

MSA LC

MethaneSulfonic Acid - Low Corrosion

A NEW UNIQUE STRONG ACID WITH MINIMIZED CORROSION RISK TOWARDS STAINLESS STEELS

MSA LC, an innovation by ARKEMA, is the new class of low corrosion MSA available on the market that is significantly less corrosive towards 304L and 316L grades of stainless steel. This will enable users of **MSA LC** to reduce equipment replacement and maintenance costs and be more competitive.

MSA LC will improve the quality of product, by bringing in all the performance properties for which MSA is well known for and enhancing them with minimized corrosion.

MSA LC can provide superior performance in the following applications:

Esterification

- Acrylates and Multi functional acrylates
- Acetates
- Adipates
- Phthalates
- Free fatty acid conversion to vegetable oil esters
- Oleochemicals

Cleaning formulations

- Descaling
- Rust removal
- Concrete cleaner
- ...

Since **MSA LC** is essentially non corrosive towards standard grades of stainless steel, it can easily replace currently used acids, which may have either corrosion and/or quality issues (ex., yield, color, treatment of effluent wastes, etc.)

While not limited to the following, **MSA LC** is particularly beneficial in replacing sulfuric acid, para toluenesulfonic acid (PTSA), phosphoric acid, lactic acid, citric acid and glycolic acid.

In applications where the use of MSA is indicated but not used due to corrosion concerns, MSA LC is clearly the choice, allowing for its use with equipment made of standard grades of stainless steel. This will save significant capital cost associated with the need to use equipment made of higher grade steels such as 904 L and Alloy 33.

MSA LC has no odor, is non-foaming, a non-volatile organic compound (VOC), and its salt is fully biodegradable.

Please contact an Arkema representative to obtain a technical brochure specific to your application and acid use.

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THE PROOF IS IN THE RESULTS

Arkema's corrosion laboratory has performed several corrosion tests with MSA and **MSA LC** grades.

The results show the superior corrosion inhibition effect of **MSA LC**.

- Materials tested are stainless steel grades AISI 304L and AISI 316L.
- Commercial solutions of Sulfuric acid, PTSA and MSA were compared to Arkema's **MSA LC**.
- Corrosion rates >1000 $\mu\text{m}/\text{y}$ are industrially unacceptable. Values <5 $\mu\text{m}/\text{y}$ mean no quantifiable corrosion.

Tables A & B: Typical corrosion results obtained either by immersion or electrochemical test techniques

| A) Solution (in AISI 304L) : | T (°C) | Duration (days) | Corrosion, $\mu\text{m}/\text{year}$ |
|--------------------------------------|--------------|-----------------|--------------------------------------|
| Sulfuric acid 70% | 45°C | | >6000 |
| PTSA 70% | 45°C | 8 | 43 |
| MSA 70% | 45°C | 30 | >1000 |
| MSA LC 70% | 45°C | 30 | <5 |
| B) Solution (in AISI 316L) : | T (°C) | Duration (days) | Corrosion, $\mu\text{m}/\text{year}$ |
| Sulfuric acid 70% | 45°C | 8 | >2000 |
| PTSA 70% | 45°C | 8 | 48 |
| MSA 70% | 45°C | 30 | >1000 |
| MSA LC 70% | 45°C | 30 | <5 |
| PTSA 70% | 90°C | 8 | >1000 |
| MSA LC 70% | 90°C | 8 | <5 |
| MSA 70% | 160°C | 1 | >10000 |
| MSA LC 70% | 160°C | 1 | 13 |

CUSTOMERS' TESTIMONIES:

*"Our company produces some phthalates. We compared the corrosion rates of MSA 70% and **MSA LC**. We confirmed that the new **MSA LC** grade, developed by Arkema, allows for an average 40% reduction in the corrosion of stainless steel. Moreover, we recycled the **MSA LC** 10 times, with a small addition of fresh product, and the corrosion was always very low compared to normal MSA."*

*"We have compared **MSA LC** with MSA for the production of butyl and ethyl acetate. The results obtained with **MSA LC** were very positive. According to our test procedure, the 316L corrosion rate was at 200 $\mu\text{m}/\text{y}$ with MSA versus 5 $\mu\text{m}/\text{y}$ with the **MSA LC** grade developed by Arkema."*

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See MSDS for Health & Safety Considerations