Koch Dual Tunnel 4 Stage Washer

1.1. Spray Pretreatment System; 4-Stage Dual Line

1.1.1. Dimensions: 118''-6" long x two (2) tunnels, each 5'-10" wide (11'-8" O.A.) x 8'-4" high elevated housing; 3'-3"high tanks

1.1.2. All tanks have sloped bottoms and are provided with overflow, drain, hinged lids with extended handles on the pump well, level controls, 2" quick fill and make-up piping;

1.1.3. The floor mounted tanks will be covered with stainless steel removable lids to allow for complete access to the interior for cleaning.

1.1.4. Spray housing constructed of welded steel sheet; fixed drainboards, silhouettes and conveyor guard provided; See Data Table "A" for materials of construction

1.1.5. Elevated housing design with tanks located on factory floor; housing elevated to allow for complete access to the tanks and allow walking access under the housing.

1.1.6. Lighting will be provided under the elevated housing (fluorescent, T5)

1.1.7. Spray housing to be preassembled in sections if possible

1.1.8. Three (3) stainless steel access doors each with duplex receptacle; access platform with stairs

1.1.9. Ceiling mounted laminated glass panel complete with externally mounted fluorescent light provided, ten (10) provided (T5)

1.1.10. Drainboards will be sloped and adequately reinforced with structural members to minimize buckling and subsequent areas of standing water

1.1.11. At each stage will be one (1) stainless steel return flume provided to return the solution from the elevated housing to the floor level tanks below. Flume termination point will extend below the liquid level. Flume opening in drain board to be protected by removable non-skid fiberglass grating for safety.

1.1.12. Conveyor guard will be furnished the full length of each spray stage, extending 1'-0" into the drain areas to aid in protecting the conveyor chain and trolleys from direct spray impingement. Materials will be consistent with the housing.

1.1.13. Vertical top pull out pumps (Gusher- Does not recommend the use of Lubesite 560 lubricators on pumps)

1.1.14. Stainless steel double disc check valve and butterfly valve will be provided at each pump discharge.

1.1.15. All pumps protected by double removable screens

1.1.16. Stages #1 & #2 will be provided with a removable sludge dam for each screen assembly. Dams are provided with extended handles and placed in a separate track than the screen.

1.1.17. Redundant pumps. All redundant pumps will alternate and auto shift/start through the PLC

1.1.18. Each stream spray zone will be provided with a dedicated pump. A third, redundant pump will be provided. Piped into a header. Header will have actuated butterfly valves to feed each stream. PLC will control all pumps and actuated valves.

1.1.19. Discharge piping will be provided with check valves to prevent backflow through the non operating pump

1.1.20. Logic will be provided within the PLC to alternate pump operation.

1.1.21. Pressure transducers will be provided in the lines after the header feeding each stream to monitor for reduced pressure and automatically switch pumps.

1.1.22. Heated stages will be provided with a dedicated pump with redundant pump.

1.1.23. Heat exchanger piping will be provided with pressure transducers to monitor for reduced pressure

1.1.24. One (1) hoist rail complete with support steel, trolley and manual chain hoist (1 ton) will be provided for removal of the pumps. Rails will run the entire length of the machine.

1.1.25. Plate and frame heat exchangers with type 304 stainless steel plates and appropriate gaskets; units designed for full flow from dedicated vertical pump at each heated stage for heat exchanger unit

1.1.26. Stage #1 and #2 heated, heat exchangers and pumps sized for common pump size with spray stage pumps, spray pumps will have VFD's for control of spray pressure.

1.1.27. Same plate size for each unit for easier maintainability

1.1.28. 304 stainless steel bag filter provided prior to heat exchangers, sized for full flow, bypass and alarms through the PLC

1.1.29. Temperature control via P.I.D. loop within the PLC, operating three-way water mix valves at heat exchangers. Temperature monitoring in PLC system.

1.1.30. Pressure gauges for pressure drop across filter and across heat exchanger will be provided.

1.1.31. Top fed riser configuration; piping materials subject to approval by customer's chemical supplier; see Attachment "A" for stage piping materials of construction

1.1.32. Manual adjustment of spray pressure through VFD on all stages

1.1.33. Spray risers equipped with quick disconnects at headers and threaded caps at riser ends; riser spacing of 18"

1.1.34. Nozzles are “zip tip” polypropylene snap-on adjustable ball assemblies

1.1.35. Counterflow system for water conservation where applicable; Stage # 4 to # 3 (on stage 3 conductivity), # 3 to # 2 and #1 (on demand).

1.1.36. Stage # 1 will be equipped with a Smartskim #CF-VIT Crossflow oil separator with Crossflow platepack and floating skimmer. Fed with a dedicated air diaphragm pump

1.1.37. Entrance and exit exhaust fans, four (4) provided; 3,870 CFM with 1 HP motor; axial type with stainless steel airstream components; exit drip shield; aluminized spiral exhaust stack, fans are equipped with Lubesite 560 lubricators

1.1.38. Safety shower/eyewash station; two (2) provided

1.2. Powered Exit Blow-Off System; per Stream

1.2.1. Blow-off system provided for each stream with a 2'-0" drain section between pretreatment exit and blow-off entry; 10'-0" long blow-off section

1.2.2. Side housing walls and drain pan; similar construction to pretreatment housing all welded construction; open top design

1.2.3. External support steel structure for housing and conveyor loading

1.2.4. Twelve (12) air cannons per stream; distribution plenum with interconnecting ducting

1.2.5. One (1) high pressure fan unit, per stream; 25 HP each, VFD controlled; direct drive; manufactured by Air Force 1 Systems. Fan units located in sound control enclosure; enclosure has filtered air intake and discharge mufflers; fans are equipped with Lubesite 560 lubricators

1.2.6. Stainless steel drip pans will be provided from the pretreat exit to dry-off oven entry

1.2.7. Data Table "A" follows:

Streams 1 & 2

SURFACE PREPARATION MACHINE DESIGN DATA

Stg Nr	Solution	Time Sec	Temp °F	# Riser	# Noz	Type of Nozzles	Noz Pres psig	Gpm Noz	Pump Cap Gpm	Tdh (Feet)	Hp	Approx Tank Cap Gals	Operating Btu/hr Input
1	PreClean	30	140	9	108	KQV 5050	20	3.5	378	71	15	3,364	2,125,400
2	Clean	60	140	18	216	KQV 5050	20	3.5	756	69	30	5,273	1,024,000
3	Rinse	30	Amb.	9	108	KQV 5050	15	3.1	335	58	10	2,011	n/a
4	Rinse	30	Amb.	9	108	KQV 5050	15	3.1	335	58	10	2,011	n/a

SURFACE PREPARATION MACHINE CONSTRUCTION MATERIALS

Stg Nr	Solution	Pump Material	Tank Material	Housing Material	Drainboard Material	Riser Piping Material	External Piping Material	
1	PreClean	SS Wetted	3/16" 304SS	14 Ga 304SS	12 Ga 304SS	CPVC	304SS	
2	Clean	SS Wetted	3/16" 304SS	14 Ga 304SS	12 Ga 304SS	CPVC	304SS	
3	Rinse	SS Wetted	3/16" 304SS	14 Ga 304SS	12 Ga 304SS	CPVC	304SS	
4	Rinse	SS Wetted	3/16" 304SS	14 Ga 304SS	12 Ga 304SS	CPVC	304SS	