

WAsc 1850

Propellant Test
Forms

POLYBUTADIENE PROPELLANTS

CONSTANT STRAIN TEST

Composition No.

Batch No.

Date of Manufacture

Cure History

days/weeks at

°C

Special Notes

Date on Test	Test Temp °C	Applied Extension %	Hours Counter Reading		Time on Test	Result	Gauge Length, After Test, cm.	
			Initial	Final			1 hr.	1 week

Extension, %	10	15	20	25	30	35	40	45	50	55	60
Gauge Length, cm	3.3	3.45	3.6	3.75	3.9	4.05	4.2	4.35	4.5	4.65	4.8

Material

Date

Room temperature =

Log viscosity (η) = $\bar{4}$.

Powder Bed Dimensions (D)

Tube + bed = _____ $\log (D-d)^* =$
 Tube only = _____ $-\log D =$
 D = _____ $\log \epsilon =$
 $\epsilon = \frac{(D-d)^*}{D}$ $\epsilon =$
 $(1-\epsilon) =$

Pressure head across bed (H) = _____ cm/water

Air flow through bed

(a) Stop watch method (P757 lab)

Volume passed (V) = _____ cc Time = _____ seconds

Deduct correction for empty tube = _____ seconds
 (if unmilled)

T = _____ seconds

(b) Flowmeter method (P721 lab). Capillary no.

1. Manometer height cm/H₂O = _____ seconds

2. Manometer height cm/H₂O = _____ seconds (if unmilled)

Volume (V) = 1000 cc T = _____ seconds

$$S_o = \frac{14 \sqrt{\frac{\epsilon^3 \times T \times A \times H}{(1-\epsilon)^2 \times \eta \times V \times D}}}{1}$$

Numerator

Denominator

No.	log.	No.	log.
ϵ	$\bar{1}$	$1-\epsilon$	$\bar{1}$
	X3		X2
ϵ^3	_____	$(1-\epsilon)^2$	_____
T	_____	η	$\bar{4}$
A	0 1 0 3 5	V	_____
H	_____	D	0
num.	_____	denom =	_____
denom.	_____		
$\div 2$			
+ log 14	1 1 4 6 1		
log S _o	_____	SPECIFIC SURFACE =	_____

* If 2.48 gm ammonium perchlorate used, d = 1. (for 0.5 inch diam. tube)