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The importance of optimized centrifugal operation on product quality and on factory operation costs

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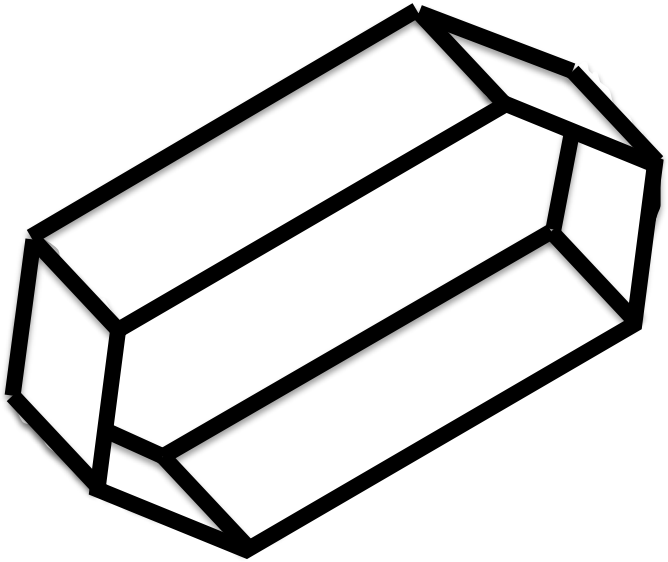
Part 2

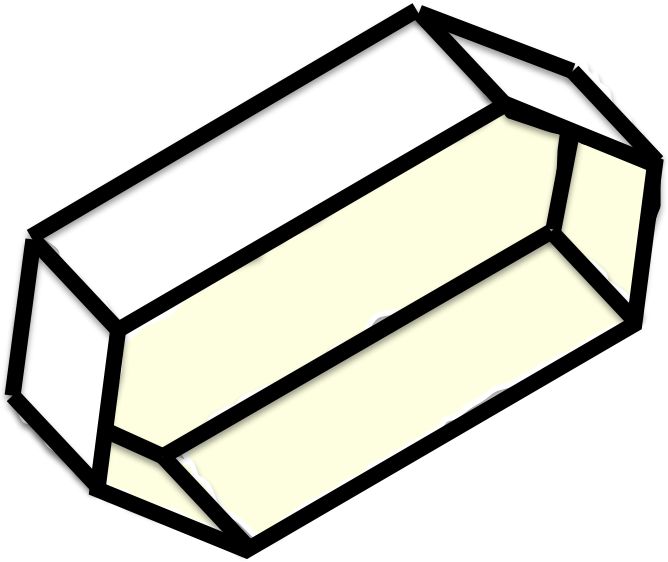
Avoiding operational errors by using inline colour measurement inside sugar cenrifugals

The task of the centrifugal is to seperate the sugar crystal from the mother liquor in a way that crystal destruction and sugar losses are minimized.

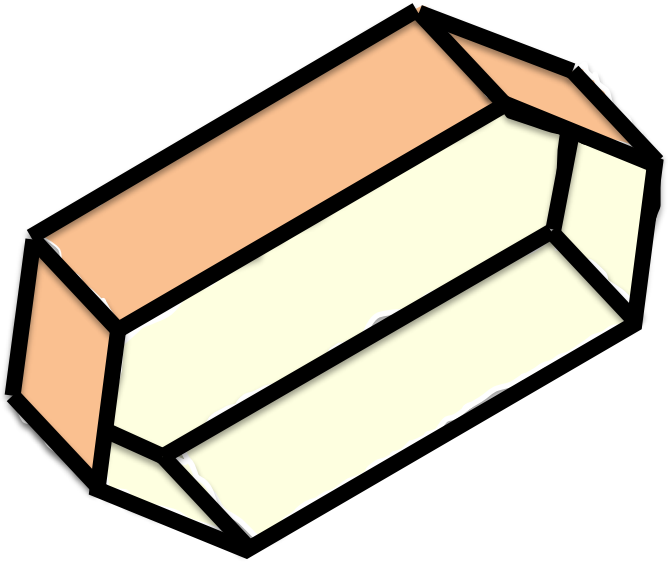
Pure sucrose crystal without colour inclosures



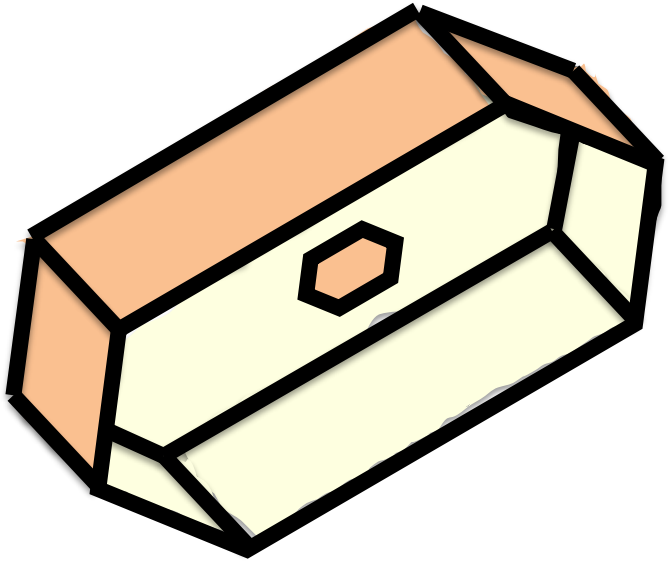
Sucrose crystal with colour inclosures



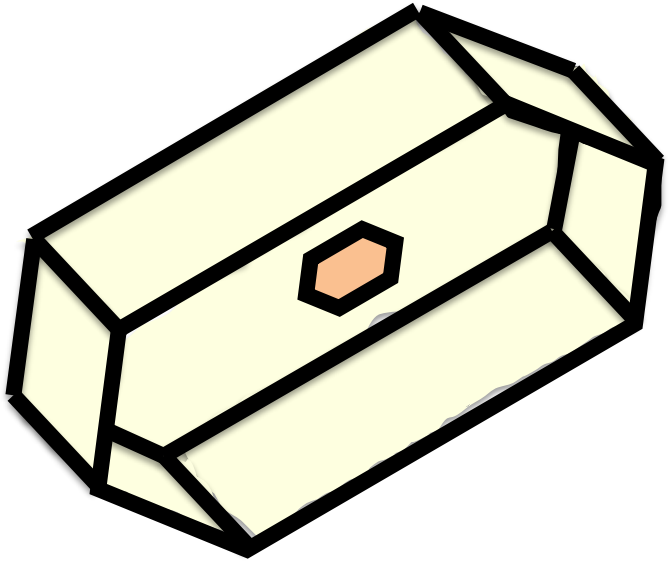
Sucrose crystal with colour inclosures and syrup film



Sucrose crystal with colour inclosures, syrup film and raw sugar seed crystal



Sucrose crystal after centrifugation



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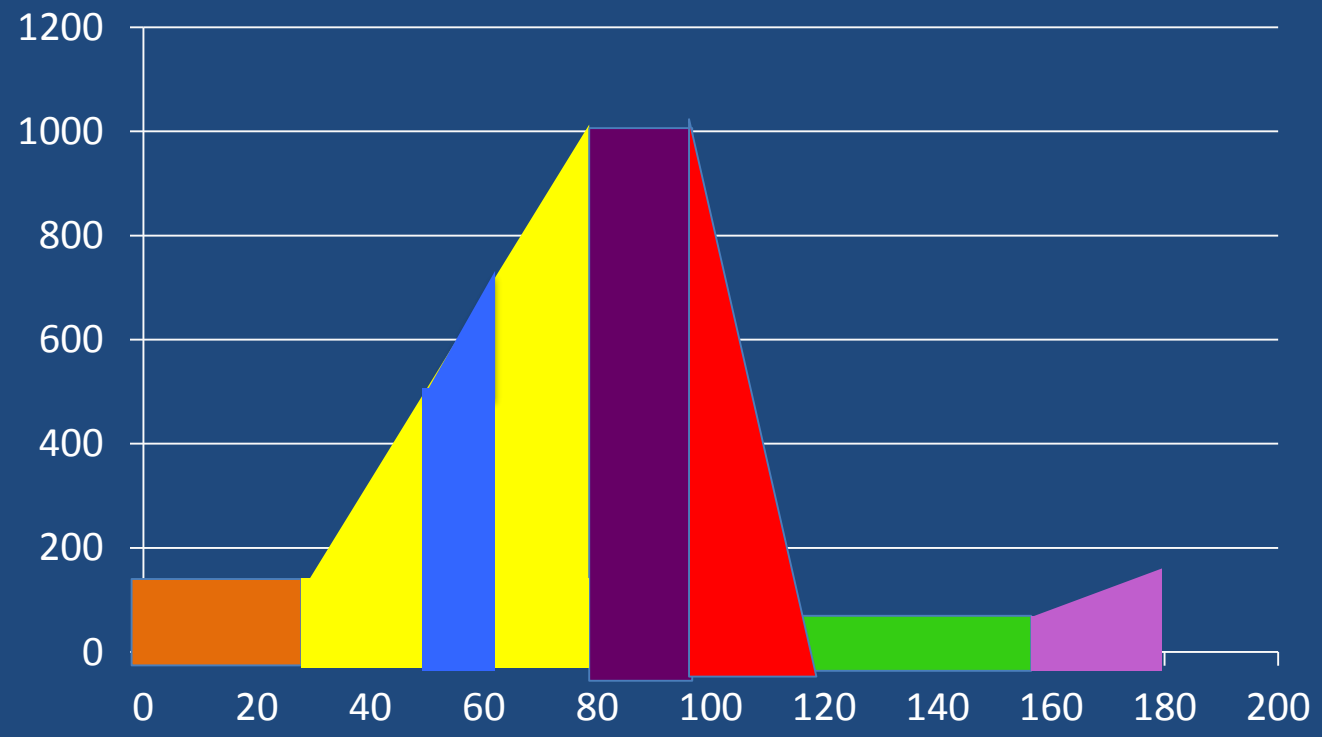
Centrifugal cycle (early wash)



