

Description

ARDROX® 1277 is a liquid acid pickling solution (cleaner) suited for all magnesium alloys.

It is applied by immersion and used preferably as a component in chromium-free conversion treatments, anodizing treatments and precleaning after alkaline degreasing with the corresponding rinsing steps.

ARDROX® 1277 does not have any distinct degreasing properties and must be combined with suitable additives in such applications.

The application of ARDROX® 1277 is thus essentially limited to the removal of oxide layers and solids such as metal abrasion. The etching rate of ARDROX® 1277 is in the range of 1-3 microns per minute (depends on alloy).

Chemicals required

ARDROX® 1277
Gardobond®-Additive H 7383 or
Gardobond®-Additive H 7357 (surfactant additive)

The application and selection of surfactant additives primarily depends on the application parameters (such as pickling loss!) and should only be made after consultation with our Technical Service.

Sequence of operations

1. Alkaline cleaning, e.g. with ARDROX® 6376
2. Rinsing with plain water, second rinse zone, if required
3. ARDROX® 1277
4. Rinsing with water
5. Desmutting, if required, in ARDROX® 6376
6. Rinsing with demin water
7. Chromium-free conversion treatment, e.g. with Gardobond® X 4729, or anodizing with PGA ALGAN 2M.
8. Rinsing with water
9. Rinsing with demin water
10. Drying with hot air.

To reduce the amount of rinsing water, rinse in a multi-stage cascade. For information about the best sequence of operations, please consult Chemetall's Technical Service.

Treatment conditions

The following treatment conditions have proven suitable:

Concentration (ARDROX® 1277) :	10 - 16 g/L
Temperature:	40 - 45 °C
Free acid points (FA):	9.0 - 14.0
Total acid points (TA):	9.0 - 50.6 (max.)

Chemetall's Technical Service can determine the best conditions in more detail for individual cases.

Bath make-up

For a 1000 litres cleaning bath, use between 7.6 L (10.0 kg) and 12.2 L (16.0 kg) of ARDROX® 1277.

If ARDROX® 1277 is employed for cleaning and pickling, approx. 1.0 - 2.5 kg of a surfactant additive may be added, depending on the type of treatment.

Fill the bath tank with water and heat it to operating temperature. Next, add the make-up chemicals with continuous bath circulation. Then circulate the cleaner bath for at least 10 minutes. Check the concentration after making up the bath.

Bath control

Check the bath concentration by determining the free acid pointage (FA), the total acid pointage (TA) and by calculating the acidity ratio (TA : FA).

Before the determination, fill the bath tank with water to operating level and circulate the solution for at least 5 minutes.

Free acid pointage (FA)

Pipette 10 mL of bath solution into an Erlenmeyer flask, dilute with 100 mL of distilled water, add 10 mL of Test Solution 10 (25 % KF, neutral towards phenolphthalein) as well as 5 drops of Test Indicator 2 (phenolphthalein). Titrate with Test Solution 1 (0.1 M sodium hydroxide solution) until the colour turns pink.

The total number of mL of Test Solution 1 consumed during titration indicates the free acid pointage.

Bath concentration of ARDROX 1277

Litres/m ³	kg/m ³	Free acid points (FA)
7.6	10.0	8.7
9.2	12.0	10.4
10.7	14.0	12.2
12.2	16.0	13.9
13.8	18.0	15.7

Total acid pointage (TA)

Before taking the bath sample, bring the bath to the required concentration of free acid pointage by adding ARDROX® 1277.

With a 1000-litres bath volume, 1 free acid point corresponds to 0.88 litres (1.15 kg) of ARDROX® 1277.

Pipette 10 mL of bath solution into an Erlenmeyer flask, dilute with 100 mL of distilled water and add 3 drops of Test Indicator 2 (phenolphthalein). Titrate with Test Solution 1 (0.1 M sodium hydroxide solution) until the colour turns pink.

The total mL of Test Solution 1 consumed indicates the total acid pointage.

After a new bath make-up, the free acid pointage and total acid pointage are almost identical.

Acid ratio

Keep the free acid pointage constant during operation. The total acid pointage thus increases with the rising throughput.

When the ratio of total acid pointage to free acid pointage (TA : FA) reaches a value of 2.3, partially renew the bath or flood it to keep the acid ratio constant.

Bath replenishment

Free acid pointage

For each free acid point consumed, add approx. 0.9 litres (1.15 kg) of ARDROX 1277 for a 1000 litres cleaner bath.

Acid ratio

Adjust the fresh water supply to the bath so that a fixed acid ratio between 1.5 - 2.3 is not exceeded.

New make-up of the cleaner bath

If, after a some operating time, the result obtained is no longer satisfactory despite optimum treatment conditions, drain the cleaner bath and make up a new one. Clean the bath tank and especially the spray nozzles thoroughly before making up a new bath.

Rinsing

Rinse with water after cleaning. Operate the rinsing bath with overflow or exchange it frequently.

Bath temperature:	no heating
Spraying time:	1 - 2 minutes
Spraying pressure:	1 - 2 bar

Chemetall recommend the use of a multi-stage rinsing cascade.

Technical Service

The most favorable treatment conditions will be determined by Chemetall's Technical Service when introducing the method.

Equipment materials

Cleaner bath

Bath tank, spraying tunnel, heating elements, distributing pipes, spraying pipes and spraying nozzles: Chromium nickel molybdenum steel, material number 1.4571.

Rinsing baths

Bath tank, spraying tunnel, distribution pipes, spraying pipes and spraying nozzles: Chromium nickel steel, material number 1.4541 (limited applicability), Chromium nickel molybdenum steel, material number 1.4571.

Storage

Do not store ARDROX® 1277 at temperatures above 40 °C or below - 5 °C.

Product features

The ARDROX® 1277 concentrate is liquid, colourless/clear to slightly yellowish and has a characteristic odor.

Remark:

The incidental occurrence of a small amount of a dark deposit is product-related and is not considered as a lack in quality.

Safety guidance

Before operating the process described it is important that this complete document, together with any relevant Safety Data sheets, be read and understood.

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