MICRON
COATINGS GROUP

# OX-W
# HARD ANODIZING

OX-W is a special hard anodizing treatment for aluminum in compliance with MIL-PRF-8625 Type III, ISO 10074, and UNI 7796 standards.

Compared to conventional hard anodizing treatments, the OX-W treatment was developed to improve the properties of hard anodizing and obtain a more compact and uniform aluminum oxide film, with lower surface roughness and higher corrosion resistance.

It provides high salt spray corrosion resistance with reduced anodizing thicknesses, even on difficult-to-anodize materials such as 2000-series alloys and high-silicon cast alloys.

It is also employed to treat parts for gas distribution and control (methane, hydrogen, and oxygen), in which properties of low surface roughness and high scratch and wear resistance are required.

## FEATURES

### HIGH CORROSION RESISTANCE

The compact OX-W film protects the substrate material from corrosion, exceeding 336 hours of salt spray exposure, with no trace of corrosion.

### HIGH WEAR RESISTANCE AND HARDNESS

The hardness and compactness of the aluminum oxide layer provide high resistance to abrasive and adhesive wear, comparable to hard chrome.

### SMOOTH AND COMPACT LAYER

The OX-W treatment creates a more compact and uniform layer of aluminum oxide with lower surface roughness than that of conventional hard anodizing treatments.

### LIGHT COLOR

OX-W treatment has a light gray color with shades that depend on the treated aluminum alloy.

### OX-W-PTFE LOW FRICTION VARIANT

To reduce the friction coefficient and impart non-stick properties, the OX-W treatment can be impregnated with PTFE nanoparticles.

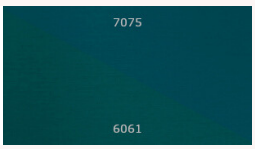
## AVAILABLE COLORS

### OX-WN - BLACK COLOR

OX-W can be pigmented deep black, providing a uniform color across different aluminum alloys.

### OX-WB - BLUE COLOR

OX-W can be pigmented blue. The shade depends on the aluminum alloy. The image shows the indicative color obtainable on alloys 7075 and 6061.




### OX-WR - RED COLOR

OX-W can be pigmented red. The shade depends on the aluminum alloy. The image shows the indicative color obtainable on alloys 7075 and 6061.

DUROX SRL
ANODIZING

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# TECHNICAL SPECIFICATIONS

## COMPOSITION AND APPLICABLE STANDARDS

### COMPOSITION

The OX-W treatment transforms the aluminum substrate into a compact layer of aluminum oxide. The coating composition is thus strongly dependent on the starting alloy.

| Al | O | S | IMPURITIES |
|---|---|---|---|
| 20÷40% | 50÷70% | 3÷5% | Depending on the alloy |

### TECHNICAL STANDARDS

ISO 10074

UNI 7796

MIL-PRF-8625 Type III

### ROHS COMPLIANCE

RoHS compliant. No restricted substances present in amounts greater than the maximum tolerated concentrations.

### REACH COMPLIANCE

REACH compliant. No SVHCs present in amounts higher than 0.1% by weight.

## ANODIZABLE ALLOYS

| WROUGHT ALLOYS | CHARACTERISTICS | |
|---|---|---|
| Series 2000 | Hardness | ★★★☆☆ |
| | Wear resistance | ★★★☆☆ |
| | Corrosion resistance | ★★★☆☆ |
| | Maximum thickness | ★★★☆☆ |
| Series 5000 (with >2% Mg) and 7000 | Hardness | ★★★★☆ |
| | Wear resistance | ★★★★☆ |
| | Corrosion resistance | ★★★★☆ |
| | Maximum thickness | ★★★★★ |
| Series 6000 (except 6082, 6061) | Hardness | ★★★★★ |
| | Wear resistance | ★★★★★ |
| | Corrosion resistance | ★★★★★ |
| | Maximum thickness | ★★★★★ |
| 6082, 6061 | Hardness | ★★★★★ |
| | Wear resistance | ★★★★★ |
| | Corrosion resistance | ★★★★★ |
| | Maximum thickness | ★★★★☆ |