Filling

Acceleration

Washing

Centrifugation

Breaking

Discharge

Screen wash

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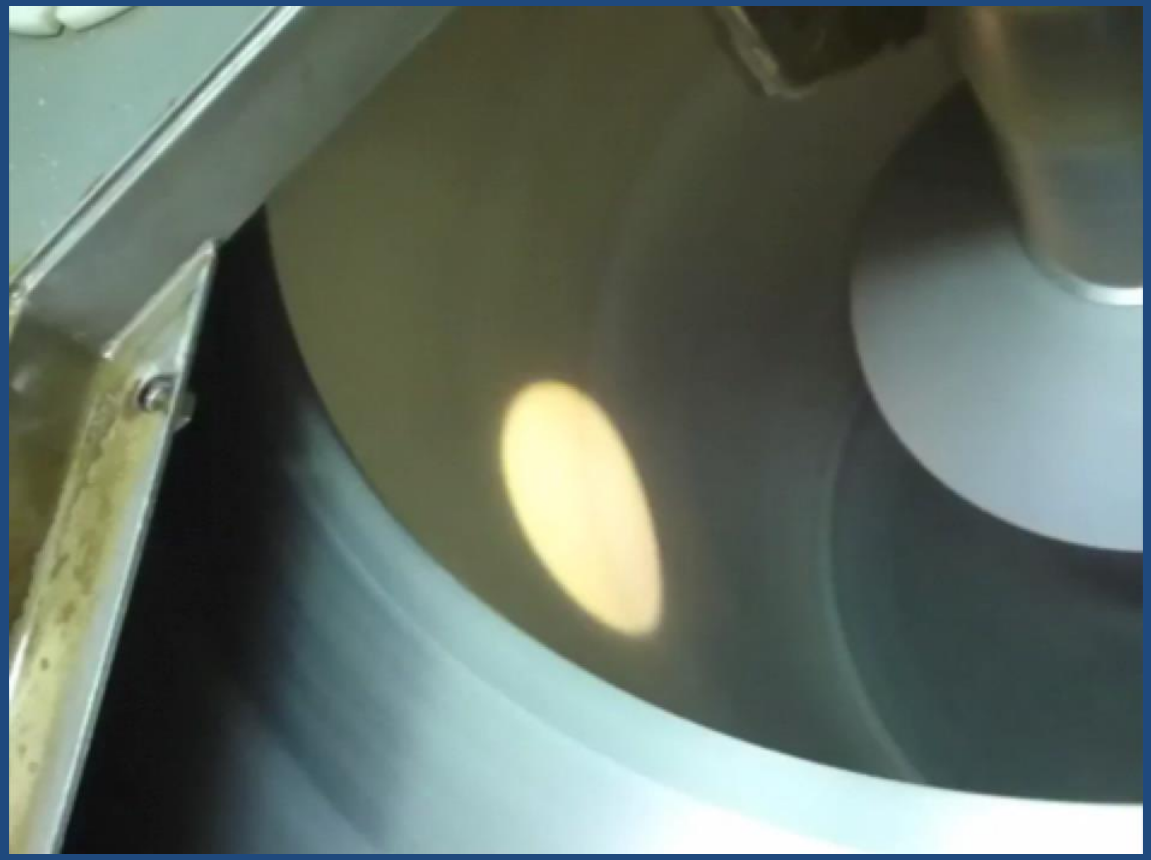

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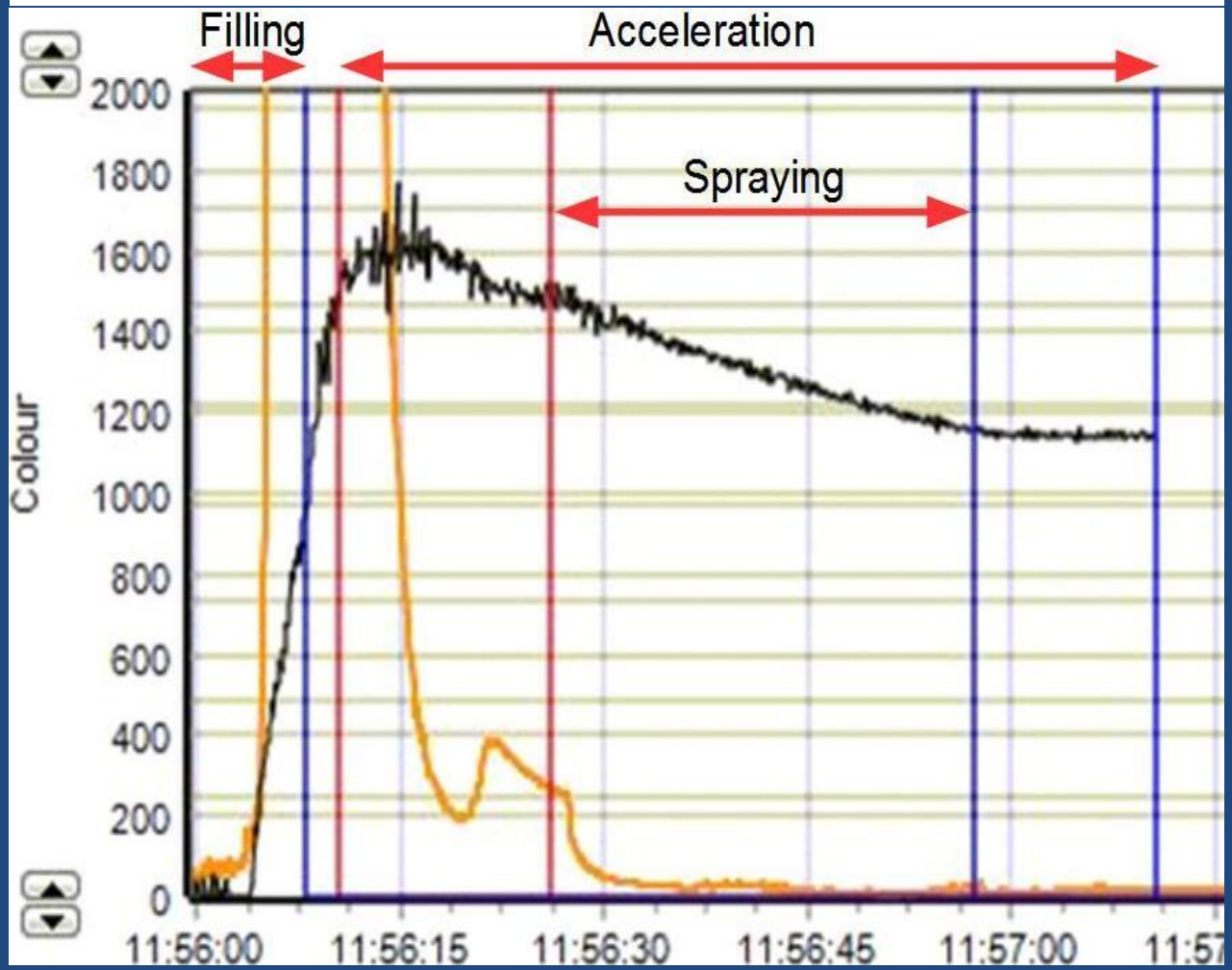
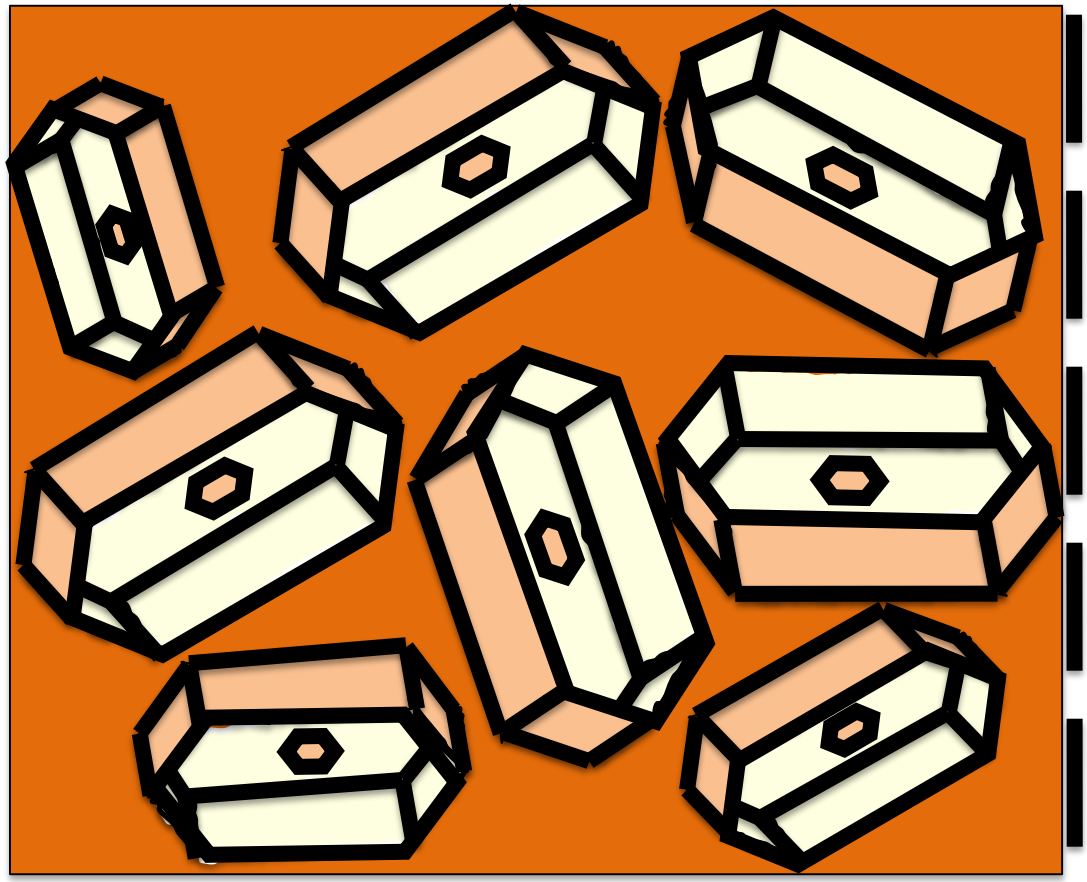
Expected colour profile



