Homework for Experiment: Ceramics

The following are 2 sets of Modulus of Rupture test data on glasses. The only differences of the 2 sets are specimen width. The specimen width of the first set is 1.5 in, the second sets is 0.5 in. Each set has five tests.

Specimen no.	Width(in)	Fmax(lb)	F1(lb)	$\delta 1$(in)	F2(lb)	$\delta 2$(in)
1	1.5	318	212	0.046	106	0.040
2	1.5	276	184	0.027	92	0.021
3	1.5	331	220.67	0.029	110.33	0.023
4	1.5	291	194	0.028	97	0.022
5	1.5	277	184.67	0.033	92.33	0.027
1	0.5	139	92.67	0.022	46.33	0.019
2	0.5	83	55.33	0.026	27.67	0.023
3	0.5	96	64	0.024	32	0.021
4	0.5	111	74	0.019	37	0.013
5	0.5	139	92.67	0.032	46.33	0.029

L = Length Between Outer Supports = 2 in
h = specimen height or thickness = 1/8 in

Stress Values may be higher than expected due to load cell inaccuracy at low load values.

Problems:
(1) Calculate the σ_{fs}, E_{fs} for each test, where σ_{fs} is the Flexural Strength and E_{fs} is the Flexural Modulus.

(2) Apply the t-Test to he combined Flexural Strength results of the two sets and investigate whether or not there is a size (width) effect at a 0.05 Level of Significance.