

GRAIN PRESSURE TESTS, No. 7B.

Wheat.—Square Wooden Bin.—Side Pressure Tests.

Size of Bin 12" x 12" x 6' 6" high.

Smooth Boards.

Diaphragm on bottom, size 12" x 12"=144 sq. inches.

Wheat 50 lbs. per cu. ft., equal to 62.2 lbs. per bushel.

First section of grain column in Bin 12" high covering face of diaphragm weight 50 lbs.; combined area of four sides=576 sq. in. all following sections=4.80 inches high, weighing 20 lbs. area of four sides=230.4 square inches.

Grain weighed into bin.	Height of grain column	Equivalent fluid pressure.	Pressure of grain on diaphragm.		Side pressure per section.	Grain running out, pressure of grain on diaphragm.	
lbs.	ins.	ins. water.	ins. water.	lbs per sq. inch.	lbs.	ins. water.	lbs. per sq. inch.
50	12.00	9.62	2 $\frac{1}{2}$	0.10373	59.748	2	0.07442
70	16.80	13.47	4 $\frac{1}{4}$	0.15334	35.329	4 $\frac{1}{4}$	0.15334
90	21.60	17.31	4 $\frac{3}{4}$	0.17138	39.496	5 $\frac{1}{8}$	0.20295
110	26.40	21.15	5 $\frac{1}{8}$	0.18491	42.603	5 $\frac{3}{4}$	0.20746
130	31.20	24.99	5 $\frac{7}{8}$	0.19619	45.201	5 $\frac{7}{8}$	0.20746
150	36.00	28.86	5 $\frac{5}{8}$	0.19844	45.720	5 $\frac{5}{8}$	0.21197
170	40.80	32.71	5 $\frac{9}{16}$	0.20070	46.240	6	0.21648
190	45.60	36.56	5 $\frac{3}{4}$	0.20295	46.760	5 $\frac{3}{4}$	0.21197
210	50.40	40.41	5 $\frac{11}{8}$	0.20521	47.279	6 $\frac{1}{8}$	0.22099
230	55.20	44.26	5 $\frac{3}{4}$	0.20746	47.799	6 $\frac{1}{8}$	0.22099
250	60.00	48.10	5 $\frac{3}{4}$	0.20746	47.799	6 $\frac{1}{8}$	0.22550
270	64.80	51.95	5 $\frac{3}{4}$	0.21197	48.838	6 $\frac{5}{8}$	0.22775
290	69.60	55.80	5 $\frac{3}{4}$	0.21197	48.838	6 $\frac{5}{8}$	0.22775
310	74.40	59.65	5 $\frac{3}{4}$	0.21197	48.838	6 $\frac{5}{8}$	0.22775
325	78.00	62.53	5 $\frac{3}{4}$	0.21197	36.620	7 $\frac{1}{8}$	0.21197

Total side pressure. 687.108

RELATIVE VERTICAL AND LATERAL PRESSURE.

(See Test No. 7A.) Pressure on bottom of bin 9 $\frac{1}{4}$ " water = 0.35178 lbs. per sq. in. $\times$ area of diaphragm 144 sq. inches = 50.656 lbs.

Maximum pressure on sides when grain at rest - 5 $\frac{3}{8}$ " water = .21197 lbs. per sq. inch.

Vertical pressure = 0.35178

= 60 % of vertical pressure, or vertical

Lateral pressure = 0.21197 pressure = 1.67 % of lateral pressure.

Co-efficient of friction Weight carried by sides = 274.344 lbs.

between

$$\frac{\text{Wheat and sides of bin}}{\text{Total side pressure}} = \frac{274.344}{687.108} = 0.397$$

GRAIN IN MOTION:—

Grain running out of bin at rate of 120 lbs. per minute through opening in centre of hopper bottom, maximum pressure 6 $\frac{1}{8}$ " water, equals 0.22775 lbs. per square inch = 9.3 % increase of pressure due to grain in motion