

# ESTES A8

## CERTIFIED VALUES

Total Impulse: 2.15 newton-seconds  
Delays: 0 seconds

Propellant Type: Black Powder  
Propellant Mass: 3.84 grams

Casing Dimensions: 18 mm × 70 mm

Certification Date: 11-Feb-14

Certification Type: Model Rocket

## STATIC TEST DATA

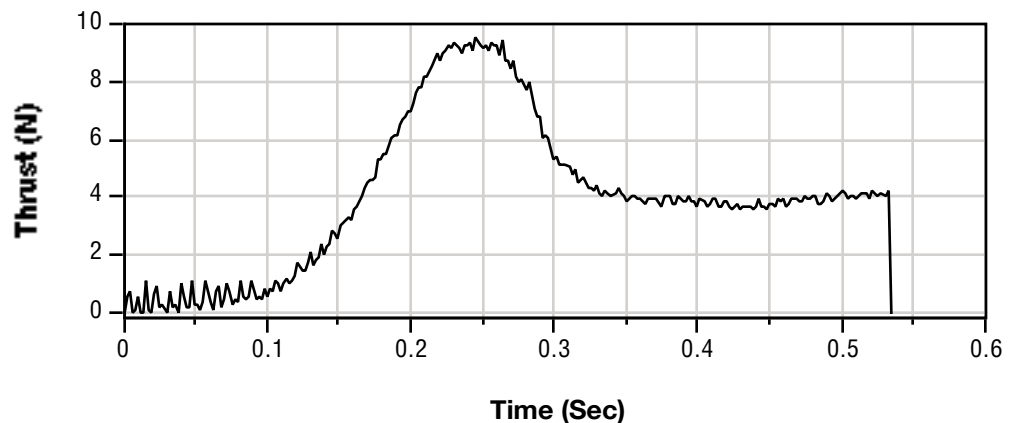
Date Tested: 11-Feb-13

Total Impulse: 2.15 newton-seconds ( $\sigma$  0.04)  
Peak Thrust: 9.56 newtons ( $\sigma$  0.54)  
Burn Time: .53 seconds ( $\sigma$  0.02)  
Average Thrust: 4.03 newtons

Mass After Firing: 10.19 grams

Delay Time	Average Measured Delay	Initial Mass	Mfg Recommended Max Liftoff Weight
0	0.00	13.89 g	

## TYPICAL THRUST-TIME CURVE



## REMARKS

FILE NAME	MOTOR	IT	F-MAX	F-AVG	T-BURN	M-INIT	M-BO
E021113	A8-0	2.195	10.202	4.287	0.512	13.770	10.070
E021114	A8-0	2.113	9.277	3.941	0.536	13.885	10.180
E021115	A8-0	2.193	9.614	4.282	0.512	13.894	10.218
E021116	A8-0	2.152	8.755	3.762	0.572	13.930	10.256
E021117	A8-0	2.133	9.615	3.979	0.536	13.892	10.208
E021118	A8-0	2.070	9.150	3.877	0.534	13.965	10.299
E021119	A8-0	2.097	9.095	3.731	0.562	14.013	10.277
E021120	A8-0	2.173	9.477	3.995	0.544	13.921	10.194
E021121	A8-0	2.182	9.775	4.213	0.518	13.875	10.153
E021122	A8-0	2.172	10.591	4.242	0.512	13.798	10.070
AVG		2.15	9.56	4.03	0.53	13.894	10.193
STD		0.04	0.54	0.21	0.02	0.07	0.08
% STD		2.01	5.68	5.26	3.97		

; Estes A8 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.

```
A8 18 70 0 .00384 .01389 E
0.016 1.080
0.036 0.293
0.050 0.259
0.060 0.357
0.070 0.419
0.080 0.355
0.102 0.781
0.124 1.443
0.152 2.966
0.170 4.426
0.202 7.160
0.224 9.051
0.246 9.555
0.256 9.317
0.276 7.958
0.294 6.108
0.326 4.235
0.350 3.813
0.376 3.997
0.410 3.926
0.452 3.724
0.474 4.046
0.502 4.092
0.532 4.146
0.534 0.000
```

