



STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Regeneration of Mixed Bed Unit

SOP No.		Revision No.	
Effective Date		Supersedes No.	
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1.0 OBJECTIVE:

The purpose of this SOP is:

- 1.1 To describe the procedure for regeneration of Mixed Bed Unit.

2.0 SCOPE:

- 2.1 This SOP is applicable for the procedure for regeneration of Mixed Bed Unit at

3.0 RESPONSIBILITY:

- 3.1 The Maintenance Operator shall be responsible:

- 3.1.1 Responsible for regeneration of Mixed Bed Unit.
- 3.1.2 Responsible for maintaining the regeneration record.

- 3.2 The Maintenance Engineer shall be responsible:

- 3.2.1 Responsible for ensure the proper sanitization.
- 3.2.2 Responsible to take corrective action if any deviation observed.

4.0 ACCOUNTABILITY:

Head –Engineering Services

5.0 PROCEDURE:

5.1 PRIMARY CHECKS:

- 5.1.1 Before starting regeneration of the beds, ensure that mixed bed outlet diaphragm valve V15 is closed.

5.2 MIXED BED REGENERATION:

- 5.2.1 Caustic soda solution preparation.

- 5.2.1.1 Fill the caustic dilution tank with 100 liters of deminerlized water and gradually



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add 12 kg of caustic soda (NaOH-100%), stir the solution till it is completely dissolved.

5.2.2 Acid solution preparation for phase I:

5.2.2.1 Fill 60 liters of demineralized water into the acid measuring tank and then pour 40 liters HCL (30-33%), stir while pouring.

5.2.3 Back wash:-

5.2.3.1 Open wash inlet valve XV6, XV7 & XV8 and wash outlet about 10 min.

5.2.4 Caustic injection:-

5.2.4.1 Open the caustic rinse outlet valve V9, caustic ejector power water valve XV9, XV10 & XV11 & solenoid valve open caustic ejector suction valve and adjust caustic ejector power water valve V9 to maintain the specified time (for about 18min) after completion of caustic solution close valve.

5.2.5 Caustic rinse:-

5.2.5.1 Open inlet valve V9, XV11 and adjust caustic rinse outlet Solenoid Valve for SV02 about 45 min. After the Specified time of rinsing, close valves XV10.

5.2.6 Acid injection:-

5.2.6.1 Open acid rinse outlet valve XV12, XV13 XV14 & Solenoid valve SV01. acid ejector power Water valve acid ejector suction valve. Adjust acid ejector power water valve to maintain specified time (for about 15min.). After completion of acid solution close ejector suction valve and acid ejector power water valve.

5.2.7 Acid rinse:-

5.2.7.1 Open flushing inlet valve XV12, XV14 and acid rinse outlet valve. Adjust valve for 15 min. acid rinse. After the specified time of rinsing, close flushing inlet valve XV13.

5.2.8 Drain down:-

5.2.8.1 Open wash outlet valve XV4, XV8, XV14 air release valve and air drain valve.



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After 10 minutes, close valve (It is most important that the air drain valve is closed before Continuing the regeneration.)

5.2.9 Air mixing:

5.2.9.1 Open the air delivery valve XV8, XV15 and air drain valve. Open compressed air supply valve and gradually adjust air delivery valve for specified air pressure (1Kg/cm²) and simultaneously close air drain valve.

5.2.10 Refill and final rinse:

5.2.10.1 After the 10 minutes of air mixing, quickly close the air inlet valve and open the air drain valve. Then open acid rinse valve XV4 & XV14 and close wash outlet valve. Open inlet valve, close air release valve. Regulate acid rinse outlet valve to maintain the flow for about 10 minutes. After the specified rinsing time open-air release valve V2 to remove the trapped air and then close it. Switch ON the conductivity indicator check the conductivity (less than 1.25 micro Siemens /cm) and pH (5 –7) if found satisfactory close acid rinse outlet valve and open outlet valve for service. Control the service flow by regulating the valve. If conductivity and pH are not within the specified limit; continue the final rinse till obtain the specified parameters.

5.3 FREQUENCY OF REGENERATION:

5.3.1 Regeneration of the Mixed Bed is to be carried out in every 20 hours.

6.0 ANNEXURES:

Annexure –I: Regeneration record of Mixed Bed Unit.

7.0 REFERENCES:

SOP

8.0 GLOSSARY

SOP : Standard Operating procedure



PHARMA DEVILS

ENGINEERING DEPARTMENT

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No : Number

HCL : Hydrochloride acid.

% : Percentage.



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ANNEXURE-I

DATE	REGENERATION TIME (Hrs.)		CONDUCTIVITY (μ s / cm)	pH	REGENERATION DONE BY	REMARKS	ENGINEERING SIGNATURE
	From	To	Mixed Bed	Mixed Bed			

ACCEPTANCE CRITERIA

pH	Conductivity
Mixed Bed	Mixed Bed
5.0 – 7.0	NMT 1.25 μs/cm