thrust and burn time are
 ; the same as the averaged static test data on the NAR web site in
 ; the certification file. The curve drawn with these data points is as
 ; close to the certification curve as can be with such a limited
 ; number of points (32) allowed with wRASP up to v1.6.

```
A10T 13 45 0 .0038 .00525 E
0.016 0.492
0.040 0.752
0.062 0.962
0.078 2.051
0.096 2.858
0.122 4.611
0.138 6.054
0.162 8.100
0.180 9.502
0.198 9.740
0.212 8.204
0.224 4.530
0.238 2.054
0.268 1.414
0.292 1.385
0.324 1.067
0.364 1.099
0.396 0.957
0.446 0.995
0.490 0.901
0.574 0.909
0.676 0.909
0.782 1.031
0.886 1.048
0.980 1.029
1.006 0.995
1.038 1.049
1.050 0.741
1.060 0.000
```

