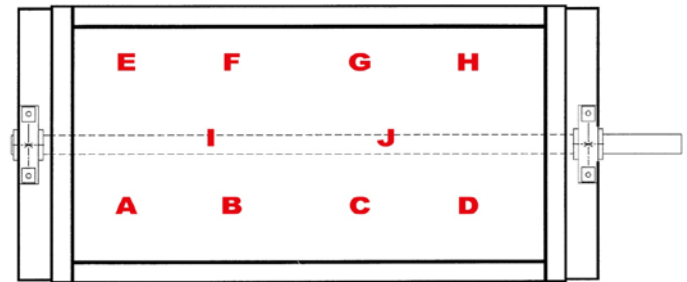




H&S BATCH MIXER TEST PROCEDURE

- 1) Ground corn (approximately 400 – 700 micron mean particle diameter) is added to the mixer at the mixer's rated capacity. The mixer is started and operated until the product is evenly dispersed across the width and length of the mixer. The mixer is then stopped.
- 2) Screened, granulated table salt equal to 1% by weight of the ground corn, is added at one end of the mixer.
- 3) The mixer is then started and allowed to run for a designated time interval. The mixer is then stopped and locked out.
- 4) A minimum of 10 probe samples (approximately 50 – 100 grams each) are then taken in accordance with the SAMPLE TEST LOCATIONS sketch shown. Each probe sample is transferred into labeled Whirl-pak[®] sample bag and sealed.
- 5) The mixer may then be restarted to run for additional designed time intervals with step #4 repeated for each additional interval.
- 6) Each sample is then individually ground, in its entirety, in a small coffee grinder. After grinding, the sample is transferred into a beaker and mixed with a spatula to reincorporate any dust or fine powder that separated during the grinding and transfer process.
- 7) A 5 gram sub-sample is weighed into a labeled 200 ml beaker. Each 5 gram sub-sample is diluted with 100 ml of deionized water buffered with Omnion[®] sodium reagent. Each mixture is stirred thoroughly to allow the salt to completely dissolve into solution.
- 8) Each solution is measured in ppm of sodium with a calibrated Omnion[®] Sodium Ion Analyzer.
- 9) The mean, the standard deviation, and coefficient of variation are calculated from each set of samples taken for a given mixing time interval.



SAMPLE TEST LOCATIONS

Mean Formula: $\bar{x} = \frac{\sum_{i=1}^n x_i}{N}$

Standard Deviation Formula: $\sigma = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{N}}$

Coefficient of Variation Formula: $C.V = \frac{\sigma}{\bar{x}}$

- Where:
- \bar{x} = mean
 - x_i = value of each sample
 - N = number of samples
 - σ = standard deviation
 - $C.V$ = coefficient of variation

MIXER PROFILE EXAMPLE

TEST PARAMETERS: 189 Cu Ft. Horizontal Twin Shaft Ribbon mixer
 6,000 lb. batch ground corn - No liquids
 Sampled at 30, 60, 90 & 120 second mix times

THEORETICAL (0.05 g NaCl) (5 g sample) (.3935 g Na) (1 ml water) (1,000,000 mg) 98.125 mg Na

MEASUREMENT: (1 g sample) (100 ml water) (1 g NaCl) (1 g water) (1 Kg) Kg water

Sample	30 sec	60 sec	90 sec	120 sec
A	78	105	102	99
B	68	97	98	103
C	53	102	100	100
D	61	104	106	100
E	64	103	104	103
F	146	96	102	99
G	84	103	105	103
H	94	100	102	105
I	112	97	100	109
J	72	102	104	100
Mean	83.20	100.90	102.30	102.10
Std. Dev.	27.98	3.21	2.50	3.18
% C. V.	33.63	3.18	2.44	3.11