

## MACJAMES® MDSC-12 - DESCALER/SCALE CLEANER PRODUCT TECHNICAL DATA SHEET

### INNOVATIVE FEATURES

- Easy to use.
- Economical.
- Contains corrosion inhibitors.
- Faster in descaling.
- Can be easily disposed in sewers and flushed with water on proper dilution.
- Safe to use; can be held on open hand without injury. (In case of splashes during handling or use, - But use hand gloves in handling chemicals)

### 1.0 INTRODUCTION AND PRODUCT DESCRIPTION

**Scale** is the most prevalent of all water quality and other fluid process equipment problems. Scale is primarily composed of Calcium and Magnesium Carbonates, but may also form as Calcium Sulphate, Silica complexes and Ferric Oxide. These materials enter the system in a dissolved state and due to certain chemical and physical reactions, they become insoluble and fall out of solution and deposit on the surfaces of associated equipment. Scale in a system can coat the inside of the tubing, restricting water flow and acting as an insulator, reducing the transfer of heat as well as increasing fluid demand from systems.

**MACJAMES® MDSC-12 - DESCALER/SCALE CLEANER - (APPROVED BY DEPARTMENT OF PETROLEUM RESOURCES (DPR): DPR/LAB/7302.5/Vol.4/24)** is an innovative biodegradable descaler formulated and produced to dissolve and remove the toughest water scale, limescale, mud, rust, and other mineral deposits on metal surfaces from virtually any piece of fluid operated equipment. This innovative descaler is safe for personnel, equipment and our environment. **MACJAMES® MDSC-12** is non-corrosive and does not corrode, pit, oxidize or have other damaging effects on materials as; iron, copper, fiber, rubber, steel, plastic, brass, ceramic, glass, titanium, nickel, stainless, and other materials associated with fluid-based equipment if used as directed. Most cleaning activities can be completed in few hours.

**MACJAMES® MDSC-12** is used in descaling/cleaning pipes, Reverse Osmosis and Ultra-filtration systems, water-cooled condensers, chillers, boilers, heat exchangers, condensers, pumps, cooling towers, boilers, tubes or equipment with scale or rust deposits. Formulated with wetting and penetrating agents to dissolve deposits into solution, **MACJAMES® MDSC-12** is fast in action and cost-effective. It can be safely handled by personnel and circulated through your equipment or system without dismantling, and in some cases your equipment or system may continue to operate during cleaning. Being biodegradable, it can be easily and safely disposed in normal plant sewers in well diluted state as local regulations permit. This innovative descaler is used when economy, efficiency and ease of use are of maximum importance.

**PACKAGING SIZES:** 4 x 4 Litres : 20 Litres : 25 Litres : 200 Litres : IBC Tank (1000 Litres).  
Others on request.

## 2.0 APPLICATION INFORMATION:

### 2.1 DILUTION RATIOS

The ratios in the table below are approximations only. Actual requirements may vary due to scale composition and thickness. Therefore, the approximations should be a guide and subject to operational conditions and contact time.

Scale Types	Thickness of Scale	Dilution Required MDSC-12 : H <sub>2</sub> O
Very Heavy Scale	1/4" and over	Full strength
Heavy Scale	1/8" to 1/4"	1:5 to 1:10
Medium scale	1/16" to 1/8"	1:10 to 1:30
Light Scale	Less than 1/16"	1:30 to 1:60

### 2.2 INSTRUCTIONS FOR USE IN PIPELINES AND PROCESS EQUIPMENT

1. Turn off the valve or circulating pump.
2. Drain and flush all sludge and dirt.
3. Close, bleed and refill the equipment or sump with fresh water.
4. Estimate the total number of litres of water in the system and add initial dosage of chemical at a ratio of 1 litre of **MACJAMES® MDSC-12** to 15 litres of water.
5. Allow contact for pipes or operate the system in the normal manner for a recommended time of 8 hours, depending on scale thickness. Check the dissolving/circulating solution every 10-15 minutes for colour change from the normal colour (refer to Calcium Carbonate spot test or PH test (2.3) below to determine when the system is cleaned).
6. Also lowering of head pressure to normal levels will indicate when the unit is clean.
7. When cleaning is complete, drain the spent solution. Disposal must be in accordance with all applicable Federal, State and Local regulations. *Note: Dilute properly, possibly to infinity, before disposing accordingly.*
8. Flush or Rinse out the system with at least two fillings of fresh water. Resume normal operations.

### 2.3 TESTING EFFECTIVENESS AND COMPLETE CLEANING

Testing the effectiveness during cleaning with **MACJAMES® MDSC-12** can be performed via two different methods. These recommended methods include a simple Calcium Carbonate spot test of the circulating solution or by charting a trend in the pH of the cleaning solution as below.

### 2.3.1 CALCIUM CARBONATE SPOT TEST

The Calcium Carbonate spot test is performed by simply having a sample of the circulating solution come in contact with a form of Calcium Carbonate. The Calcium Carbonate utilized can be a sample of the deposit you are cleaning, a Tums or even bare concrete. Observe the reaction of the **MACJAMES® MDSC-12** in solution on the Calcium Carbonate. If foaming and bubbling is observed, the solution is still active. If there is little or no reaction, the solution is expended. This test should be performed near the end of the recommended circulating time. If near the end of the recommended cleaning time the solution has been expended, more **MACJAMES® MDSC-12** will be required to complete the job. However, if the solution is still active at the end of the recommended time, all the scale has been dissolved within the application and it is ready to be water flushed and returned to service.

