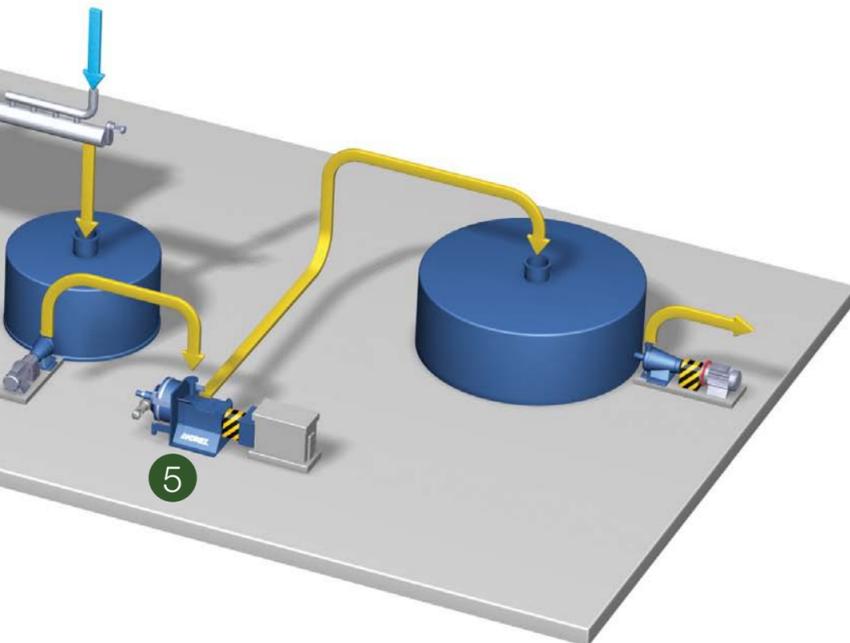


5 Optimized low-consistency refining Option 2
Energy efficiency in HC/LC refining stages

Low specific energy consumption and well developed fibers after primary refining stage enable use of efficient LC refiners in second stage and rejects treatment.

- Further reduction of specific energy consumption compared to the HC refiner
- Simplified process, easy operation and minimum maintenance
- Excellent pulp property development in LC refiner

