

Electronic Process Control Room Air Purification for a Single Line Bleached Kraft Pulp Mill



Built in 1994/1995 in Kerinci, North Sumatra, Indonesia, Riau Andalan Pulp & Paper is one of the most technically advanced bleached pulp mill facilities worldwide.

The facility stands on approximately three square kilometers producing a bleached pulp product for worldwide distribution.

The owners of Riau Andalan Pulp & Paper, April Group, designed the plant with the latest in computer process control and automation.

The entire plant is controlled with one main control room and satellite control rooms in remote areas. Each process throughout the plant incorporates its own control center, motor control rooms and computer rack rooms. All areas were considered for environmental control.

Design Parameters

The room's design was evaluated for both civil and mechanical considerations. Civil consideration was to build the rooms with the highest level of leakage integrity as possible. Walls have been built with block construction

Riau Andalan Pulp & Paper Mill

finished with a half inch thick plaster covering on the inside and out. The plaster is further painted with a vapor barrier type paint to ensure a minimum permeability.

All personnel access locations were designed with air lock doors to reduce the amount of contaminant ingress during entry and exit of the protected space. Cable and pipe penetrations into the protected space were consolidated to one location of the room. This would reduce the leakage potential and effectively ensure that room sealing integrity would be maintained.

The doors of the control room are manufactured of insulated double wall steel with a knife edge design along the peripheral edge. This unique design allows the door to provide a positive seal once it is closed. Heavy-duty positive pressure closing devices were also used on each door assembly.

The mechanical design consisted of both pressurization and recirculation systems. The pressurization system design not only took into consideration the effect of the contaminant gas

Circul-Aire's Deep Bed Scrubber, Model DAS1010



hydrogen sulfide (H₂S) but also considered gas vapor pressure diffusion and the effect of wind pressure against the protected space. The air flow was designed for 8% of gross room volume to maintain 0.1" w.g. positive pressure. The recirculation system was designed for 20% of gross room volume. The positive pressure design of 0.1" w.g. pressure differential provides the protected space with an out flowing velocity of approximately 500 FPM (2.52 m/s) from the room.

The recirculation systems were used only for control rooms and rack rooms. These systems control the contaminants that infiltrate through door openings and undetermined leakage points, as well as remove contaminants that have desorbed from personnel entering the space.

Gas Phase Filtration: The Solution to Corrosive Gas Mitigation

Gas Phase Filtration is the technology used to purify the air from all organics, inorganics and acid gases that are generated from the bleached pulp process.

The principal systems used were the Circul-Aire DAS units for pressurization and A.P.S. units for recirculation. The DAS horizontal deep bed air scrubbers are self-contained units incorporating all particulate filters, chemical filters and supply fans. The chemical media used was MM-9000, coal based activated carbon impregnated with potassium hydroxide.

The Circul-Aire A.P.S. units are vertical computer grade systems installed inside the protected space with free return and supply air, designed for optimum room air changes per hour.

The total number of rooms considered were 31 electrical rooms, 15 computer rack rooms, and 5 control rooms.

The scheduled periodic inspections proved that the original 12-month design period was surpassed by 3 months without the requirement of new media. The monitoring program ensured G1 level was maintained at all times as per the Instrument Society of America Standard 71.04.

Tech-Chek Service for Maintenance Monitoring

The maintenance of the DAS/A.P.S. systems has also been simplified with the Tech-Chek Service supplied by Circul-Aire. With this exclusive service, media samples are tested in order to verify consumption rates. This lifetime service is monitored by a computerized program from Circul-Aire that indicates the appropriate schedule for media replacement. The laboratory analysis, supplied at no additional charge, not only provides a precise maintenance schedule but also ensures the highest performance of the air purification system installed at the Riau Andalan Pulp & Paper Mill.



Main Control Room

FOR MORE INFORMATION ON A SPECIFIC APPLICATION, PLEASE CONTACT YOUR LOCAL REPRESENTATIVE OR CIRCUL-AIRE.

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