# Penn State Particle Separator

## 3-Sieve Model with 1.18-mm Sieve

First available in 2002

## Recommended distribution of particle size (percent remaining on each screen) for corn silage, haylage, and TMR samples

<table>
<thead>
<tr>
<th>Screen</th>
<th>Pore Size (inches)</th>
<th>Particle Size (inches)</th>
<th>Corn Silage</th>
<th>Haylage</th>
<th>TMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Sieve (19 mm)</td>
<td>0.75</td>
<td>&gt; 0.75</td>
<td>3 to 8%</td>
<td>10 to 20%</td>
<td>2 to 8%</td>
</tr>
<tr>
<td>Middle Sieve (8 mm)</td>
<td>0.31</td>
<td>0.31 to 0.75</td>
<td>45 to 65%</td>
<td>45 to 75%</td>
<td>30 to 50%</td>
</tr>
<tr>
<td>Lower Sieve (1.18 mm)</td>
<td>0.05</td>
<td>0.07 to 0.31</td>
<td>30 to 40%</td>
<td>20 to 30%</td>
<td>30 to 50%</td>
</tr>
<tr>
<td>Bottom Pan</td>
<td>&lt; 0.07</td>
<td>&lt; 5%</td>
<td>&lt; 5%</td>
<td>&lt; 5%</td>
<td>&lt; 20%</td>
</tr>
</tbody>
</table>

Note: Since the pores in the lower sieve are square, the diagonal provides the largest opening. Therefore, the largest particles that can theoretically pass through this screen are 0.07 inches (1.67 mm) in length.
# Data Sheet For Forage and TMR Particle Size Analysis

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Weight of material retained on each sieve</th>
<th>Sum of Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper (a)</td>
<td>Middle (b)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Calculations for percentage retained on each sieve

- **Upper** $\left[= \frac{a}{e} \times 100\right]$  
- **Middle** $\left[= \frac{b}{e} \times 100\right]$  
- **Lower** $\left[= \frac{c}{e} \times 100\right]$  
- **Bottom Pan** $\left[= \frac{d}{e} \times 100\right]$

## Calculations for percentage under each sieve

- **Upper Sieve** $\left[f = 100 - \left(\frac{a}{e} \times 100\right)\right]$  
- **Middle Sieve** $\left[g = f - \left(\frac{b}{e} \times 100\right)\right]$  
- **Lower Sieve** $\left[h = g - \left(\frac{c}{e} \times 100\right)\right]$
TMR Particle Size Analysis

Cumulative Percentage Undersized

Particle size (inches)
Corn Silage Particle Size

Particle size (inches)

Cumulative Percentage Undersized

Penn State Particle Separator - 3-Sieve Model with 1.18-mm Sieve
Haylage Particle Size Analysis

Particle size (inches)

Cumulative Percentage Undersized

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