Colour

Filling



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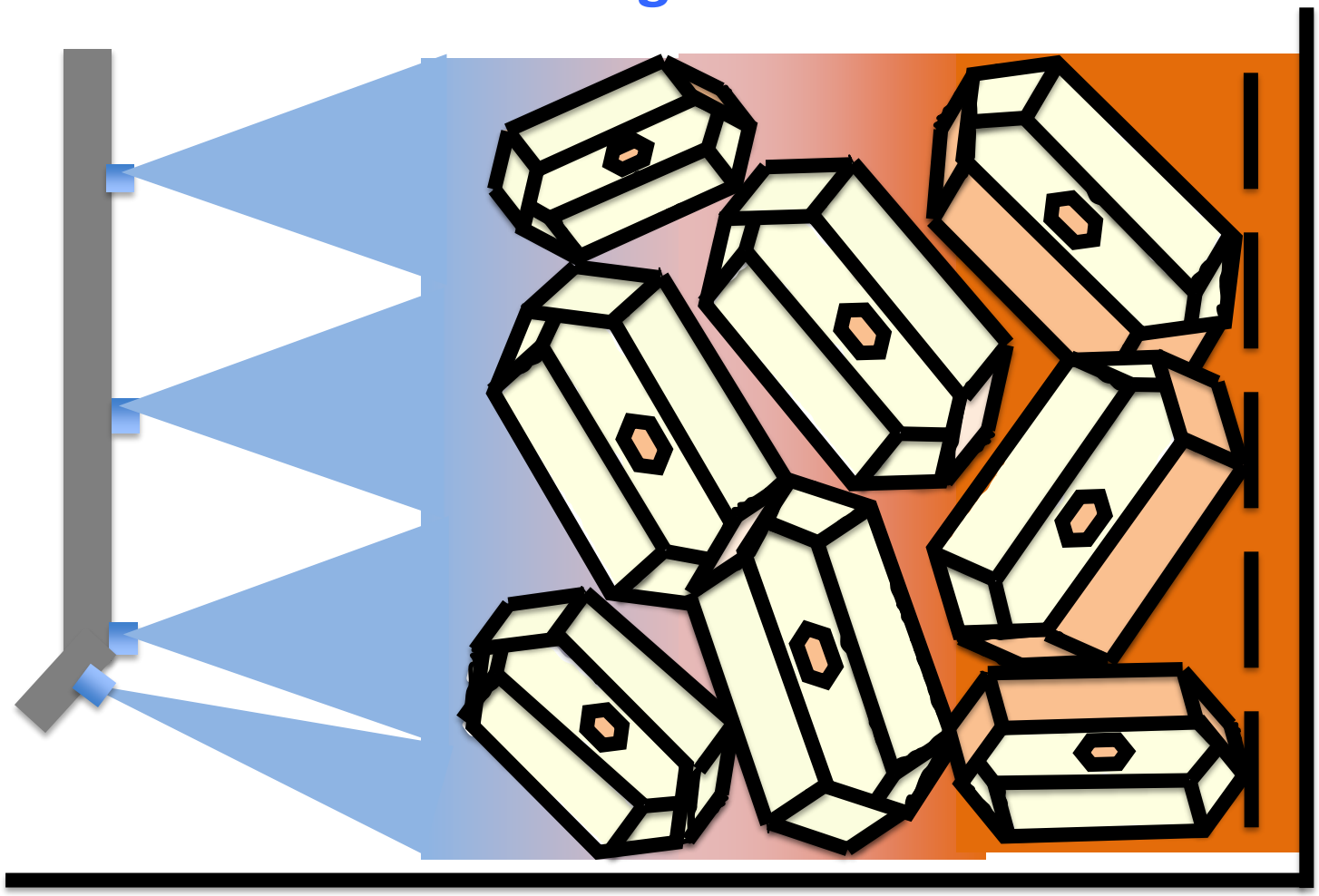
Washing



Mother liquor

Wash syrup

Wash water

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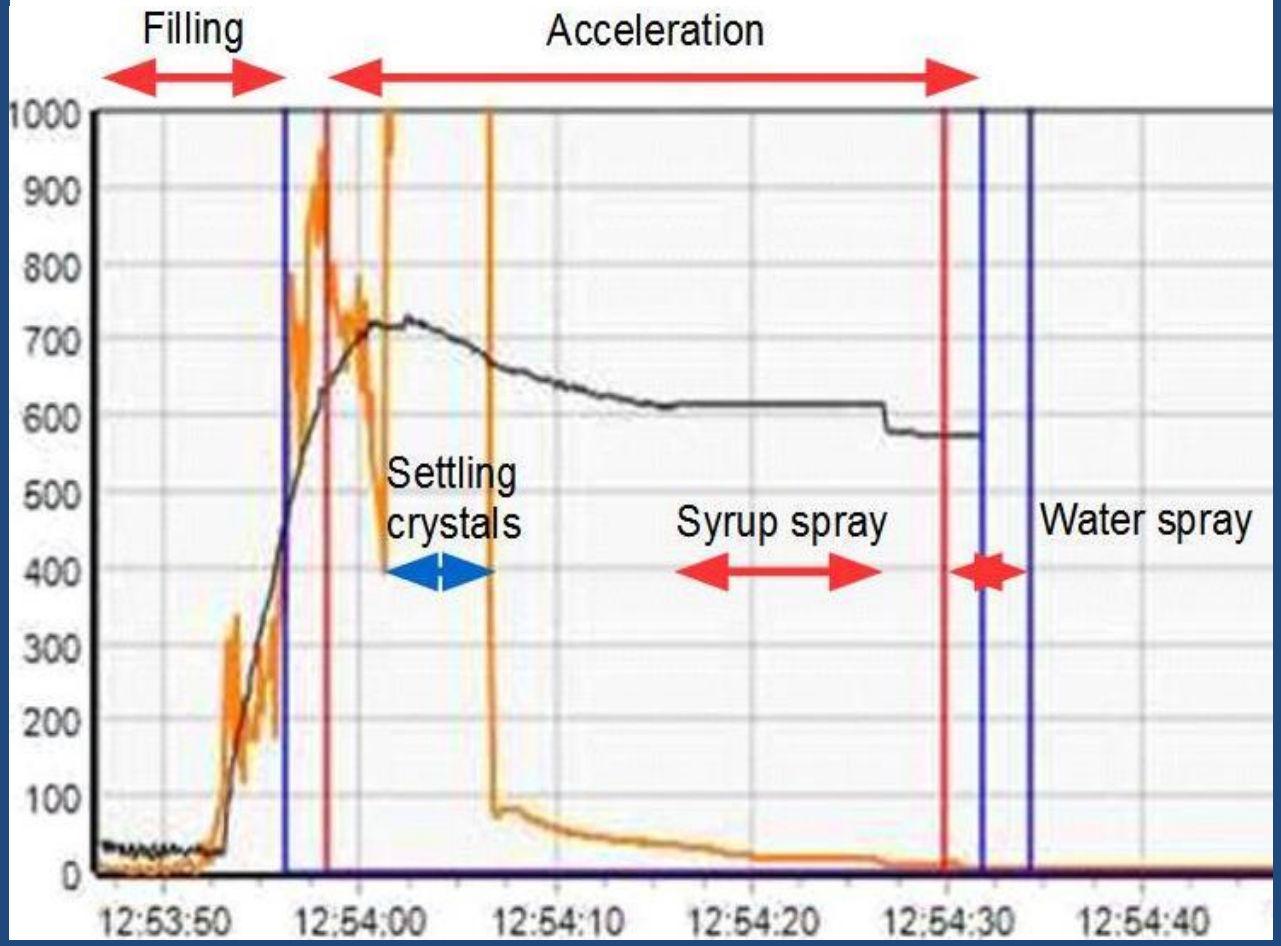
Colour increase during acceleration