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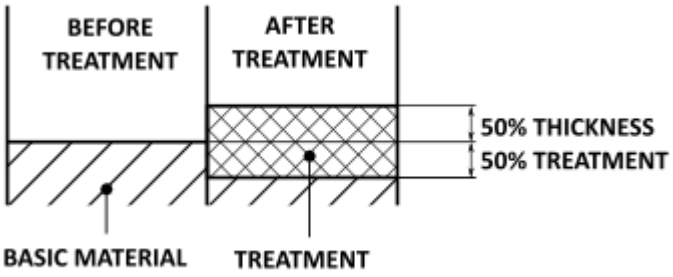
| CASTING ALLOYS | | CHARACTERISTICS |
|---|---|---|
| Alloys with Si > 8% or Cu > 2% | Hardness | ★☆☆☆☆ |
| | Wear resistance | ★☆☆☆☆ |
| | Corrosion resistance | ★☆☆☆☆ |
| | Maximum thickness | ★☆☆☆☆ |
| Die castings with Si < 8% or Cu < 2% | Hardness | ★★☆☆☆ |
| | Wear resistance | ★★☆☆☆ |
| | Corrosion resistance | ★★☆☆☆ |
| | Maximum thickness | ★☆☆☆☆ |
| Other alloys | Hardness | ★★☆☆☆ |
| | Wear resistance | ★★☆☆☆ |
| | Corrosion resistance | ★★★☆☆ |
| | Maximum thickness | ★★★☆☆ |

## TREATMENT THICKNESS AND AESTHETIC APPEARANCE

### COATING THICKNESS

| STANDARD THICKNESS | TOLERANCE |
|---|---|
| 30µm | ±10µm |

50% of the treatment thickness is due to external film growth and 50% is due to film growth in the surface of the aluminum part. The radial dimensional increase can thus be calculated as half the treatment thickness.




Uniform thickness over the entire external surface. Reduced thickness in holes.

### AESTHETIC APPEARANCE

Slightly matte appearance with light gray color. The color depends on the base alloy and the treatment thickness. Reproduces the morphology of the machined part.

Available with black pigmentation in the OX-WN version

Available with blue pigmentation in the OX-WB version

Available with red pigmentation in the OX-WR version



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## TRIBOLOGICAL PROPERTIES

### HARDNESS

The OX-W treatment features high film hardness. The value varies in accordance with the treated alloy.

| HARDNESS VALUE | ALLOY |
|---|---|
| >280HV | Series 2000 |
| >330HV | Series 5000 (with >2% Mg) and 7000 |
| >400HV | Other wrought alloys |

### WEAR RESISTANCE

OX-W offers very high abrasive and adhesive wear resistance. The value varies in accordance with the treated alloy.

| WEAR VALUE, TWI-CS17 | ALLOY |
|---|---|
| THE LOWER THE NUMBER, THE HIGHER THE PERFORMANCE - MIL-PRF-8625 3.7.2.2 AND ISO 10074 B.3- TABER ABRASER WEAR TEST - CS 17 ABRASIVE WHEELS - 1 KG LOAD | |
| < 35 mg / 10 000 cycles | Series 2000 |
| < 25 mg / 10 000 cycles | Series 5000 (with >2% Mg) and 7000 |
| < 15 mg / 10 000 cycles | Other wrought alloys |

### FRICTION COEFFICIENT

The OX-W-PTFE variant features an impregnation treatment of the anodized film with PTFE nanoparticles.
The impregnation process makes it possible to obtain a non-stick, self-lubricating surface with a low friction coefficient.

## CHEMICAL PROPERTIES

### CORROSION RESISTANCE

The OX-W treatment makes it possible to achieve high corrosion and oxidation resistance. The treated surface passes 336 hours of salt spray exposure, with no trace of corrosion.

| CORROSION RESISTANCE VALUE | SUBSTRATE MATERIAL |
|---|---|
| NSS IN COMPLIANCE WITH ISO 9227 AND ISO 10074 | |
| ≥336 hours without corrosion | 6000 alloy |



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| CHEMICAL RESISTANCE | |
|---|---|
| Indicative compatibility with operating environments. Actual resistance under service conditions must be verified in the field. | |
| ✓ | Hydrocarbons (e.g. petrol, diesel, mineral oil, toluene) |
| ✓ | Alcohols, ketones (e.g. ethanol, methanol, acetone) |
| ✓ | Neutral saline solutions (e.g. sodium chloride, magnesium chloride, seawater) |
| × | Dilute reducing acids (e.g. citric acid, oxalic acid) |
| × | Oxidizing acids (e.g. nitric acid) |
| × | Concentrated acids (e.g. sulfuric acid, hydrochloric acid) |
| × | Dilute bases (e.g. dilute sodium hydroxide) |
| × | Oxidizing bases (e.g. sodium hypochlorite) |
| × | Concentrated bases (e.g. concentrated sodium hydroxide) |



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