# Customer Information

## on green chromating with Alfipas 731

### General remarks

Alfipas 731 is a green chromating procedure for the pretreatment of aluminium and its alloys. The procedure produces greenish iridescent corrosion protection coatings on the metal surface. While the bath solution contains hexavalent chromium compounds, on the aluminium surface only chromium(VI)-free coatings mainly consisting of „chromium(III) and aluminium phosphates" are produced provided that the product is properly employed. The procedure complies with the requirements of DIN 50939 „Chromating aluminium" and has been successfully employed for many years for the corrosion protection of architectural aluminium products. Aluminium surfaces pretreated with Alfipas 731 comply with

- RoHS („**R**estriction **o**f certain **H**azardous **S**ubstances") directive 2002/95/EC for electrical and electronic equipment and
- Directive 2002/96/EC (WEEE directive = „**W**aste from **E**lectrical and **E**lectronic **E**quipment")
- Directive 2000/53/EC on end-of-life vehicles,

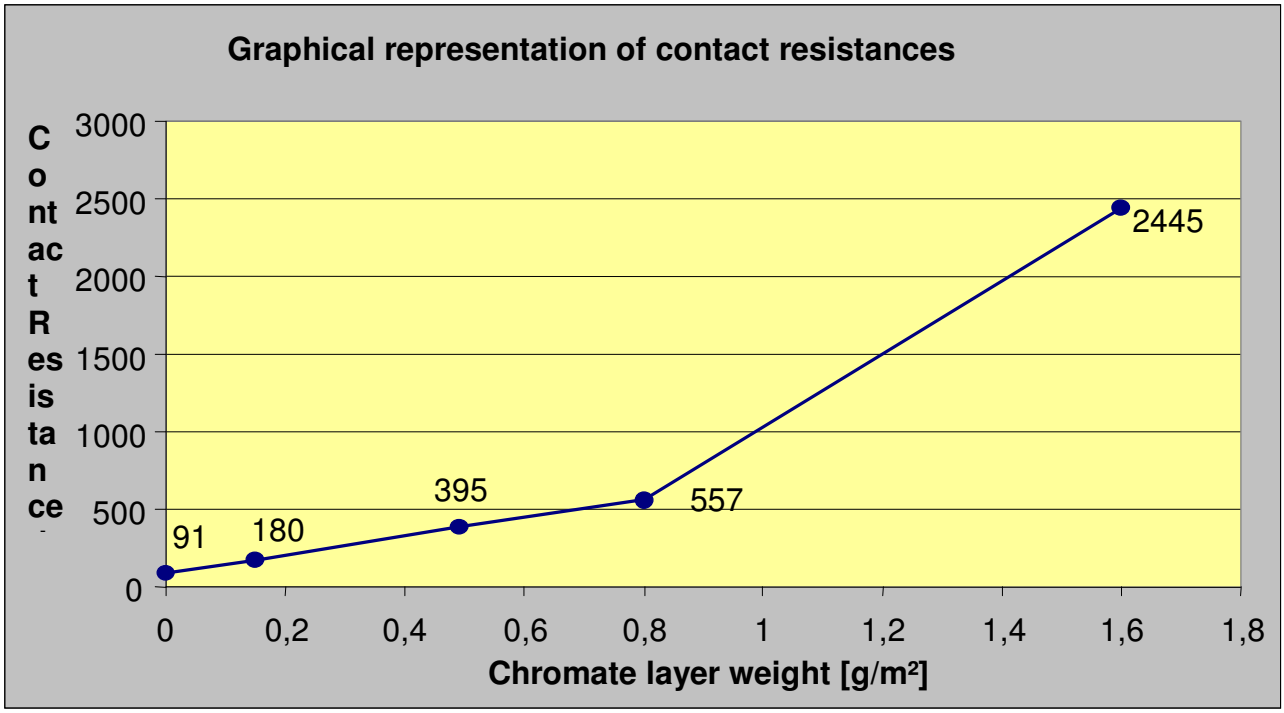
prohibiting the use of chromium(VI) in materials and components. Only a maximal concentration value up to 0.1% for Cr(VI) by weight and per „homogeneous material" is tolerated.

