



NLR 404 – ACIDIC LIQUID MEMBRANE CLEANER

FOULING

The loss of membrane performance due to fouling by metallic based chemicals and scaling components is common to many UF, NF and RO membranes worldwide. This fouling can lead to reduced permeate flow, changes in rejection characteristics across the membrane system, increases in differential pressure and frequent membrane replacement.

CLEANING

Keeping your membrane clean with regular cleaning routines or performing a maintenance clean to recover the membranes are possible solutions to overcome the fouling plaguing many existing systems.

The NLR-404 liquid membrane cleaner is designed to target various foulants including: metallic salts, metal hydroxides, minerals, dyes and inks. This cleaner will effectively clean your system in order to maintain the membrane performance and extend the life of your membranes.

USAGE INSTRUCTIONS

Cleaning for your particular system may require an individualized procedure based on your type of foulants. However, the following is a basic procedure that should work for a broad range of situations.

NLR-404 is a concentrated, acidic cleaner that should be diluted with water to the proper concentration prior to use. The

cleaning solution should be prepared in a clean tank equipped with a mixer and a low-pressure recirculation pump. For a standard cleaning you will prepare a 2% solution. This will equate to adding 2 gallons of the NLR-404 cleaner to 98 gallons of water. Here is a table outlining the volumes to use for various final cleaning solution volumes.

Total Cleaning Solution	Volume of NLR 404	Volume of Water
5 gallons	12.8 ounces	4.85 gallons
10 gallons	25.6 ounces	9.7 gallons
30 gallons	0.6 gallons	29.1 gallons
50 gallons	1.0 gallon	48.5 gallons
55 gallons	1.1 gallons	53.35 gallons
100 gallons	2 gallon	97 gallons
200 gallons	4 gallons	194 gallons
300 gallons	6 gallons	291 gallons

The solution pH will be approximately 2.5 to 3.0 at a 2% concentration. When recirculating the solution through your membrane system you will want to use a feed pressure of 30-50 psi. The exact flow rate will depend on the size of your membrane module.

Rinse your membrane system first with de-ionized (DI) water for 10 minutes. Prepare the NLR-404 cleaning solution as instructed above and heat to 45°C or prepare the solution with heated water. Recirculate the solution for 30-45 minutes checking the pH periodically and adjusting as necessary. Use NaOH to increase the pH or Sulfuric Acid to decrease the pH. The cleaner will work best at between pH 2.0 to 3.0. Always confirm that the cleaner, the pH used, and the temperature of your solution are compatible with your membrane system. Rinse the system again with DI water prior to returning

to your regular process feed material. The use of DI water is not necessarily required but ordinary tap water may introduce foulants to your system prior to returning to your feed material. If you are having problems with your cleaning then you should test to see if a DI water rinse following cleaning improves the performance.

For periodic maintenance cleaning or for heavily fouled membranes you may want to prepare a 3% solution of the NLR-404 cleaner and recirculate as above or complete the above cleaning two times. You may also want to have your membranes soak overnight for heavily fouled systems.

REQUIRED CLEANING TIME

The actual time required to complete a cleaning will depend on the foulants and the length of time between cleanings. In some cases you can clean in 30 minutes while in other cases it will take hours or could require an overnight soak. The best cleaning cycle will be determined through experimentation by altering variables such as: cleaner concentration, water temperature, type of water, and duration of cleaning cycle.

The longer you run the cleaning solution, the more likely you are to consume one of the ingredients. For longer cleaning you may need to add more NLR-404 to the cleaning tank. This is another parameter to consider when optimizing your process. Measuring pH periodically will help you determine if the cleaner composition is maintained.

PACKAGING

NLR-404 is shipped as a liquid in 5-gallon plastic containers or 55-gallon drums. The shelf life for the cleaner when stored unopened indoors at a temperature between 5°C and 30°C is one year from its date of manufacture. For specific pricing and delivery information, please contact New Logic.

HANDLING

NLR-404 is an acidic cleaner and should not be mixed with other cleaners unless specified by the vendor. Mixing NLR-404 with alkaline components may cause precipitation.

Wear chemical resistant gloves when you expect long, constant exposure. It is also a good practice to wear safety glasses or goggles when using this product.