Colour

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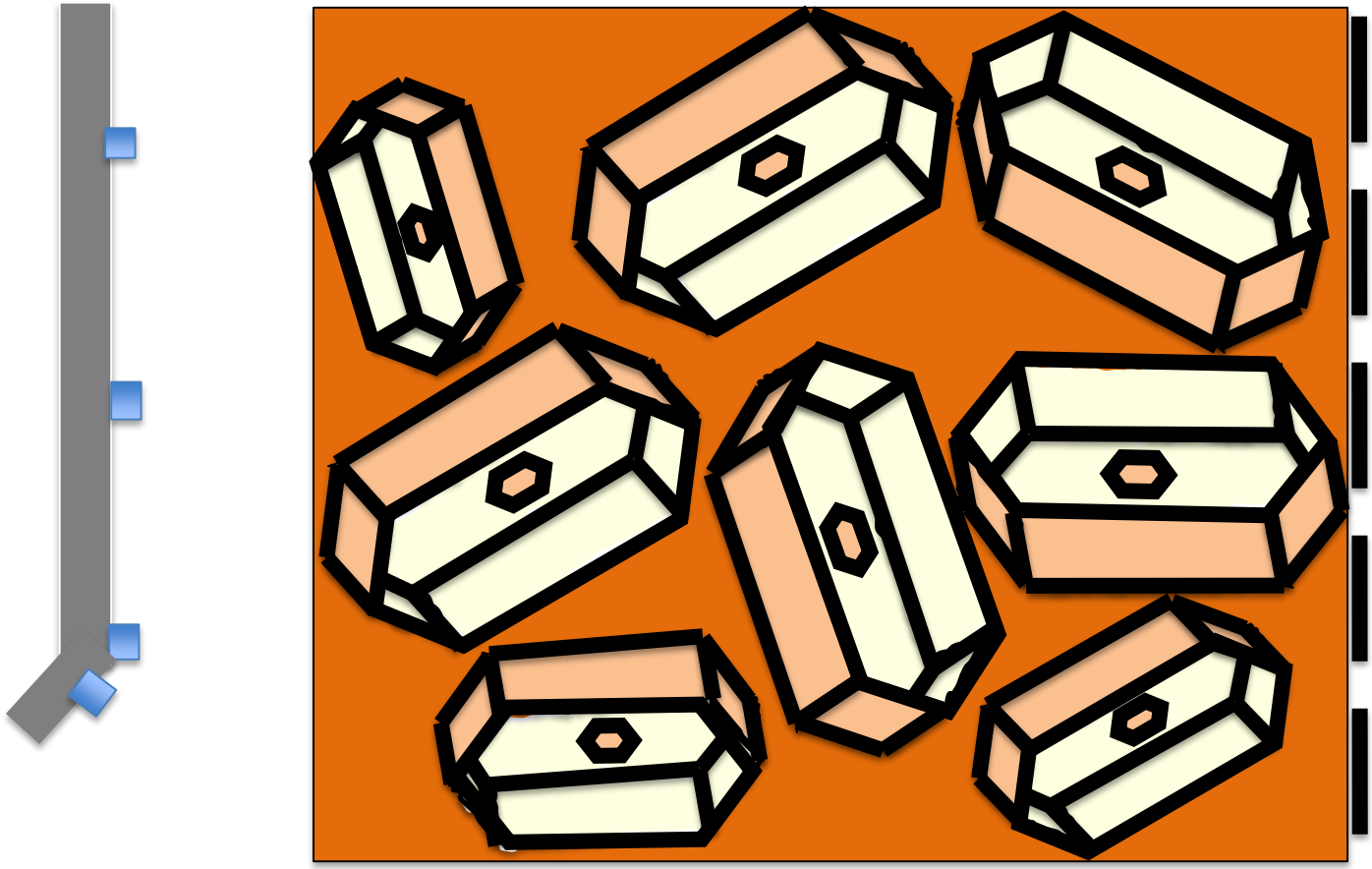
Filling



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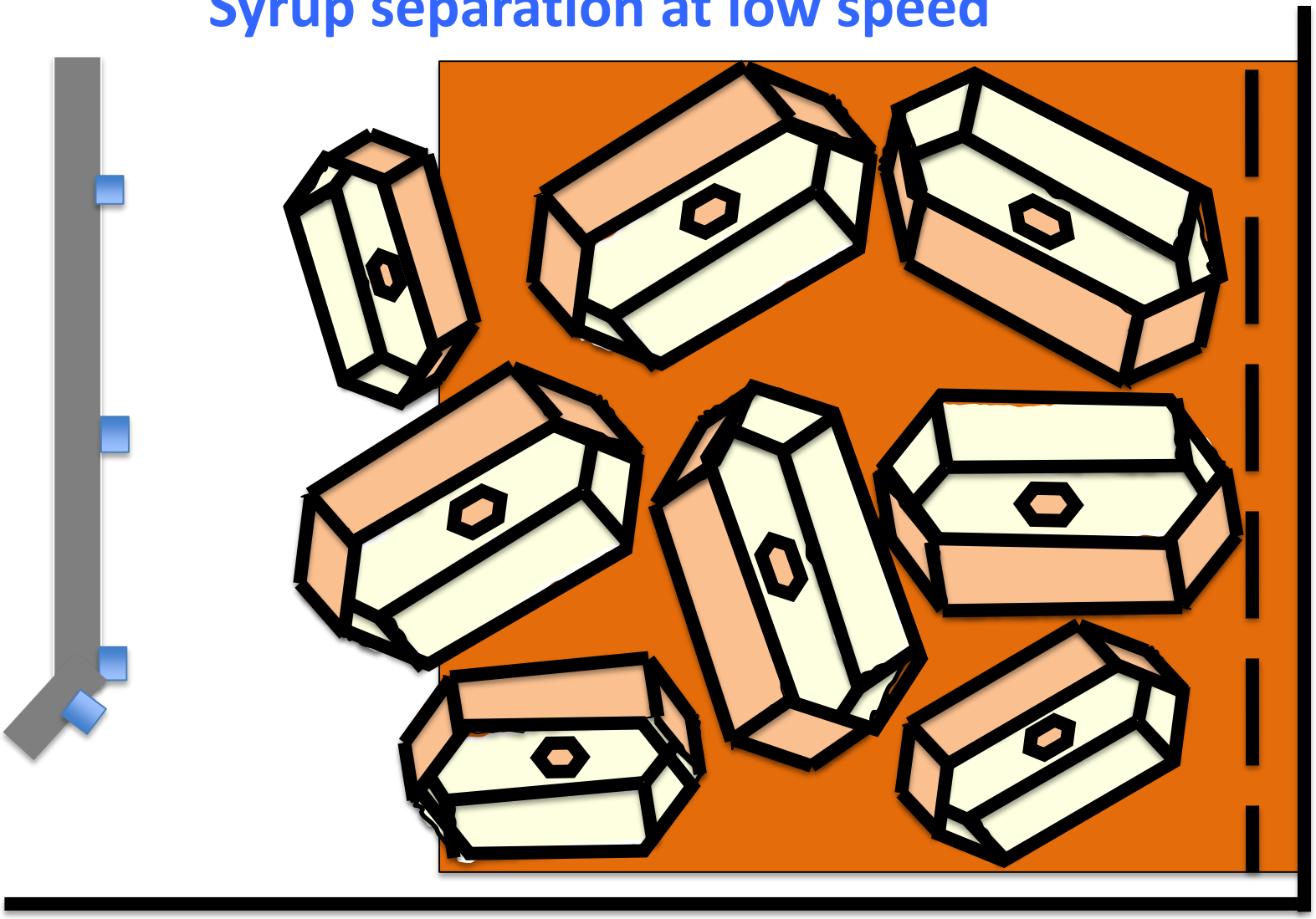
Syrup separation at low speed