### Electrical resistance

For application in the electrical and electronic industries (contacting of chromated, non-coated aluminium surfaces) it is important that the green-chromated aluminium surfaces do not exceed certain threshold values for electrical resistance (contact resistance). Measurement of contact resistance of green-chromated aluminium sheets of the alloy AlMg1 with various chromate layer weights was carried out following DIN IEC 60512 (draft).

Results (mean values from the middle of the sheet):

| Material | Coating | Layer thickness [g/m²] | Measured value [mOhm] |
|---|---|---|---|
| AlMg1 | none | 0 | 91 |
| AlMg1 | Alfipas 731 | 0.15 | 180 |
| AlMg1 | Alfipas 731 | 0.49 | 395 |
| AlMg1 | Alfipas 731 | 0.80 | 557 |
| AlMg1 | Alfipas 731 | 1.60 | 2445 |




**Directive on end-of-life vehicles and IMDS**

The green-chromate coatings produced with Alfipas 731 on aluminium and aluminium alloys are included and registered in the **I**nternational **M**aterial **D**ata **S**ystem of the automobile industry www.mdsystem.com. They are shown under:

- Material (MDB) ID / version: 44904860 / 1
- MDB supplier: Alufinish GmbH & Co.KG
- Company ID: 28516

**Corrosion protection**

Corrosion protection of non-lacquered green-chromated AlMg1–sheets was tested with the following tests:

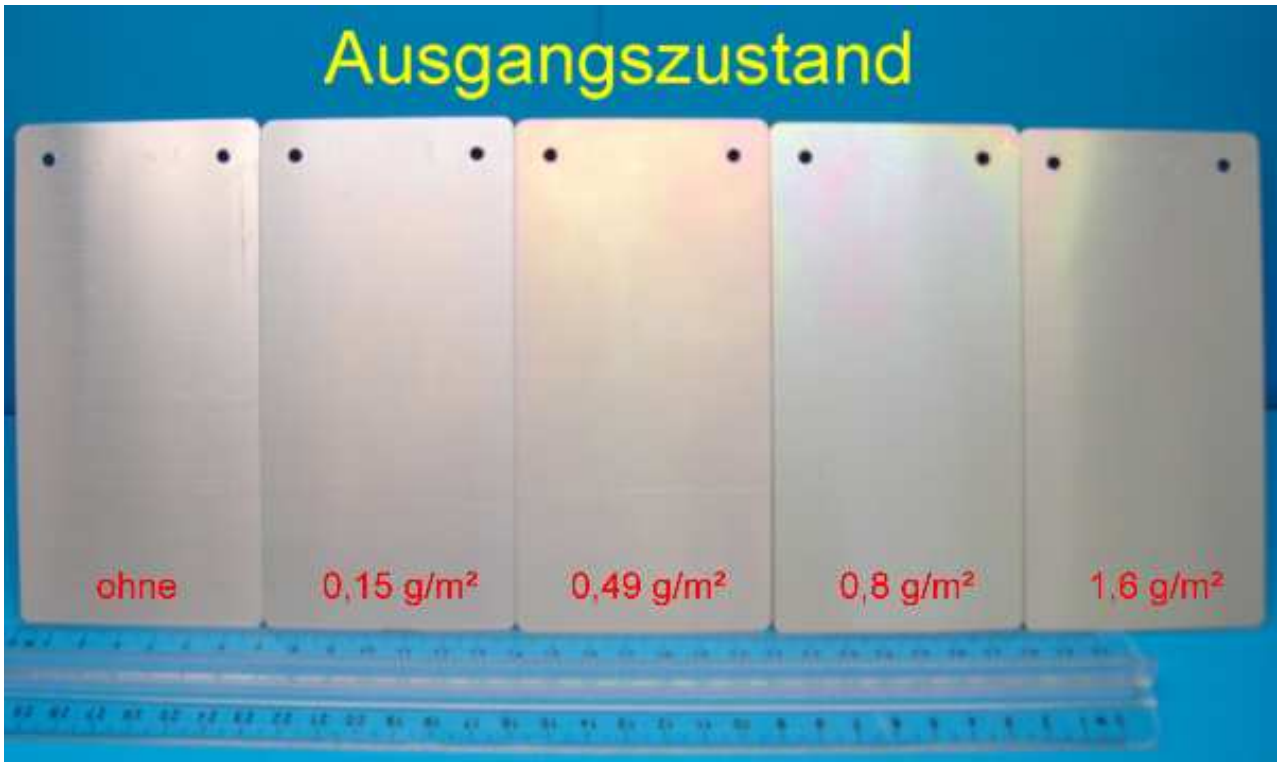
- Condensation water test in constant climate according to DIN 50017 KK
- Neutral salt spray test according to DIN 50021 SS

