



MANUFACTURER OF FORMULATED CHEMICALS FOR INDUSTRY

SURFACE CLEANING
TECHNOLOGIES

Technical Data Sheet

PRODUCT NAME: EZ KLEEN™ DESCALER NF

DESCRIPTION

EZ KLEEN™ DESCALER NF is an inhibited hydrochloric acid descaler. It dissolves phosphate, sludge, lime-scale, calcium and magnesium carbonates, and corrosion products such as rust but has minimal effect on the base materials of fabrication. **EZ KLEEN™ DESCALER NF** dissolves lime-scale fairly rapidly causing it to fizz as carbon dioxide is given off. The scale tends to disintegrate into smaller particles before finally dissolving, allowing it to be flushed away. There are nearly always some particles which refuse to dissolve but which can be flushed away.

EZ KLEEN™ DESCALER NF is specifically formulated for the cleaning and/or removing of heavy scale build up in inaccessible areas of the phosphate system especially when a limited amount of time and manpower are available for the clean out. **EZ KLEEN™ DESCALER NF** was developed with proprietary inhibitors to provide excellent corrosion protection on mild steel and stainless steel.

CONTROL PROCEDURE

For kettles and boilers: Fill the kettle or boiler with cold water and add **EZ KLEEN™ DESCALER NF**. Leave for 30 minutes to an hour depending on the amount of scale, then flush out well with clean water. If heating is available, increase to up to 135°F.

Always follow de-scaling with a multiple water rinses.

TECHNIQUE	DILUTION RATE
Industrial Parts Washers	5-20%
For industrial kettles and boilers	1-10%
For larger boilers it is more cost effective to use heavier dilution and allow a longer time for it to work	10-20%

Do not leave the concentrated product in contact with stainless steel for long periods as pitting could eventually occur. Caution should be exercised in using **EZ KLEEN™ DESCALER NF** on aluminum, brass and zinc as extended exposure may result in attack, depending on the use concentration, for these metals. Heavy duty descaling of industrial equipment only. Do not use for warewash equipment or other lighter duty equipment. Consider Descale and Descale NP for lighter applications. Welded seams are recommended, as caulking will need to be replaced after descaling.

EZ KLEEN™ DESCALER NF can be neutralized in place with Caustic Soda Liquid, which is available from Chemfil. As a general rule of thumb, it requires 2.3% of 50% Caustic Soda Liquid to neutralize a 5% solution of **EZ KLEEN™ DESCALER NF**.

At low temperatures **EZ KLEEN™ DESCALER NF** has a tendency to foam. Your Chemfil Representative will provide a recommendation regarding foam depressor to use if needed.

WASHER DESCALING APPLICATION

1. If the phosphate spray risers are thoroughly plugged with scale, all riser end caps must be removed and circulating pumps turned on for 10 minutes to flush out all sludge blockages in the risers.
2. If overhead risers are completely plugged, then the risers must be rodded out or replaced.
3. Transfer the phosphate solution to a storage tank. If a storage tank located outside of the system is not available, then transfer the solution to stage #2 in a 6 or 8 stage phosphate system. It is important that stage #2 be cleaned and rinsed with water prior to transferring the phosphate solution.
4. Turn alternate riser nozzle so as to direct every other nozzle sprays against the tunnel walls. If this is not possible, clean in the normal riser position.
5. Fill the stage tanks on both sides of the phosphate stage with water and add one gallon of 50% Liquid caustic soda (NaOH) for each one thousand gallons of water in the tank. This will neutralize any acid fumes escaping from the phosphate stage during the acid cleaning.
6. Heat exchangers should be isolated, so that the **EZ KLEEN™ DESCALER NF** does not circulate through them during the cleaning.
7. Add water to the phosphate stage and start the circulating pump. Check to insure that all nozzles are open.
8. Close all doors and tank lids. Start exhaust fans at each end of the system.
9. Add 10%-20% by volume of **EZ KLEEN™ DESCALER NF** to the unheated water in the phosphate tank. Your Chemfil Representative will recommend what acid concentration should be used based on scale build-up and time considerations.
10. Start the circulating pumps. After the solution is thoroughly mixed, heat the tank to a maximum of 135°F. Circulate the solution for 2 1/2 hours.