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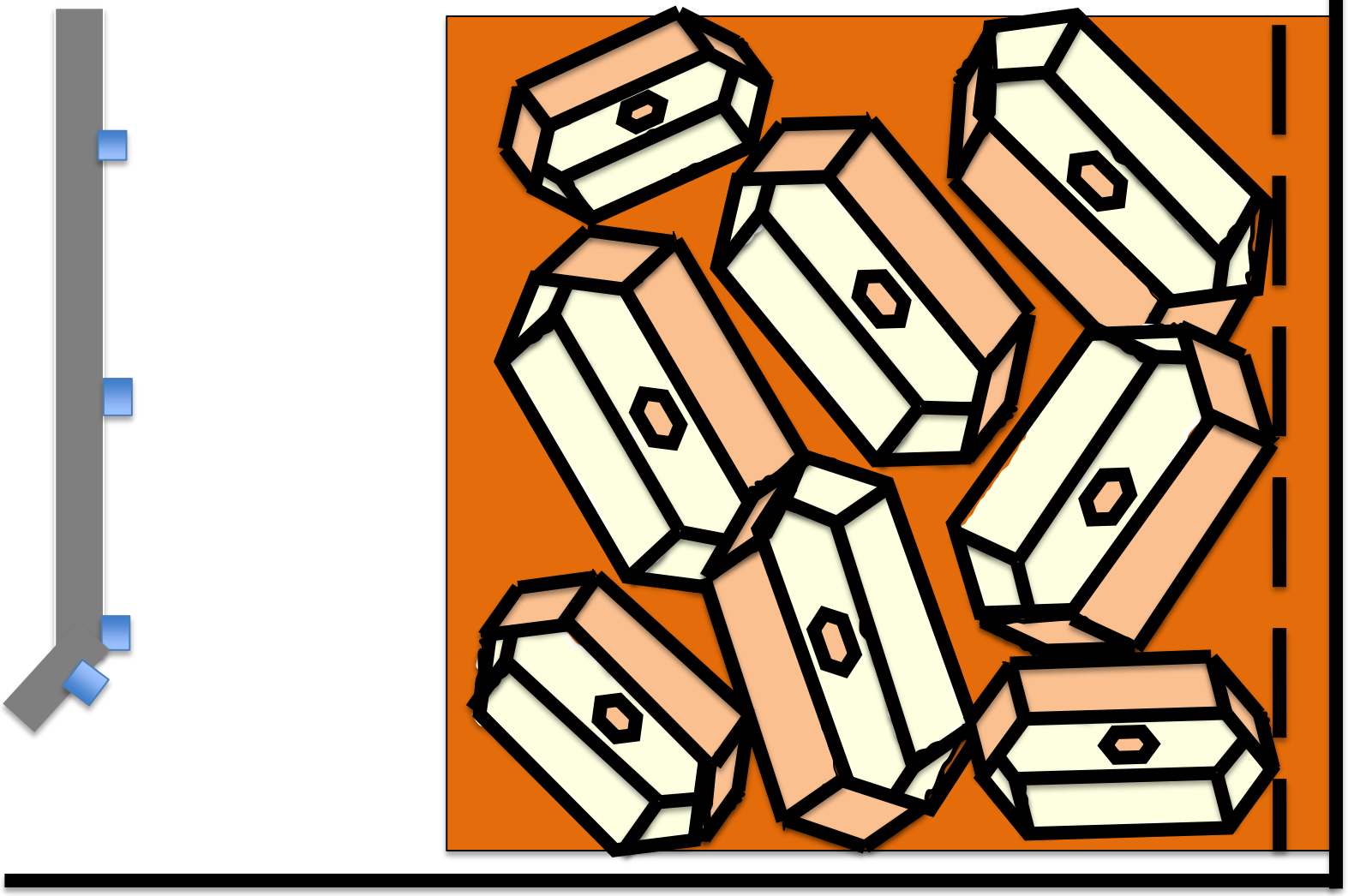
Compactation during acceleration



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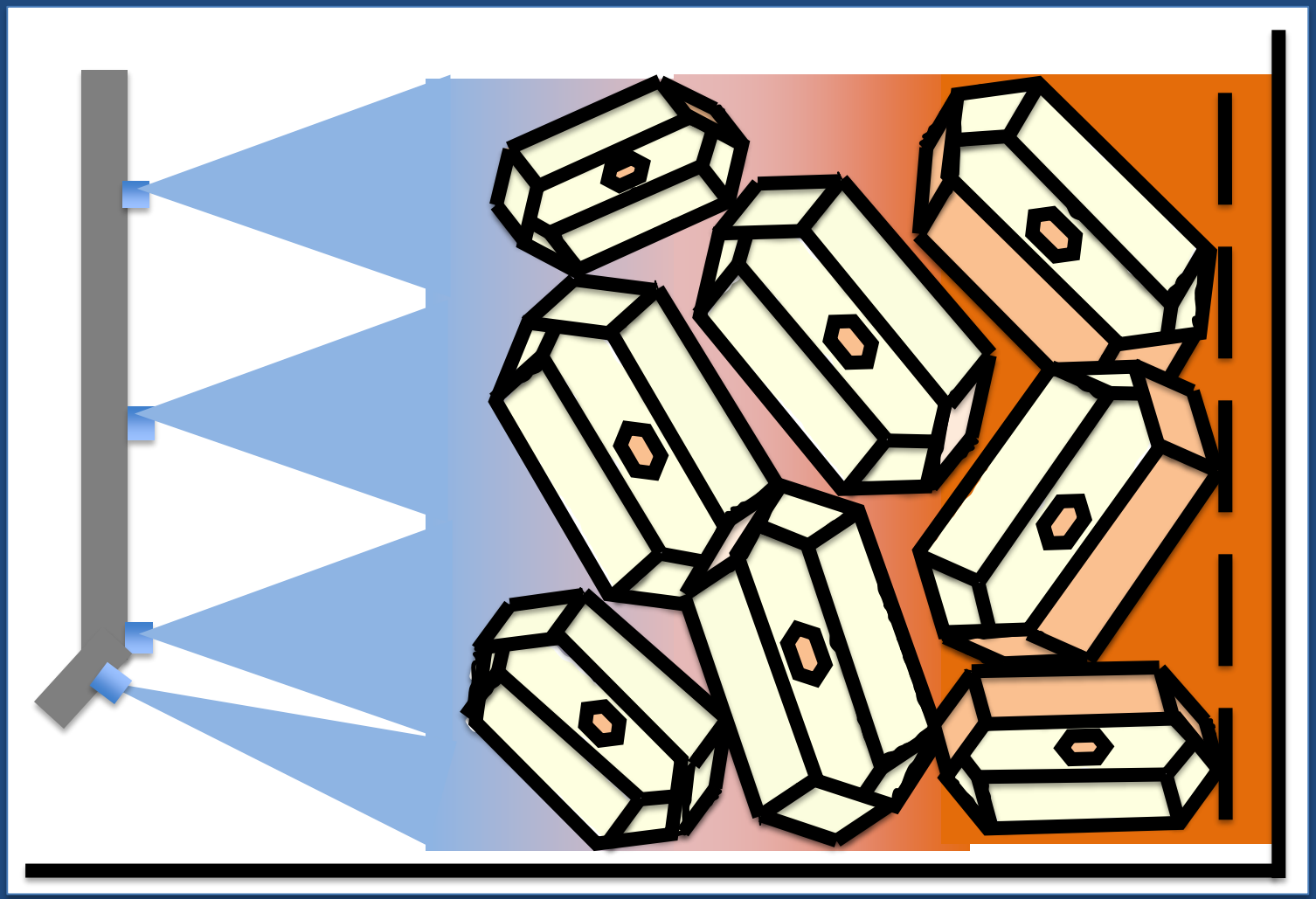

