

ESTES C11

CERTIFIED VALUES

Total Impulse: 9.00 newton-seconds
Delays: 0, 3, 5, 7 seconds

Propellant Type: Black Powder
Propellant Mass: 12.0 grams

Casing Dimensions: 24 mm × 70 mm

Certification Date: 2001-June-18
Contest Use Date: 2001-August-17

Certification Type: Model Rocket

STATIC TEST DATA

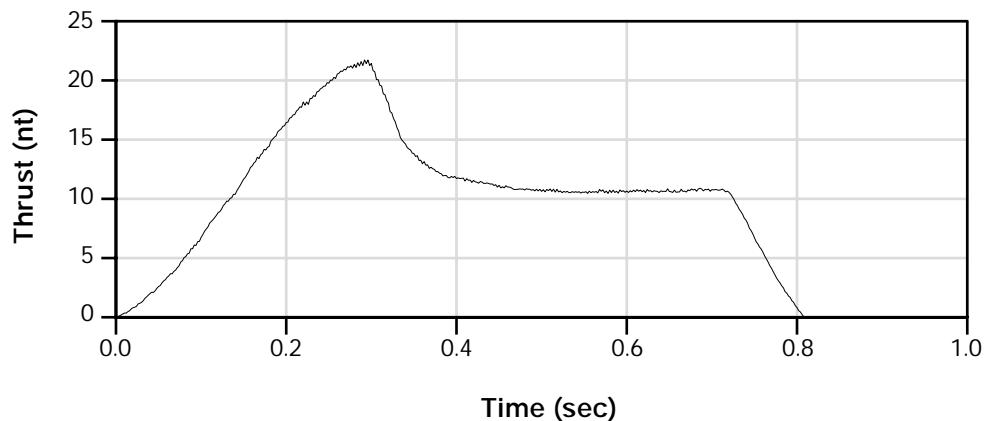
Date Tested: 2001-June-17

Total Impulse: 8.80 newton-seconds (σ 0.17)
Peak Thrust: 21.73 newtons (σ 0.62)
Burn Time: 0.81 seconds (σ 0.03)
Average Thrust: 10.86 newtons

Mass After Firing: 18.9 grams

Delay Time	Average Measured Delay	Initial Mass	Mfg Recommended Max Liftoff Weight
0	0.00	30.4 g	
3	3.65	34.5 g	
5	5.24	35.5 g	
7	6.38	35.7 g	

TYPICAL THRUST-TIME CURVE



REMARKS

; ESTES C11 RASP.ENG file made from NAR published data
; File produced JANUARY 1, 2002
; 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.

```
C11 24 70 0-3-5-7 .012 .0353 E  
0.034 1.692  
0.066 3.782  
0.107 7.566  
0.145 10.946  
0.183 14.832  
0.214 17.618  
0.226 18.213  
0.256 20.107  
0.281 21.208  
0.298 21.730  
0.306 20.206  
0.323 17.321  
0.337 14.931  
0.358 13.236  
0.385 11.947  
0.413 11.650  
0.468 10.946  
0.539 10.450  
0.619 10.648  
0.683 10.648  
0.715 10.648  
0.726 10.053  
0.740 8.163  
0.758 5.773  
0.778 3.185  
0.795 1.394  
0.810 0.000
```