The world's largest LC refiner – the TwinFlo TF72 ▶



P-RC APMP

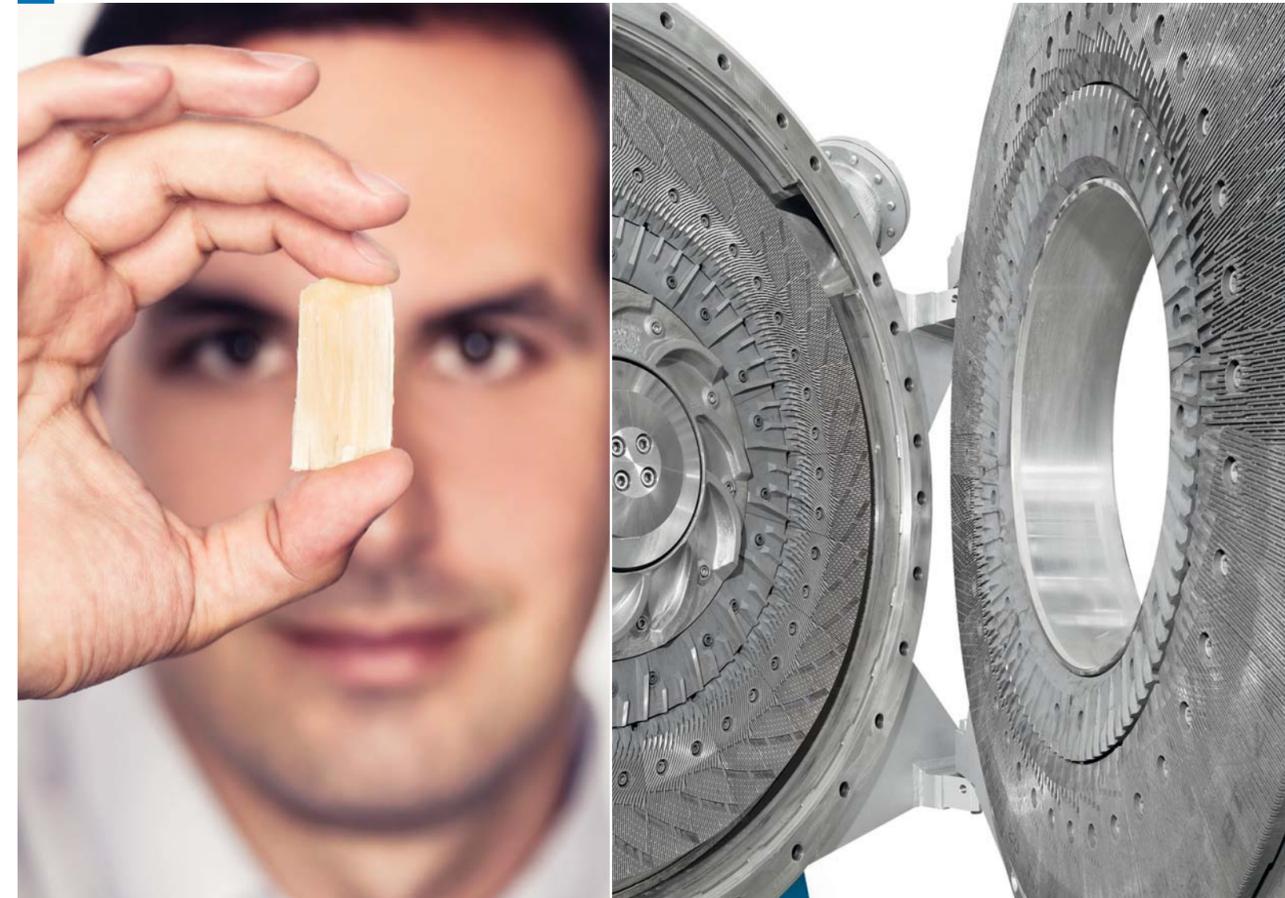
Improved performance and profitability

Benefits:

- Minimum specific energy consumption
- High chemical efficiency
- Low operating costs
- High process yield
- Superior pulp quality
 - High tensile strength at high bulk
 - Excellent optical properties – brightness, light scattering, opacity
- Minimum generation of COD and BOD
- Sulfur-free process leads to improved bio-degradability of pulp mill effluents
- Reduction of greenhouse gas emissions (CO₂) due to low specific refining energy consumption
- Flexible operation: wide range of pulp grades and wood species
- Optimized and reliable equipment for a wide range of applications
- Proven in many installations

P-RC APMP

A closer look on high-quality fibers at lowest operating costs



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The challenge: Producing high-quality fiber at the lowest operating cost

The ANDRITZ P-RC APMP (Pre-conditioning Refiner Chemical Alkaline Peroxide Mechanical Pulp) process is an advanced technology for the production of high-quality chemi-mechanical pulps. This environmentally friendly process is designed to meet today's and tomorrow's market requirements for high-quality paper and board products at maximum production efficiency.

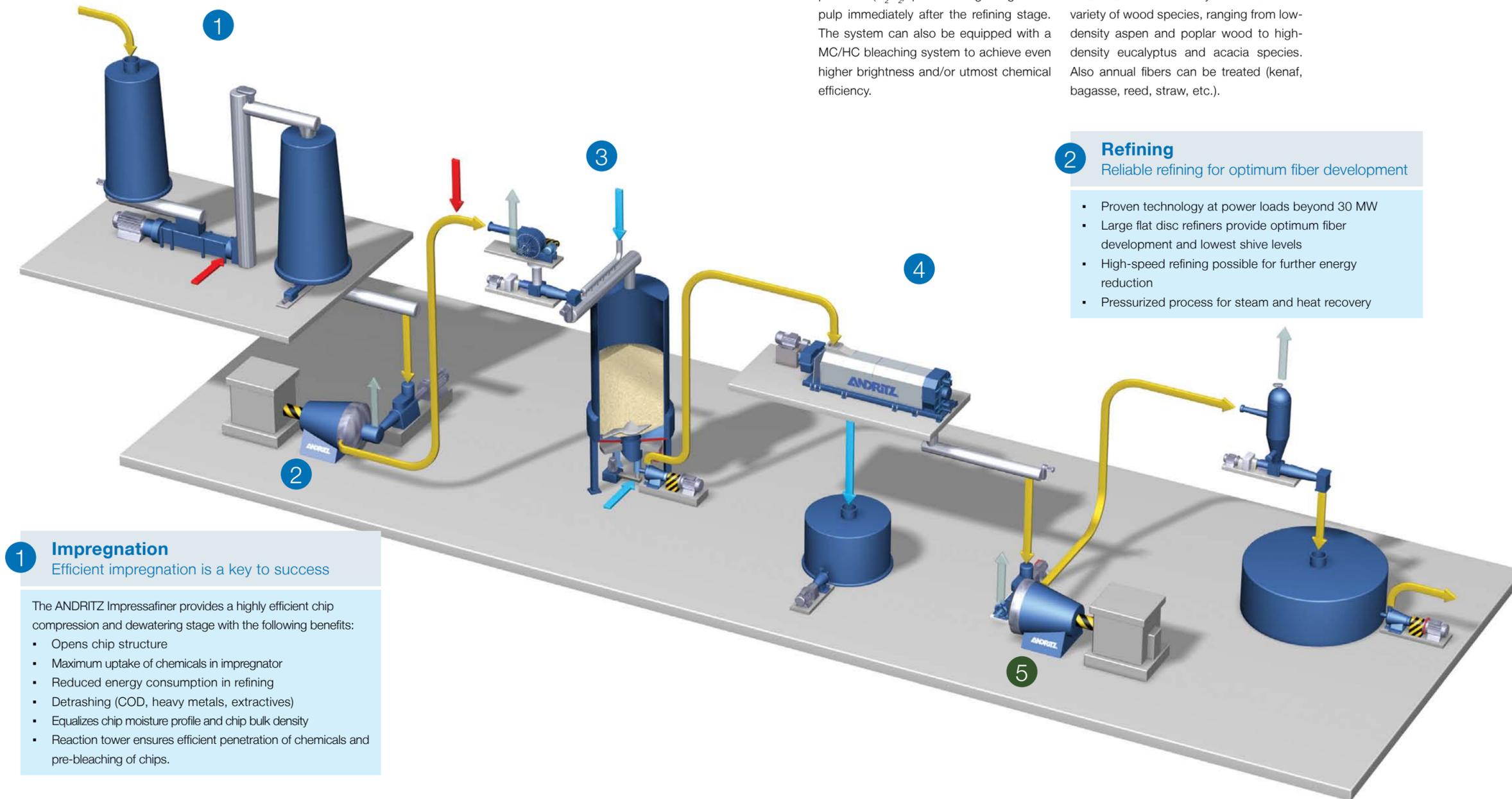
The solution: The ANDRITZ P-RC APMP system