Mother liquor

Wash syrup

Wash water

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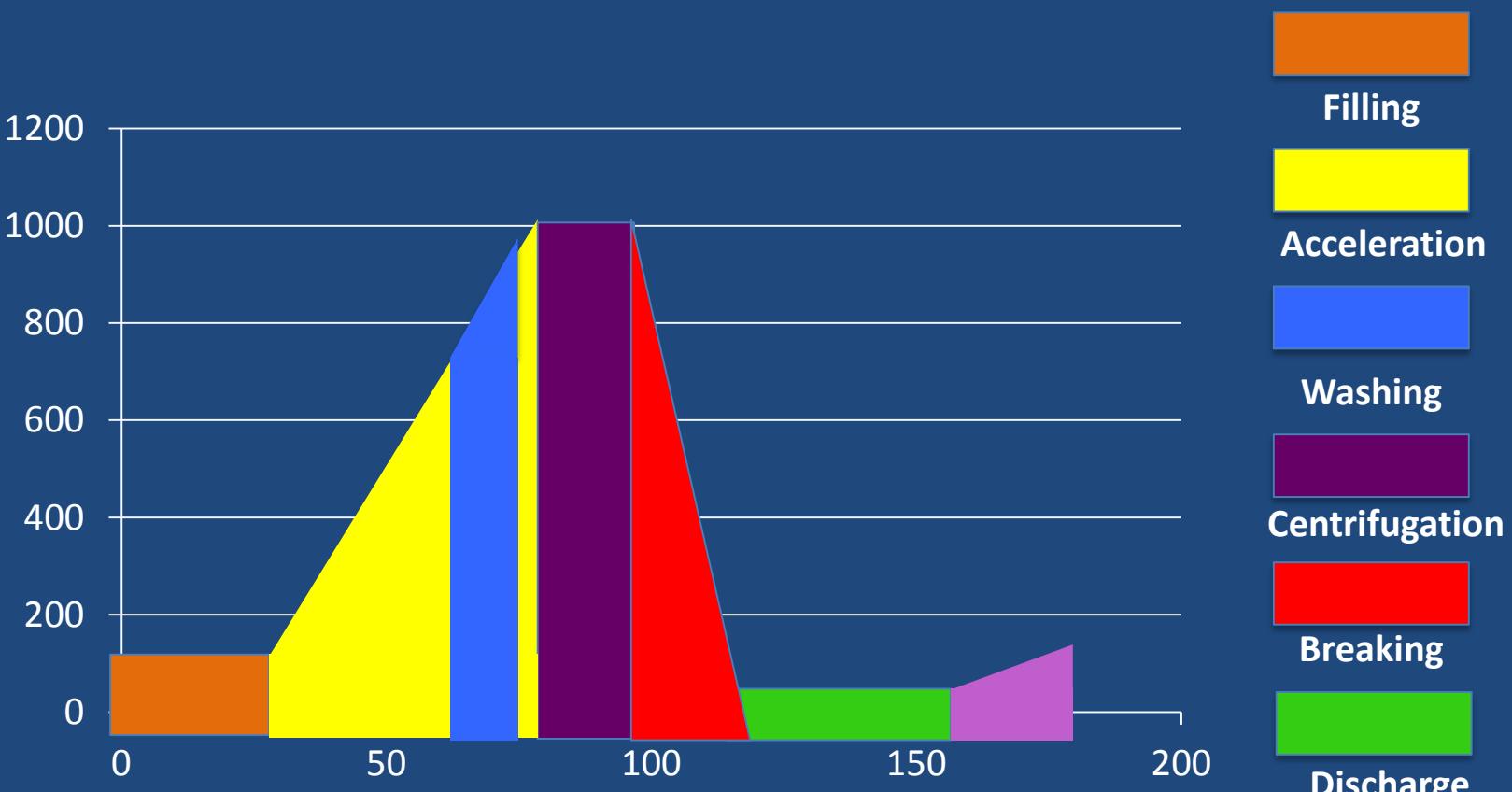

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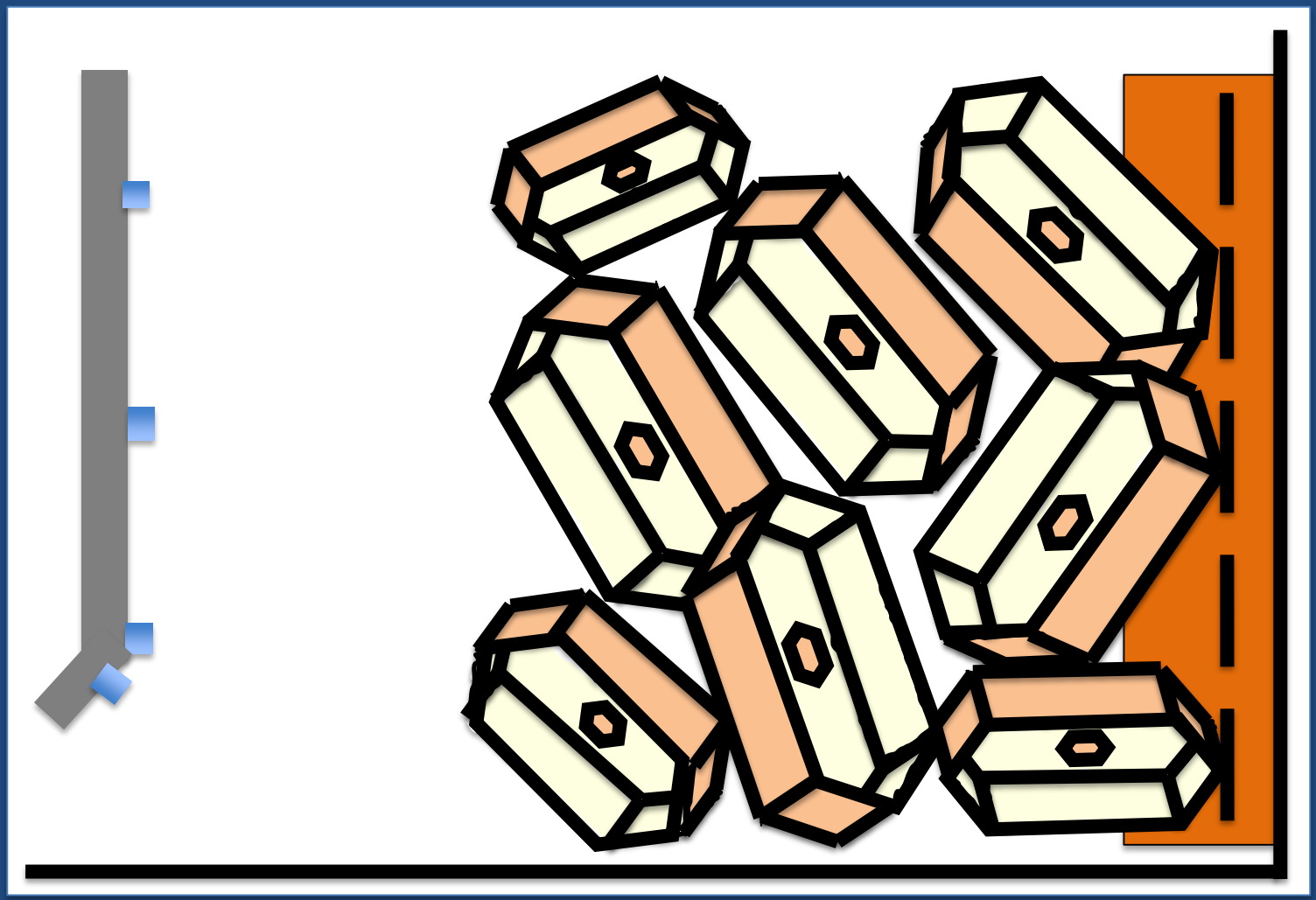

