New recovered paper pulping strategy using intermediate fractionation - cooperation with SSCCP

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Background

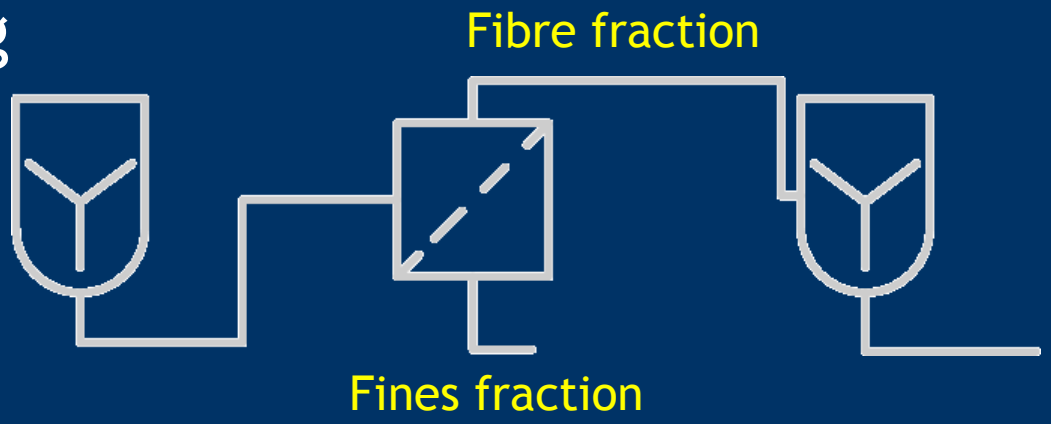
- Purpose of deinking pulping is to
  - detach ink from fibres
  - achieve complete defibering
  - BUT, not to dissolve printing ink binder
- Removal of small-sized ink is difficult during flotation deinking
  - Excessive ink fragmentation should be avoided

Objectives

- Objectives were to compare
  - direct pulping process

  to

  - sequential pulping process having intermediate fractionation



Materials & methods

- Raw material:
  - Flexographic ONP 10%
  - Offset ONP 90%

- True-neutral pulping conditions

Results - ink fragmentation

- Direct pulping process (10 min)

Residual ink 1385 ppm
Brightness 41.1 %

- Sequential pulping process (2+8 min)

Residual ink 660 ppm
Brightness 48.7 %

After first pulping stage

Results - attached ink

- Direct pulping process (10 min)

Residual ink 479 ppm
Brightness 46.3 %

- Sequential pulping process (2+8 min)

Residual ink 196 ppm
Brightness 52.2 %

After first pulping stage

Results - attached ink

- Direct pulping process (10 min)

Residual ink 479 ppm
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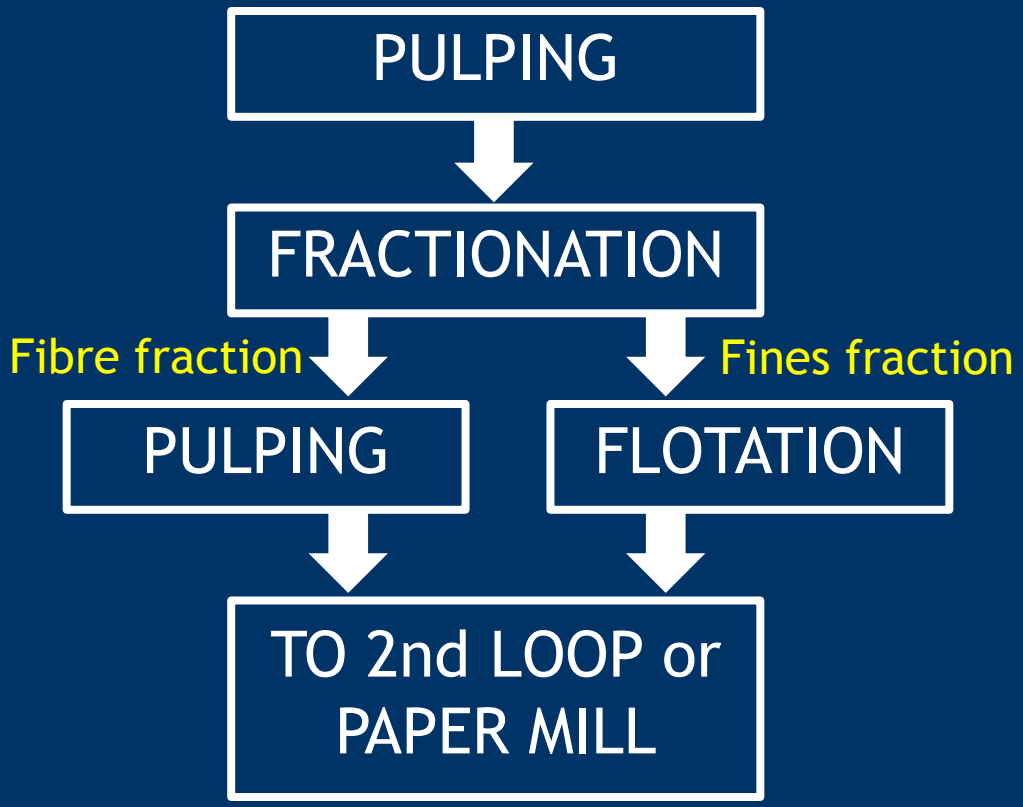
After second pulping stage

Fractional deinking concept for newsprints



Conclusions

- Newsprint inks has reasonably high tendency to fragment and redeposit (higher for flexo)
- True-neutral, very short pulping
  - Ink fragmentation and redeposition avoided
  - Suffers from incomplete defibering
- Fractional process with sequential pulping at true-neutral chemical environment
  - Ink fragmentation and redeposition avoided
  - Complete defibering achieved

Further information

- Körkkö M, Bussini D, Laitinen O, Elegir G & Niinimäki J (2011) True-neutral fractional deinking for flexographic and offset newsprints. Proc 65th Appita Annual Conference and Exhibition. Carlton, Appita: 23-30.
- Kemppainen K, Körkkö M & Niinimäki J (2011) Fractional pulping of toner and pigment-based inkjet ink printed papers - ink and dirt behavior. BioResources 6(3): 2977-2989.
- Kemppainen K, Körkkö M, Haapala A, Illikainen M & Niinimäki J (2010) Benefits of fractionation during pulping. Proc TAPPI PEERS Conference and 9th Research Forum on Recycling. Atlanta GA, TAPPI: Conf. CD.

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Thank you for your attention!

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