The application of alkali (NaOH) in an efficient impregnation stage prior to refining leads to a significant reduction of refining energy.

The simultaneous addition of hydrogen peroxide (H₂O₂) provides high-brightness pulp immediately after the refining stage. The system can also be equipped with a MC/HC bleaching system to achieve even higher brightness and/or utmost chemical efficiency.

With the flexible P-RC APMP process, it is possible to produce a wide range of pulp grades with superior quality suited for the production of various paper grades: from LWC to printing/writing to board and tissue.

ANDRITZ P-RC APMP systems can use a variety of wood species, ranging from low-density aspen and poplar wood to high-density eucalyptus and acacia species. Also annual fibers can be treated (kenaf, bagasse, reed, straw, etc.).



1 Impregnation
Efficient impregnation is a key to success

The ANDRITZ Impressafiner provides a highly efficient chip compression and dewatering stage with the following benefits:

- Opens chip structure
- Maximum uptake of chemicals in impregnator
- Reduced energy consumption in refining
- Detrashing (COD, heavy metals, extractives)
- Equalizes chip moisture profile and chip bulk density
- Reaction tower ensures efficient penetration of chemicals and pre-bleaching of chips.

2 Refining
Reliable refining for optimum fiber development

- Proven technology at power loads beyond 30 MW
- Large flat disc refiners provide optimum fiber development and lowest shive levels
- High-speed refining possible for further energy reduction
- Pressurized process for steam and heat recovery

3 Chemical addition and bleaching
High brightness with highest chemical efficiency

- Chemicals in the impregnation stage and at the refiner
- Bleaching reaction completed in a high-consistency bleaching tower after refiner
- Alkali efficiently used for wood softening and bleaching
- Flexible in controlling pulp property development
- Pulp efficiently washed after bleaching in a screw press
- High brightness also reached with raw materials considered difficult to bleach

4 Washing
Reduction of COD, extractives, anionic trash

- Cleaner pulp to 2nd stage refiner and to the paper machine or pulp dryer
 - Improved pulp quality and operation of the PM
- Separation of water loops
 - Improved washing efficiency
 - Reduced wash water consumption
- Recovery of residual peroxide and reuse for 2nd stage bleaching

5 High-consistency refining
Optimum pulp quality for low-freeness pulps

Option 1

Value-added low-freeness pulp grades (LWC) and wood species with a high demand for specific energy require a two-stage high-consistency refining process.

- Optimum split of specific energy between primary and secondary refiner
- Optimum fiber development in HC refiner
- Steam generated in the pressurized refiner can be recovered and reused in the process



◀ HC refiner S2070