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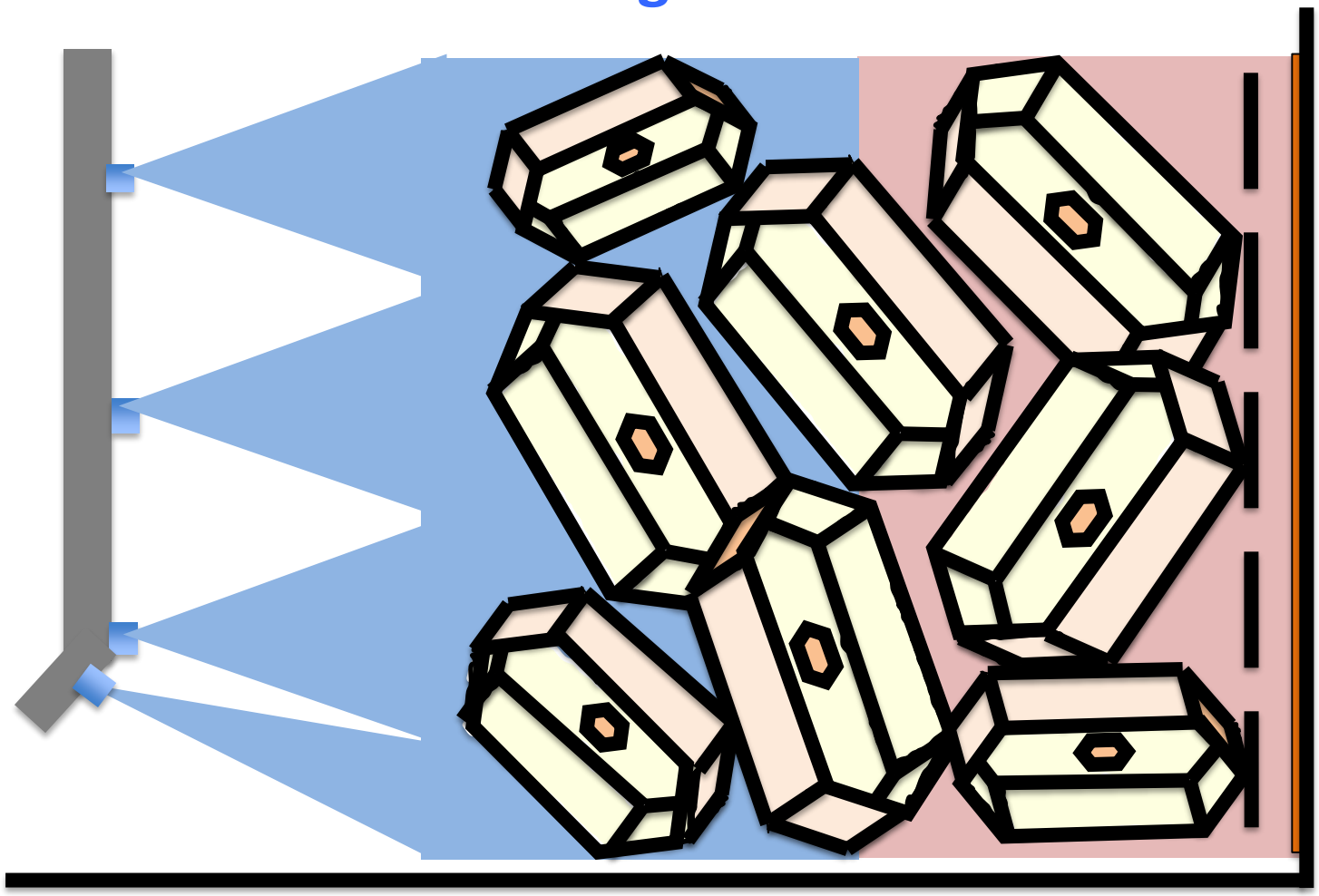
Washing



Wash syrup

Wash water

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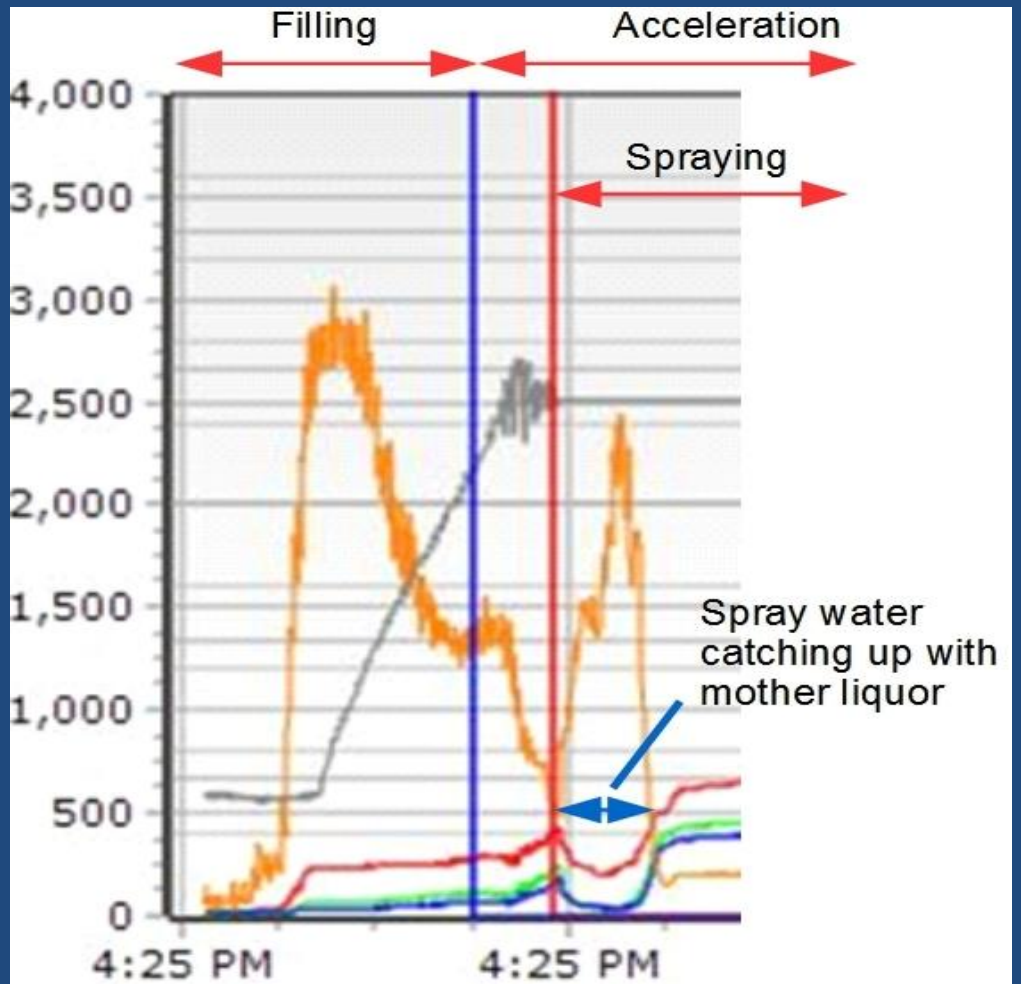
Colour increase during spraying



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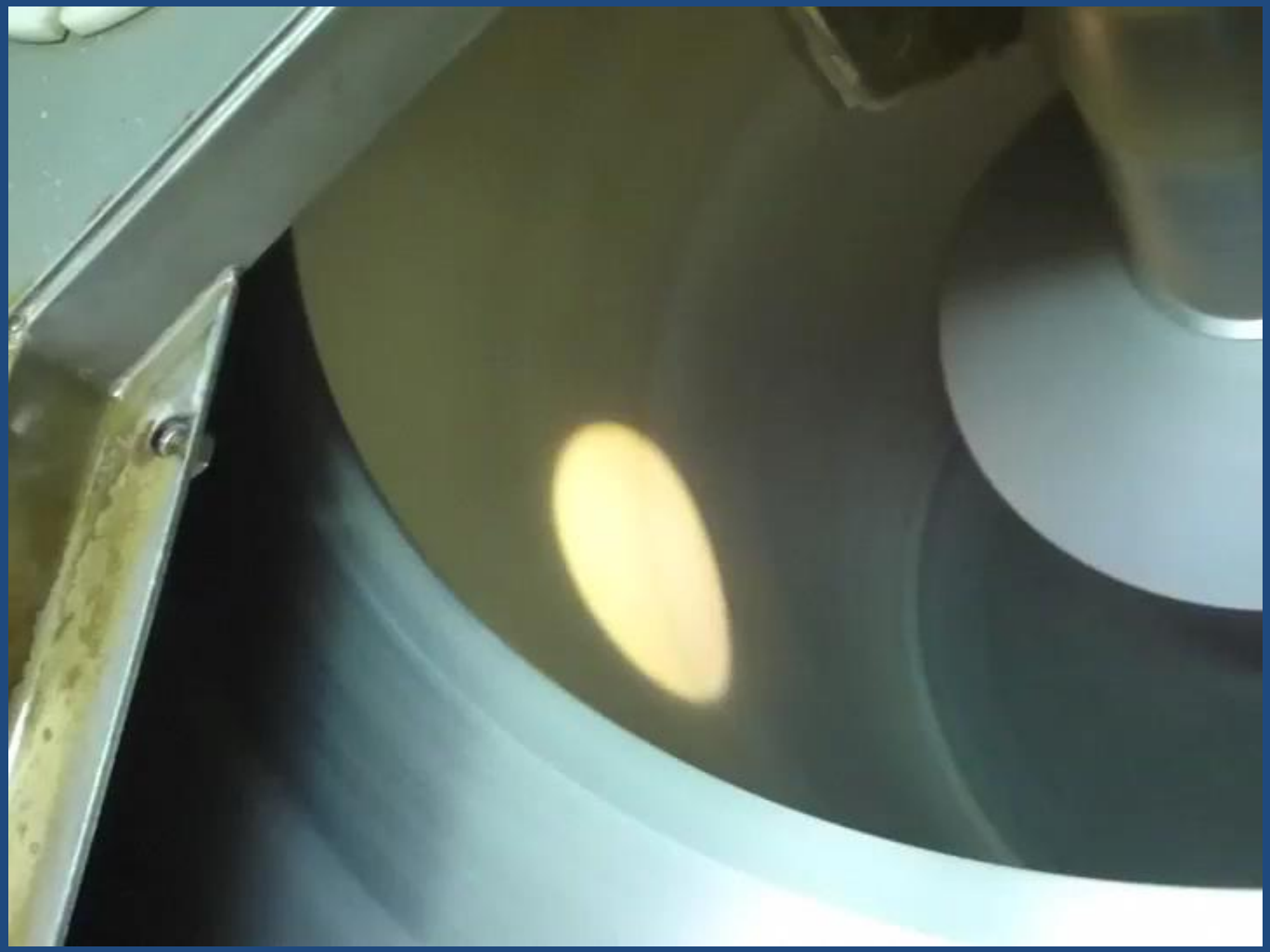

