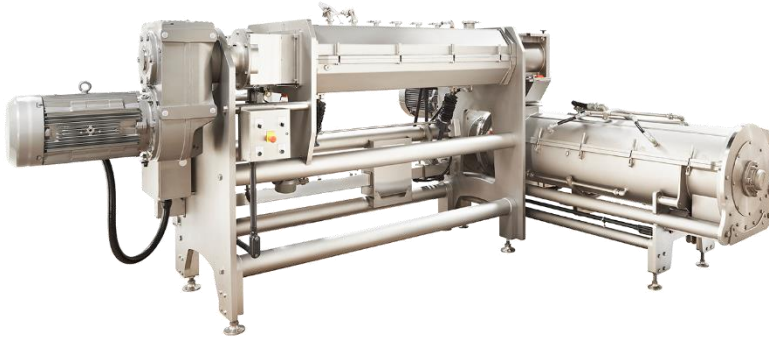# MIXING SYSTEMS ENERGY CONSUMPTION COMPARISON

Manufacturers can claim significant energy savings alongside consistent production characteristics and labor savings as reasons to choose continuous mixing systems over batch mixers.

HDX Continuous Mixer

BATCH MIXING

Ingredients are loaded into the main bowl or mixing chamber at the same time at the beginning of the mixing process. A paddle or arm is rotated through the ingredients within the bowl for a specific length of time and at a specific speed. At the end of the mixing cycle the batch of dough is collected out of the bowl and loaded into the production line.

CONTINUOUS MIXING

Ingredients are continuously metered and fed into the mixer via chutes and hoses connected to the mixing chamber. A shaft with various mixing elements attached to it runs along the length of the chamber and combines the ingredients consistently until they are discharged as dough loaves at the end of the chamber. The loaves are fed directly into the production line.

In a side by side comparison – mixing the same dough type in the same plant for the same time period – a continuous mixing system demonstrated far less energy consumption during production conditions.

COMPARISON CONCLUSION

Each mixer's energy consumption was sampled at ten second intervals over the course of an hour for a total of 361 data points.

- **The continuous mixer recorded approximately 29% less energy used during production, but had the same product yield.**

- **The median energy reading was over 42% less for the continuous mixer.**

EXACT MIXING

June, 2016

ANALYSIS

MIXER TYPE	BATCH	CONTINUOUS
Production	Hamburger Bun Dough @ 8,000 lbs. / hr.	
Production Time	60 minutes	
Number of Samples	361 (every ten seconds)	
Highest Recorded Energy (95% percentile)	146,059 watts (139,600 watts)	64,240 watts (60,600 watts)
Average Energy Reading (μ)	75,685 watts	57,481 watts
Median Energy Reading	100,000 watts	57,400 watts
Approximate Energy Used	29,560,000 watts	20,867,400 watts
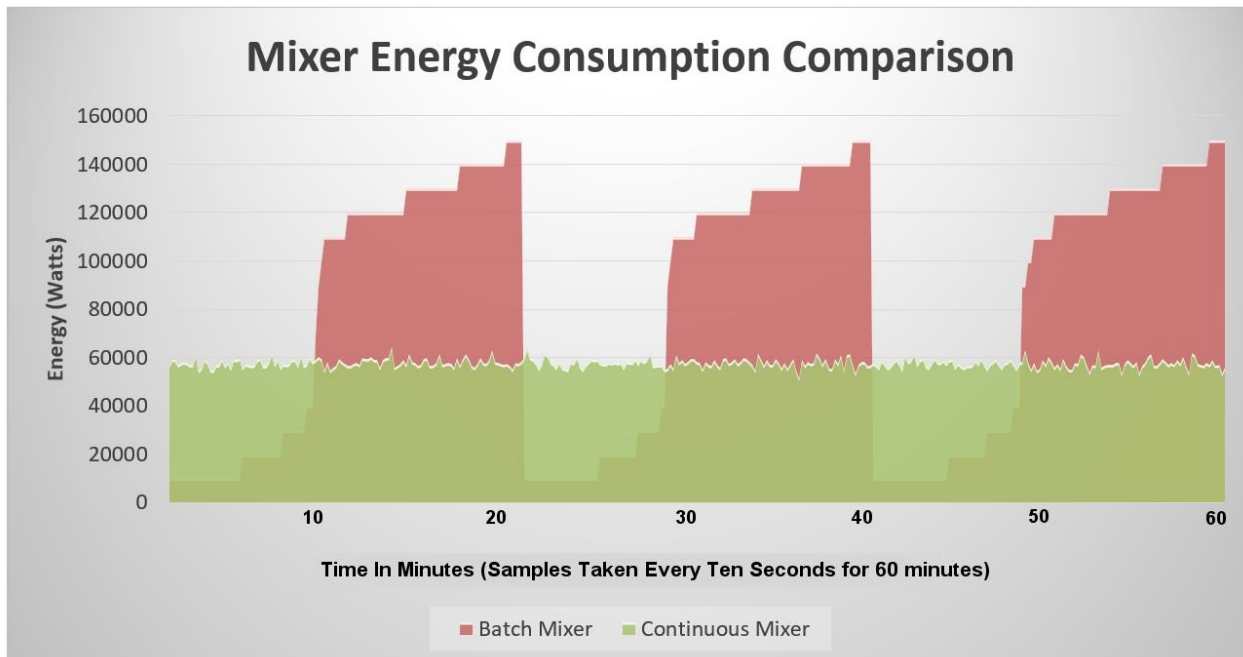
Please Note: The chart shows the exact readings (shown in the following tables) measured at the mixers, but is arranged to represent typical production energy use over time.

RAW DATA

Each mixer's energy consumption was sampled at ten second intervals over the course of an hour for a total of 361 data points.

BATCH MIXER	
Watts	Frequency
10000	77
20000	40
30000	25
40000	8
50000	0
60000	0
70000	1
80000	0
90000	4
100000	4
110000	23
120000	58
130000	53
140000	49
150000	19

CONTINUOUS MIXER	
Watts	Frequency
51400	1
52400	1
52900	1
53400	5
53900	1
54400	8
54900	10
55400	12
55900	21
56400	38
56900	40
57400	39
57900	36
58400	38
58900	26
59400	35
59900	16
60400	8
60900	8
61400	5
61900	7
62900	3
63900	1
64400	1