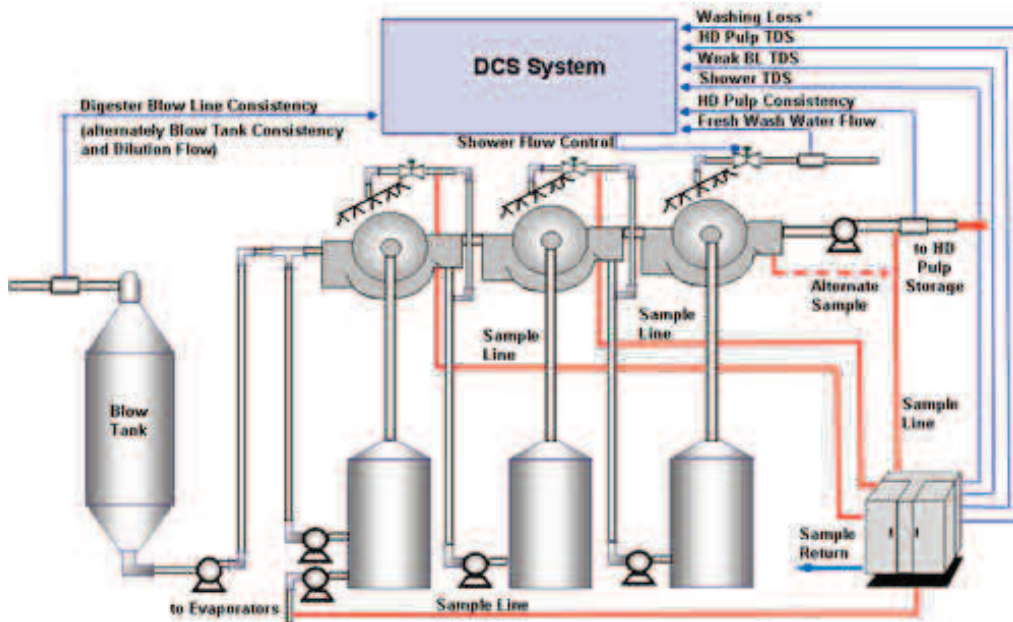


# BROWN STOCK WASHING ANALYZER

*The DURALYZER-NIR Online Analyzer for Washing Plant*

**THE BROWN STOCK WASHING ANALYZER** is the solution for optimizing any countercurrent washing process utilizing both Displacement and Diffusion principles. Even though the mathematics of the very complicated dynamic characteristics of this process have been solved, any attempts to control this kind of washing system have generally not been very successful due to the lack of reliable measuring instruments and analyzers, which are necessary to provide the critical information needed for the optimization and control of this difficult process.

Of the total Pulp Mill Sodium Losses, typically 94% of the Free Sodium (as NaOH, Na<sub>2</sub>CO<sub>3</sub>, Na<sub>2</sub>S and Na<sub>2</sub>SO<sub>4</sub>), as well as some combined with the organic matter are lost as carry-over or "Washing Loss" at B.S. Washing Plant; therefore the first consideration is the cost of make-up chemicals to replace this loss. The second consideration is to maximize the "Solids Yield" due to its heat value at the Recovery Boiler and to minimize the "Dilution Factor" in order to save steam at the evaporators. The third consideration is to monitor the shower solids at the remaining stages in order to quickly detect possible washing problems. Additional factors are, whether being evaporator limited as is the case in many mills, or being a bleachable grade mill, in which case no bleaching action can take place until the excess sodium in the pulp has been neutralized.



**THE UNIQUE DESIGN** of this analyzer has proven itself in several other difficult Kraft Pulping and Recovery applications to be practically maintenance free, physically small and portable with easy installation and low installed cost. Specific attention to design details have eliminated problems associated with collecting samples..

## APPLICATION TECHNOLOGY

The hardware package being offered combines both the Duralyzer-NIR analyzer as well as the specifically designed, reliable and low-maintenance rotary consistency analyzers (if not yet existing) for HD Pulp Line as well as Digester Blow Line (Kamyr), alternately Blow Tank Outlet in case of Batch digesters (must have dilution flow measurement available as well). Included also are retractable gate valve assemblies for the consistency meters and sampling systems for the Duralyzer-NIR. A Consulting Service for the mandatory process study and the mathematics that are needed to be programmed to the customer's existing DCS System (or an auxiliary computer), are also included. All the critical B.S. Washing Plant Indicators, like Weight Ratio (W), Relative Yield (Y), Relative Washing Loss (1-Y), Washing Liquor Ratio (R), Dilution Factor (DF) and the entire plant Efficiency Factor (E) are being internally calculated. Thus all the critical factors in order to optimize any counter-current washing plant are continuously displayed, recorded and are at the customer's disposal for optimum operation. The last washer Fresh Water Flow is then controlled based on the above information. In a well instrumented Washing Plant, the upstream shower flows are then automatically controlled in order to maintain steady Seal Tank levels, as well as Washer Vat levels, which in turn controls the drum speed. To monitor the performance of each washer, the shower TDS of the remaining stages is also measured in order to detect and alarm in case of plugged or partially plugged filtration, excess soap formation or any other disturbance of the process. For the Kraft Process, certain guide lines have already been established between Weight Ratio (W) and Yield (Y) in order to arrive at the optimal operating point; therefore the System will be able to suggest to the operator what changes are needed for the best efficiency that is available from each individual Washing Plant.



**THE SYSTEM** will calculate and display the following, allowing 5 minutes per sample

1. Total Sodium Loss out of the last Washer as lb Na<sub>2</sub>SO<sub>4</sub>/gal and per BDT of pulp.
2. Dilution Factor (DF), which represents the amount of excess wash water (water in last shower minus water leaving with pulp, t/BDT).
3. Solids Yield to the Evaporators (%).
4. Washer Shower TDS (%).
5. Plant overall efficiency in the scale of 1 to 4+ (1 being the poorest, 2.5 being an average), which will directly tell, how well the Washing Plant has been balanced and tuned up.

### UTILITY REQUIREMENTS:

- **Electrical:** 110-120 VAC/60 Hz, 10 Amp
- **Air:** Instrument air 70-120 psi
- **Sample Lines:** 1/2" SS tubing
- **Drain:** 1" pipe back to process
- **Water:** Mill water 40-80 psi, 3/4" tubing
- **I/O:** 4-20mA for each component  
Optional MODBUS/TCP

### MAINTENANCE REQUIREMENTS:

- **Maintenance Kit:** Available
- **Light Source:** Annual Bulb Replacement
- **Lens cleaning Acid:** Every 6 mos

**Manufacturer:** [www.rehodes.com](http://www.rehodes.com)  
R.E. Hodges, LLC Auburn, Alabama

