

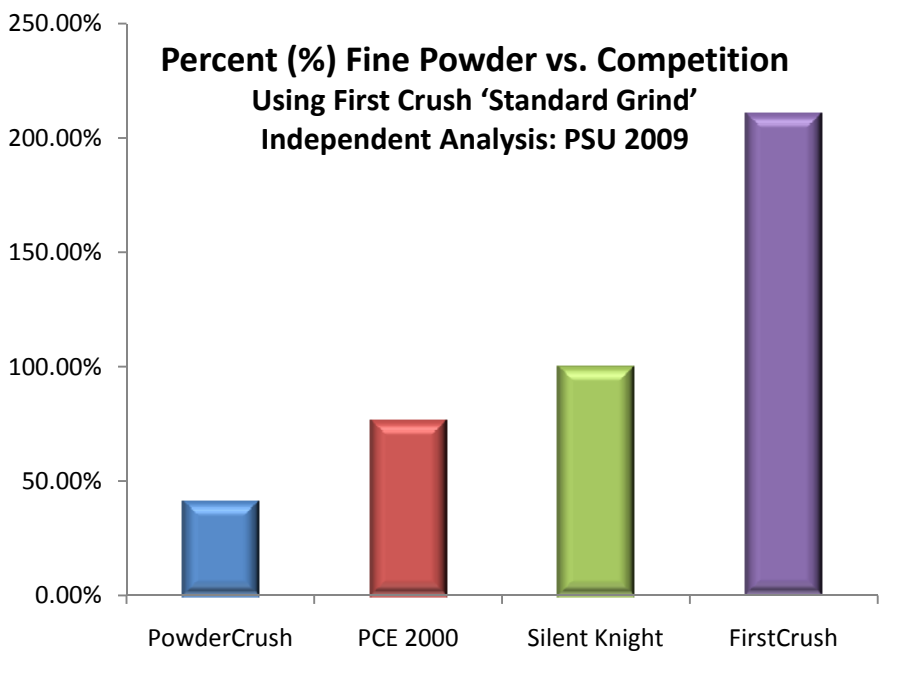


# FIRST CRUSH™

AUTOMATICALLY TURNS PILLS INTO POWDER™

Penn State University's College of Engineering, established in 1896, has a long tradition as one of the country's leading educators of engineers, and holds one of the nation's largest programs with over 380 full time faculty members. In the Fall of 2009, the school tested the leading pill crushing systems available on the marketplace as the first step of defining a new standard of care for the healthcare industry.

**Percent (%) Fine Powder vs. Competition**  
Using First Crush 'Standard Grind'  
Independent Analysis: PSU 2009



## Create Powder, Not Problem

Whether clogging of patient feeding tubes or patient's spitting out their medication, fineness of powder impacts clinical efficacy.

Across various combinations of the hardest pills to crush (Calciums, Multi-Vitamins, Senakot laxatives), First Crush™ consistently produced more fine powder than the competition for a set period of time and effort.

## Improved Staff Utilization

Existing crushers require users to be captive to the crushing process. First Crush replaces this effort and frees the nurse to focus on patient care. Only after significantly more time and effort, do other crushers approach what First Crush™ provides with a simple push of a button.

**Independent Analysis: even 2x the time and effort can't match one cycle of First Crush™:**

Silent Knight:  
35% less  
performance

PCE-2000:  
88% less  
performance

Powder Crush:  
Performance equal  
to First Crush™ could not be  
achieved

# First Crush™ Creates Powder *not* Problems

## Automation doesn't cause higher noise levels

<u>Model</u>	<u>Test 1</u>	<u>Test 2</u>	<u>Test 3</u>
First Crush (2 in away)	77	78	78
PowderCrush (2 in away)	82	81	81
SilentKnight (2 in away)	77	75	76

### Noise Measurements:

The tests were carried out with the decibel meter at 2.0055in away from the units. The noise levels in all cases were less than the OSHA 85 dB 16 hour maximum per day exposure limit.

<u>Model</u>	<u>Internal surface area of pill bag/cup</u>
Big MouthBag (PCE-2000)	25 in <sup>2</sup>
PowderCrush Bag	19 in <sup>2</sup>
Silent Knight Bag	18 in <sup>2</sup>
FirstCrush cups (top and bottom)	8 in <sup>2</sup>

Get more medication to the patient, less in the bag

### Surface Area:

Powder will stick to any surface area which comes in contact with the medication. Smaller surface area leads to less medication residue lost in the act of crushing.

First Crush has the smallest footprint of existing crushers

<u>Model</u>	<u>Length (in)</u>	<u>Width (in)</u>	<u>Surface area for bottom of device</u>
PCE 2000	13.935	4.754	38.5533 in <sup>2</sup>
Powdercrush	11.54	3.2765	37.8108 in <sup>2</sup>
SilentKnight	10.4517	2.991	31.2610 in <sup>2</sup>
FirstCrush	2.8	3.28	28.8524 in <sup>2</sup>

### Abstract from Penn State report:

The study is set up to mimic the conditions in an institutional setting where the pill crushers are commonly used. The specific objectives of these testing were:

- 1) To measure crushed pill fineness focusing on the percentage of crushed pill weight passing through a 7 mesh screen. This was determined for four pill combinations using three replicates. [Sieve Tests]
- 2) To conduct extended crushing trials to determine if the crushing fineness for the First Crush can be achieved by the other three commercial units after extended, nonstandard crushing cycles. [Further Sieve Tests on Commercial Units]
- 3) To conduct a noise comparison between the four crushing units. [Noise Measurements]
- 4) To measure the surface area of the crushing bags that comes in contact with the pill combination and the footprints of the crushers. [Area Measurements]

### Pill combinations tested were:

- (1) 3 Nature's Made Calcium 500 mg tablets, UPC code # 0 31604 01886 3.
- (2) 2 Nature's Made Calcium 500 mg tablets UPC code # 0 31604 01886 3, and 1 Multilex tablet
- (3) Three Extra Strength Tylenol PMS, 500 mg, NDC # 50580-482 13
- (4) Two Senna Plus tablets, NDC # 0904-5512-80.