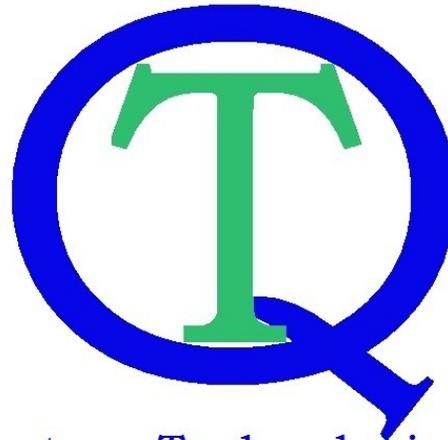


Liquor Oxidation Process

A nominal 50-70 gallon per minute White/Green Liquor oxidizer process mounted on a 28' x 9' skid, fully automated and available for our purchase or plant trial. The unit requires electricity, oxygen, liquor feed, take-away piping and depending upon the application, cooling or heating water. The oxidizer is available for rent, purchase or our Rent-to-Buy program.



Quantum's Oxidizer can save on pulp production costs.



Quantum Technologies Inc White/Green Liquor Oxidation Process

Quantum Technologies Inc.

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*Innovators in the Pulp
and Paper Industry*

White/Green Liquor Oxidation Process



Quantum Technologies' Liquor Oxidizer reactor is available in 28", 36", 48" diameter and can be engineered and designed to the customer's specifications.

Quantum Technologies Inc.

Tel: 330-645-2762

Quantum Green & White Liquor Oxidizer



Since 1981 Quantum Technologies Inc. has developed specialized

White & Green Liquor Oxidizer Unit equipment for the continuous mixing of gases, liquids, and solids. Our patented Continuous Flow series reactors will continuously mix/react large volumes of gases with liquids or slurries, and are a cost-effective replacement for stirred and diffusion tanks and packed towers.

The Process

The Quantum Oxidation process takes liquor directly from the clarifier into a break-seal tank, pumps it into the reactor where it is mixed with pressurized oxygen, then to a gas/liquid separator where the oxidized liquor is piped to the process and the gas (a small amount of unreacted oxygen and dissolved gases purged from the liquor) is vented back to the receiving tank.

Uses for the Oxidizer in the Pulp Mill

The Liquor Oxidation process can be used in the following applications at the mills: 1) Substitute caustic with oxidized white/green liquor in bleach plant. 2) Allows for substitution of sulfite in semichem mills. 3) Allows for substitution of caustic in thermo-mechanical mill. 4) Caustic source for O₂ Delignification by substituting caustic with oxidized white/green liquor for balance of sodium in the mill. 5) Improves performance of the recovery boiler through purging of chlorides in the mill.

Specifications

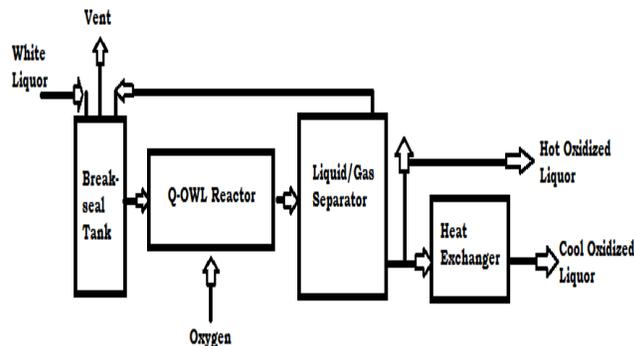
Quantum's Oxidation process is designed to be adaptable to the existing mills controls making it possible for manual and full automation. The entire process comes on a 16'x14'x10' skid that is designed to be mounted on a foundation. Final installation requires electricity, oxygen, feed and takeaway piping to the battery limits, and process control installation.

Typical Analysis

Oxidized white liquor used in the following laboratory work was produced in Quantum's Oxidizer pilot plant using mill white liquor direct from the clarifier.

	Concentrations (g/L as Na ₂ O)				
	NaOH	Na ₂ S	Na ₂ S ₂ O ₃	Na ₂ SO ₃	Na ₂ SO ₄
WL	58.9	30.8	1.61	1.50	3.54
Q-OWL	62.0	0	2.81	1.70	30.5

Note: The Oxidizer increase in NaOH is a result of the oxidation reaction.



Quantum's Liquor Oxidizer Process Flow Sheet
Liquor feed from mill to break seal tank to Q-OWL Reactor to liquid/gas separator to heat exchanger (if applicable) back to mill as fully oxidized liquor.

Liquor Oxidizer in O₂ Delignification

Starting Pulp: Kraft Hardwood

Br = 28.2 Vis = 31.4 Kappa = 29.1

Conditions: 2.5% NaOH equivalent

100°C; 110 psig O₂; 0.1% MgSO₄; 30 min; 12% Cst

Caustic Source	NaOH	Quantum Oxidizer
pH	11.8	11.5
GE Br.	41.5	43.4
Viscosity	16.1	14.7
Kappa	12.1	11.1

Liquor Oxidizer In The Bleaching Stage

Pulp Type	Kraft SW	
Sequence	ODE _{OP} DED	
Alkali	NaOH	Quantum Oxidizer
GE Br.	89.0	89.1
Viscosity	16.9	18.1

Liquor Oxidizer in SO₂ Scrubbing

Scrubbing	Outgoing Flue Gas	
Liquid	SO ₂ (mg/m ³)	H ₂ S(mg/m ³)
NaOH	100-300	0 to 6
W.L.	100-300	30-100

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