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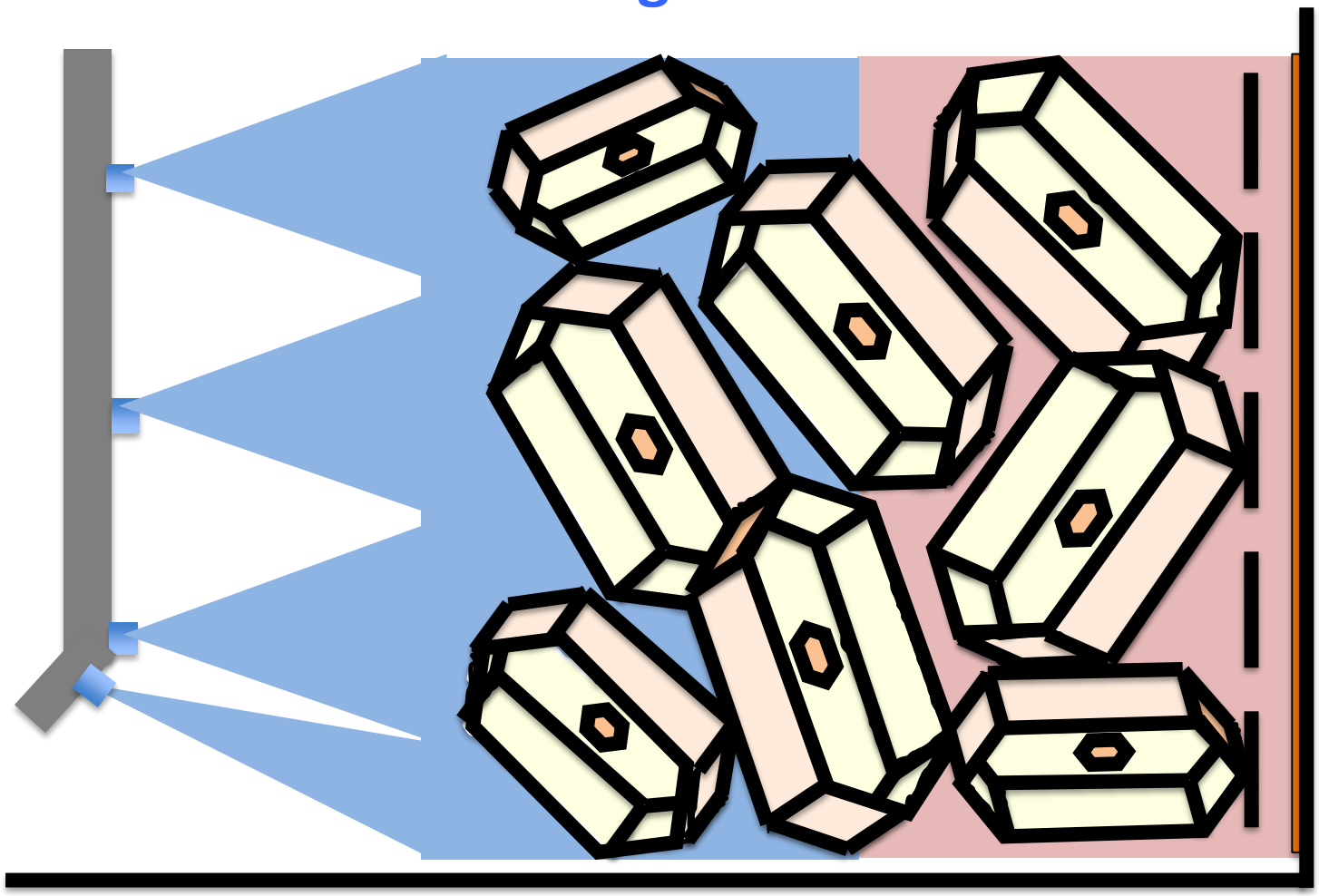
Washing



Wash syrup

Wash water

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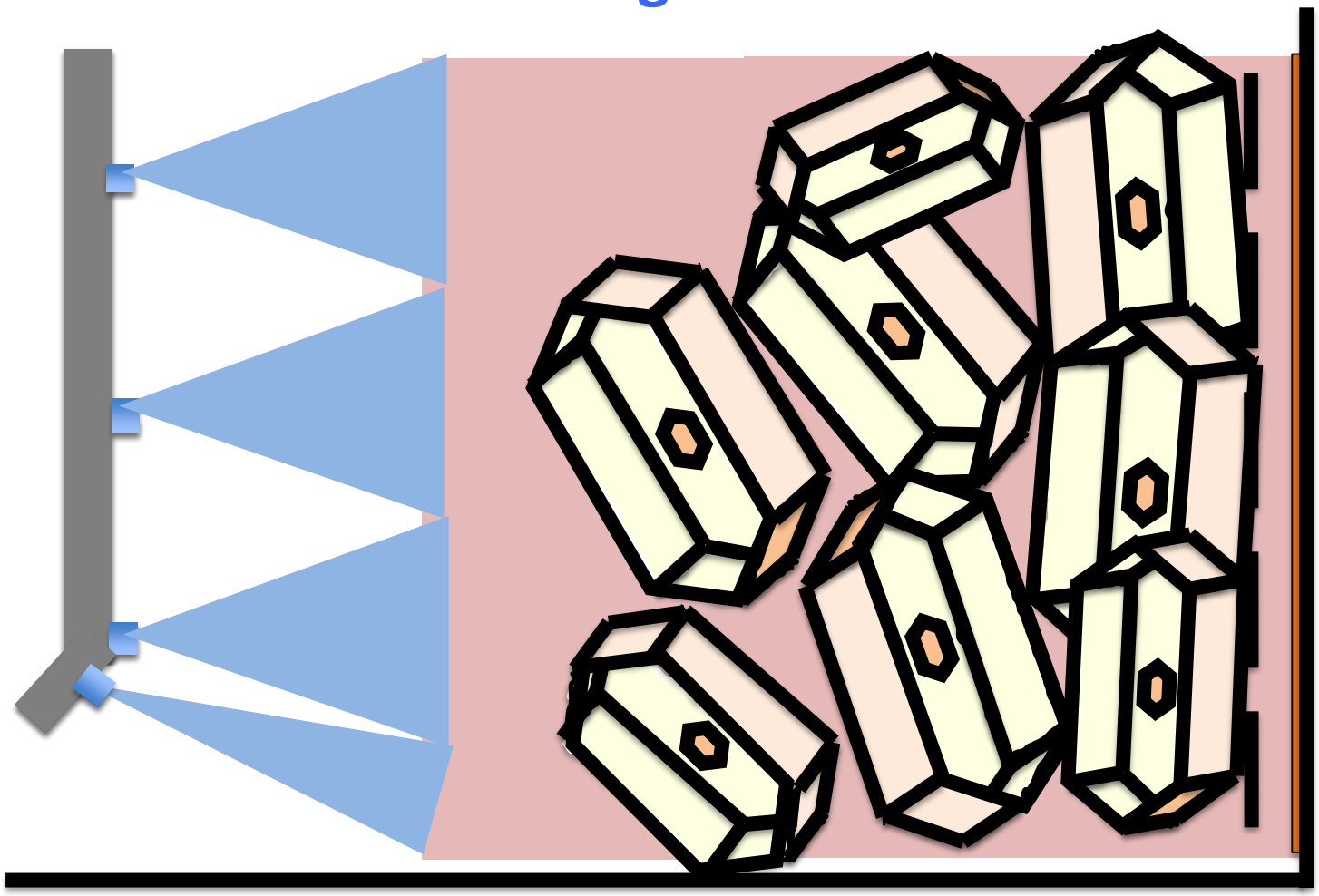
Washing



Wash syrup

Wash water

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Colour measurement for sugar delivered by continuous centrifugals

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Which factors do have an influence on the efficiency of continuous centrifugals?

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Factors influencing the work in continuous centrifugals

Viscosity

Crystal content

Crystal size

Crystal size distribution

Water addition

Steam addition

Massecuite temperature

Feed rate

Due to the various influencing parameters, the molasses losses can not be controlled. Optimization can only be aproached by trial and error.

Continuous centrifugals need continuous attention by the operator

Payne (1992)

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Quality control for sugar delivered by continuous centrifugals

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The extent to which the water and steam mix with the mother liquor to reduce the viscosity and the extent to which the water and steam washes the molasses film off the crystal is unknown

(Peter Rein, Cane Sugar Handbook 2007)

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Typical centrifugal control for continuous centrifugals

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Centrifugal control for continuous centrifugals By using the Neltec ColourQ 1700

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