

name _____

section _____

desk# _____

date _____

lab partner's name _____

(ONLINE DATA)

Statistical Analysis of Zinc Coated Washers Data Sheet

Recorded Data: (All data should be recorded in pen.)

Washer Dimension Measurements (Record all measurements to the nearest 0.01 cm.)

	Washer 1	Washer 2	Washer 3	Washer 4	Washer 5
(1) Outer Diameter, cm	2.58	2.56	2.62	2.57	2.56
(2) Inner Diameter, cm	1.09	1.12	1.08	1.10	1.07
(3) Height, cm	0.18	0.23	0.22	0.19	0.18

Calculations: (Record all measurements to the nearest 0.01 cm.)

Convert Diameters to radii. ($r = d/2$)

(4) Outer radius, cm	_____	_____	_____	_____	_____
(5) Inner radius, cm	_____	_____	_____	_____	_____

Determine the Surface Area (Area of the Zinc Coating) for each washer.

$$SA = 2\pi(r_o^2 - r_i^2) + 2\pi r_o h + 2\pi r_i h$$

(6) Surface Area, cm ²	_____	_____	_____	_____	_____
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Statistical Analysis of the Surface Area

(Keep ALL digits until the final step - Step 7.)

ΣSA_i , cm ²	\overline{SA} , cm ²	$(SA_i - \overline{SA})$, cm ²	$(SA_i - \overline{SA})^2$, cm ⁴	$\Sigma(SA_i - \overline{SA})^2$, cm ⁴
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

$$\Sigma(SA_i - \overline{SA})^2 / (n - 1), \text{ cm}^4$$

(7) Standard Deviation, s , cm² _____

(8) CI for single value, CI_s (98%), cm² ± _____

(9) CI for mean value, CI_m (98%), cm² ± _____

name _____ section _____ desk# _____ date _____
 lab partner's name _____ (ONLINE DATA)

Recorded Data: (All data should be recorded in pen.)

Mass Determinations (Record Mass to the nearest 0.001g)

	Washer 1	Washer 2	Washer 3	Washer 4	Washer 5
(10) Initial Mass, g	6.398	6.524	5.918	6.235	6.442
(11) Final Mass, g	6.367	6.496	5.884	6.208	6.418
(12) Mass Difference, g	_____	_____	_____	_____	_____

Determine the Volume of the Zinc Coating for each washer.

($d = m/v$ so $v = m/d$ where $d_{\text{zinc}} = 7.14 \text{ g/cm}^3$)

(13) Volume, cm^3 _____

Statistical Analysis of Volume

(Keep ALL digits until the final step - Step 14.)

$\Sigma V_i, \text{cm}^3$	\bar{V}, cm^3	$(V_i - \bar{V}), \text{cm}^3$	$(V_i - \bar{V})^2, \text{cm}^6$	$\Sigma(V_i - \bar{V})^2, \text{cm}^6$
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

$\Sigma(V_i - \bar{V})^2 / (n - 1), \text{cm}^6$ _____

(14) Standard Deviation, s, cm^3 _____

(15) CI for single value, CI_s (98%), cm^3 \pm _____

(16) CI for mean value, CI_m (98%), cm^3 \pm _____

name _____ section _____ desk# _____ date _____

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Recorded Data: (All data should be recorded in pen.)

Determine the Thickness of the Zinc Coating in cm for each washer.

(Thickness = Volume/Surface Area) (For Volume and Surface Area – Copy Values Recorded Previously.)

- (17) Volume, cm³ (13) _____
- (18) Surface Area, cm²(6) _____
- (19) Thickness, cm _____

Determine the Thickness of the Zinc Coating in atoms for each washer.
(Use equation given below.)

$$\text{Zinc(cm)} \times \frac{1 \text{ meter}}{100 \text{ cm}} \times \frac{1 \times 10^{12} \text{ pm}}{1 \text{ m}} \times \frac{1 \text{ atom Zn}}{268 \text{ pm}}$$

- (20) Thickness, atoms _____

Statistical Analysis of the Thickness
(Keep ALL digits until the final step – Step 21.)

ΣT_i , atom	\bar{T} , atom	$(T_i - \bar{T})$, atom	$(T_i - \bar{T})^2$, atom ²	$\Sigma(T_i - \bar{T})^2$, atom ²
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

$\Sigma(T_i - \bar{T})^2 / (n - 1)$, atom² _____

- (21) Standard Deviation, s, atom _____
- (22) CI for single value,
CI_s (98%), atom ± _____
- (23) CI for mean value,
CI_m (98%), atom ± _____