### 2.3.2 TESTING THE pH

The initial pH of the cleaning solution will measure between 1-3. In order to test the effectiveness of the dissolving solution as a function of pH, we recommend that the readings be taken at regular intervals and charted as a trend. The reason for this is that the deposits being dissolved may cause a premature jump in the pH and give an inaccurate reading if taken only once or infrequently. After circulating for approximately 75% of the recommended time, test the pH. Continue to take readings every 10-15 minutes to develop a trend in your readings. Once the solution's pH reads 6.0 - 7.0 on three or more readings, the solution is expended. If the pH reads below 6.0 after the recommended circulating time, the application is clean and ready to be flushed and returned to service.

### 3.0 CAUTIONARY NOTES:

- Never leave the dissolving solution in the equipment for more than 10 hours, scale may be redeposited and prove difficult to remove.
- Some reactions may occur with some alloys of aluminum, magnesium, and/or zinc.
- MDSC-12 is incompatible with strong caustics or bases.
- Refer to MSDS for further information. MSDS is readily available and are supplied with the product.

### 3.1 PRECAUTIONS

- KEEP ALL CHEMICALS AWAY FROM CHILDREN
- Use chemical resistant hand gloves during application, even though product can be held in open palm without injury. All chemicals are handled with approved PPE.
- If in contact with skin, wash with plenty water and seek medical attention if there is irritation.
- Do not drink, if ingested drink water or milk and seek medical attention.
- Avoid contact with eyes, otherwise flush with plenty water for 20 minutes and get medical attention. Remember to wear eye goggle with side protector.
- Dilute properly with water before disposal according to local regulations (dilute possibly to neutral or infinity).

## 4.0

PHYSICAL PROPERTIES			
<b>Appearance:</b>	Colourless to light cream	<b>State</b>	Liquid
<b>Odour:</b>	Moderate acidic odour	<b>Evaporation Rate (H<sub>2</sub>O = 1)</b>	≥1
<b>Specific Gravity</b>	1.15	<b>Water solubility:</b>	Complete
<b>Flammability:</b>	Not flammable	<b>Viscosity (20°C)</b>	2.8 P
<b>pH:</b>	< 2	<b>Flash Point:</b>	none
<b>Freezing Point:</b>	Below 0°C	<b>Boiling Point:</b>	>110°C



MACJAMES® MDSC-12 - DESCALER/SCALE CLEANER PACKAGE SIZES

## 5.0 HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS) RATING

<b>HEALTH</b>	<b>1</b>
<b>FLAMMABILITY</b>	<b>0</b>
<b>PHYSICAL HAZARD</b>	<b>0</b>
<b>PERSONAL PROTECTION</b>	<b>B</b>

- 0 - Minimal
- 1 - Slight
- 2 - Moderate
- 3 - High
- 4 - Very High

**NB:** Read Material Safety Data Sheet (MSDS) and label of **MACJAMES® MDSC-12 - DESCALER/SCALE CLEANER** before use and contact us at [info@macjamesglobal.com](mailto:info@macjamesglobal.com) for more information

NON-WARRANTY – All data, statements and recommendations contained herein are based upon the best information available and are believed to be reliable. However, no warranty, either expressed or implied, is made concern–ing the application of this product since the customer’s use cannot be controlled directly by MacJames.





# MINISTRY OF PETROLEUM RESOURCES

## DEPARTMENT OF PETROLEUM RESOURCES

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Ref. No: **DDR/HSE.04/003.850/2017/252**

Date: **23<sup>rd</sup> November, 2017**

The Managing Director  
Macjames Global Resources Limited  
37, Trans-Amadi Industrial Layout  
2<sup>nd</sup> Floor, Rumuobiakani  
Port Harcourt.

Dear Sir,

### RE:APPLICATION FOR REVALIDATION OF OILFIELD CHEMICAL MACJAMES MDSC-12-DESCALER/SCALE CLEANER

We acknowledged receipt of your letter of 9<sup>th</sup> November 2017, referenced MGR/DPR03/17 on the above subject.

2. Following your request and this Department's review of the attached material Safety Data Sheet for the product, we observed that **MACJAMES MDSC-12-DESCALER/SCALE CLEANER**, a Descaler/Scale Cleaner Product which was certified and approved for use in the Oil and Gas Industry in September 2014 has not changed in composition and chemical properties. Consequently, we are pleased to convey our **re-certification and revalidation approval** for the use of Macjames Mds-12-Descaler/Scale Cleaner in the Nigerian Oil and Gas Industry.
3. This approval remains valid for a period of three (3) years from the date of this letter and is subject to periodic review by the Department as deemed necessary.
4. The use of **MACJAMES MDSC-12-DESCALER/SCALE CLEANER** shall be governed by the provision of section 25 of the Petroleum (Drilling and Production) Regulations, 1969 as well as Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN 2002) which were both issued pursuant to section 9(1)(b)(iii) of Petroleum Act, 1969.
5. Furthermore, any change in the composition or reformulation of this product which could wholly or partly alter the data submitted should be promptly communicated to the Director of Petroleum Resources for the purpose of re-certification, as such changes automatically render this approval invalid.

6. Finally, this approval notwithstanding, the user of the product shall seek the approval of the DPR for the specific use under specified terms and conditions and shall remain fully responsible for any damage done to the local environment on account of the use of the product.

Yours faithfully,

A handwritten signature in black ink, appearing to be 'Abdurrahman, A.S.', written in a cursive style.

**Abdurrahman, A.S**

For: Director of Petroleum Resources