11. Periodically, a quick visual inspection of the interior of the system should be made during the cleaning cycle by opening the doors on both sides of the phosphate stage. This is to visually insure that all acid solution is kept inside the stage and not spraying out due to a blown nozzle.
12. After the initial 2 1/2 hours of cleaning have been performed, shut down the circulating pumps and allow system ventilate for approximately 15 minutes. Conduct visual inspection of risers and nozzles for possible realignment then continue to circulate the cleaning solution for a minimum of one hour and a maximum of four hours total cleaning time.

NOTE: The cleaning time required will depend on the acid concentration used and the amount of scale build-up that needs to be removed.

13. At the conclusion of the acid cleaning operation, remove all end caps on the overhead risers and inspect inside risers for scale build-up. If scale is found, turn on circulating pumps and operate for 15-30 minutes to flush out all risers of accumulated sludge and remaining scale build-up.
14. After acid cleaning has been completed, notify waste treatment prior to discarding all used acid solutions.*

IMPORTANT: Dry caustic flake is not recommended since it would react violently with the cleaning solution or water.

NOTE: * NEUTRALIZATION PROCESS FOR EZ KLEEN™ DESCALER NF

In some plants, the acid solution must be neutralized in the stage tank prior to discharging to waste treatment. In order to determine the acid content remaining, a titration of the acid solution should be performed in accordance with the procedure below. This neutralization procedure results in a pH of 8.2.

IMPORTANT: Dry caustic flake is not recommended since it would react violently with the cleaning solution or water.

Total Acidity of EZ KLEEN™ DESCALER NF	Concentration of EZ KLEEN™ DESCALER NF bath	Amount of 50% Liquid Caustic required to treat 1000 gals of solution
4.3mls	5%	302lbs (23 gallons)
8.6mls	10%	604lbs (46 gallons)
12.8mls	15%	906lbs (69 gallons)
17.1mls	20%	1210lbs (93 gallons)
21.4mls	25%	1500lbs (116 gallons)

TITRATION PROCEDURE

Transfer a 10ml sample of the **EZ KLEEN™ DESCALER NF** operating bath into a 150ml beaker. Add 4-5 drops of Indicator #5 (Phenolphthalein) and titrate with Test Solution #1 (1N NaOH) until the solution changes from colourless to pink. The mls of Test Solution #1 is recorded as Total Acid.

IMPORTANT: It is crucial that the stages cleaned with **EZ KLEEN™ DESCALER NF** are neutralized with caustic after the initial acid cleaning procedure is completed. Also a minimum of 2 complete water flushes of these stages is required to insure that all cleaning contaminants are removed from the system. Systems with contaminants left in the system due to poor neutralizing and/or water rinsing can cause a severe reduction in the corrosion resistance properties of the phosphate coating. Also the phosphate coating uniformity can become irregular due to these leftover contaminants.

15. Drain tank, manually hose down interior tunnel sections such as walls, ceiling, risers, headers, etc. Remove sludge particles from the tank bottom.
16. Fill tank with fresh water and add 16 gallons of liquid caustic per 1000 gallons of water. Circulate solution for thirty (30) minutes to neutralize any acid remaining in the system.
17. Drain, flush and fill tank with fresh water and circulate solution. Adjust nozzles for the proper spray position.
18. While tank is draining, manually hose down all interior sections of the stage.
19. Water flush all tank walls and remove all residual sludge from the clean-out.
20. Drain, flush and clean out the stage tanks before and after the phosphate stage.

IMPORTANT: All tanks and heating equipment, i.e. plate and frame, tube and shell, coil, etc. should be checked for steam leaks immediately after cleaning the system and before production is attempted. Scale could have been acting as a sealant on excessively worn heating systems and upon their removal leaks could develop. Check with the heating equipment manufacturer for their recommendations on the compatibility of **EZ KLEEN™ DESCALER NF** with their equipment.

21. Return the stored phosphate solution to tank. If solution was discarded, refill the tank with water and make up new operating solution.
22. Adjust phosphate concentrations to recommended operating parameters. System is ready to heat for production.

NOTE: Capable of meeting the requirements in Military specification TT-C-490E