Recycled Fibre Deinking: Yield and Rejects

Deinking plant yield, rejects and sludge from recovered paper input, its moisture and ash, and the ash removed in flotation and washing.

Method: Smook; Handbook for Pulp & Paper Technologists; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Recovered paper (as received)	600.00	t/d
Moisture in recovered paper	10.000	%
Ash in the recovered paper (dry)	18.000	%
Ash in the deinked pulp (dry)	4.0000	%
Fibre (ash-free) lost to rejects	8.0000	%

Calculated results

Parameter	Value	Unit
Dry recovered paper	540.00	t/d
Deinked pulp (dry)	424.35	t/d
Yield on dry recovered paper	78.583	%
Rejects and sludge (dry)	115.65	t/d

Notes for this case

- Most of the yield loss is filler ash removed to brighten the pulp; ash leaving in the pulp counts as product.

Formula and method

$$\dot{m}_{OD} = \dot{m}_{RP}(1-w), \quad \dot{m}_p = \frac{\dot{m}_{OD}(1-a_{in})(1-L_f)}{1-a_{out}}$$

Variables

$\dot{m}_{RP}$	Recovered paper (as received)	kg/s
w	Moisture in recovered paper	-
a_{in}	Ash in the recovered paper (dry)	-
a_{out}	Ash in the deinked pulp (dry)	-
L_f	Fibre (ash-free) lost to rejects	-
$\dot{m}_{OD}$	Dry recovered paper	kg/s
$\dot{m}_p$	Deinked pulp (dry)	kg/s
Y	Yield on dry recovered paper	-
$\dot{m}_s$	Rejects and sludge (dry)	kg/s

Method and standards

Ash-free fibre balance.

Assumptions and limits

- Ash and fibre balances only.
- Ash leaving in the pulp cannot exceed the ash fed; inputs that would need more are rejected.

References

- Smook
- Handbook for Pulp & Paper Technologists

- 3rd ed. (Angus Wilde, 2002)
- ch. 14 (recycled fibre: deinking yield and losses)

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/chemical/pulp-paper/deinking-yield

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.