Boiling House Recovery: Actual, Basic and Reduced (Noël Deerr)

Actual boiling house recovery, basic BHR at 28.57 molasses purity and Noël Deerr's reduced BHR to 85 purity from juice purity and sugar made.

Method: Basic BHR = 100 (J − 28.57)/[J (100 − 28.57)]; Noël Deerr reduced BHR: R85 = 100 (85 − Mv)/[85 (100 − Mv)]; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Mixed juice purity	84.000	%
Pol in mixed juice % cane	13.000	%
Sugar made % cane (recovery)	11.000	%
Pol % sugar	99.700	%

Calculated results

Parameter	Value	Unit
Actual boiling house recovery	84.362	%
Basic BHR (molasses purity 28.57)	92.381	%
Virtual molasses purity	45.086	%
Reduced BHR to 85 juice purity (Noël Deerr)	85.511	%

Notes for this case

- Reduced BHR removes the effect of juice purity so seasons and factories compare.
- The actual BHR is well below the basic BHR: losses or stock changes are large, or an input is off.

Formula and method

$$BHR = \frac{Pol_S\, R}{Pol_{MJ,c}}, \quad BBHR = \frac{J - 0.2857}{J(1 - 0.2857)}$$

$$M_v = \frac{J(1 - BHR)}{1 - BHR\, J}, \quad R_{85} = \frac{0.85 - M_v}{0.85\,(1 - M_v)}$$

Variables

J	Mixed juice purity	-
$Pol_{MJ,c}$	Pol in mixed juice % cane	-
R	Sugar made % cane (recovery)	-
Pol_S	Pol % sugar	-
BHR	Actual boiling house recovery	-
$BBHR$	Basic BHR (molasses purity 28.57)	-
M_v	Virtual molasses purity	-
R_{85}	Reduced BHR to 85 juice purity (Noël Deerr)	-

Method and standards

Recovery definitions.

Assumptions and limits

- Purities as fractions.

- The actual BHR uses the measured pol of the sugar, while M_v and R85 follow the standard form, which takes the sugar as pure (purity 100); the two bases are mixed as in the DMR practice.
- A note appears when M_v exceeds 85 (negative R85) or the actual BHR is far below the basic BHR.

References

- Basic BHR = 100 (J − 28.57)/[J (100 − 28.57)]
- Noël Deerr reduced BHR: R85 = 100 (85 − Mv)/[85 (100 − Mv)]
- Mv = 100 J (1 − R)/(100 − R J)
- Sugar factory chemical control (daily manufacturing report) definitions
- as compiled in SugarProcessTech
- Formulas for calculating sugar industry DMR

Report details

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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/sugar-ethanol/chemical-control/boiling-house-recovery

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Reopens the calculator with the inputs of this report.