| **Material** | **Coating** | **Layer thickness [g/m²]** |
|---|---|---|
| AlMg1 | none | 0 |
| AlMg1 | Alfipas 731 | 0.15 |
| AlMg1 | Alfipas 731 | 0.49 |
| AlMg1 | Alfipas 731 | 0.80 |
| AlMg1 | Alfipas 731 | 1.60 |

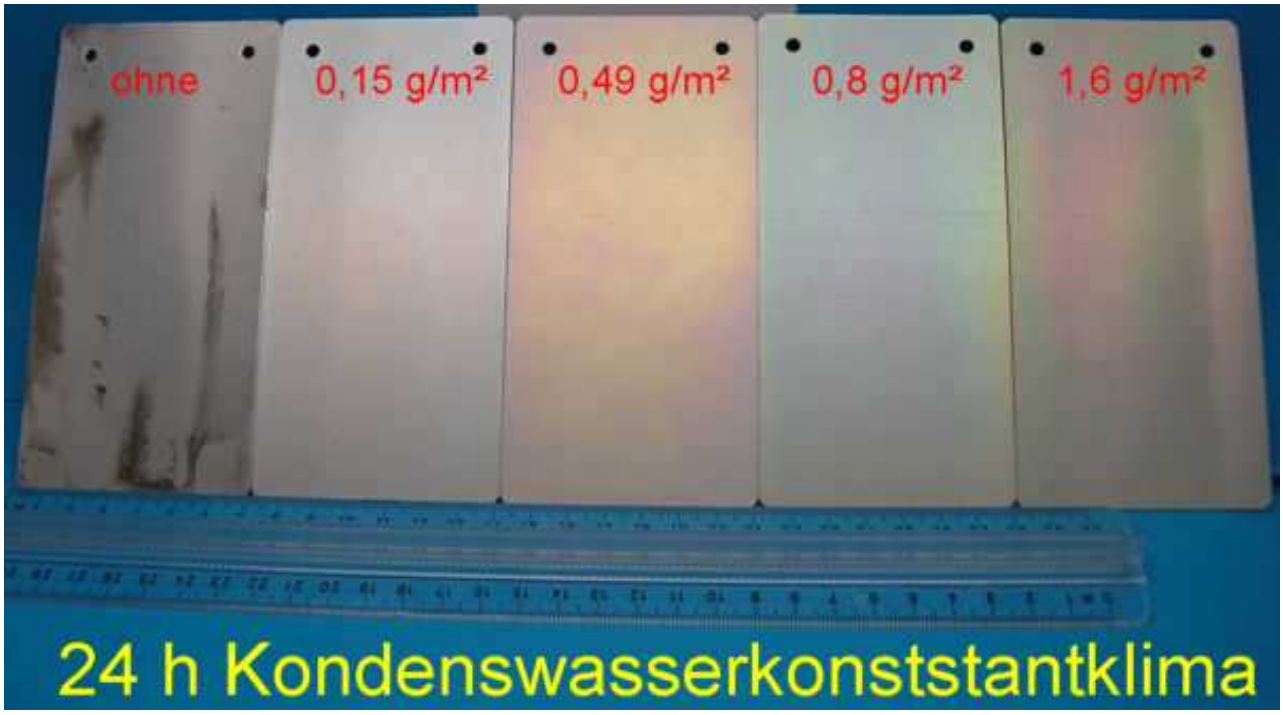
Duration of test: 340 hours in each case
Evaluation after 24 h, 168 h and 340 h

**Results**

Initial state

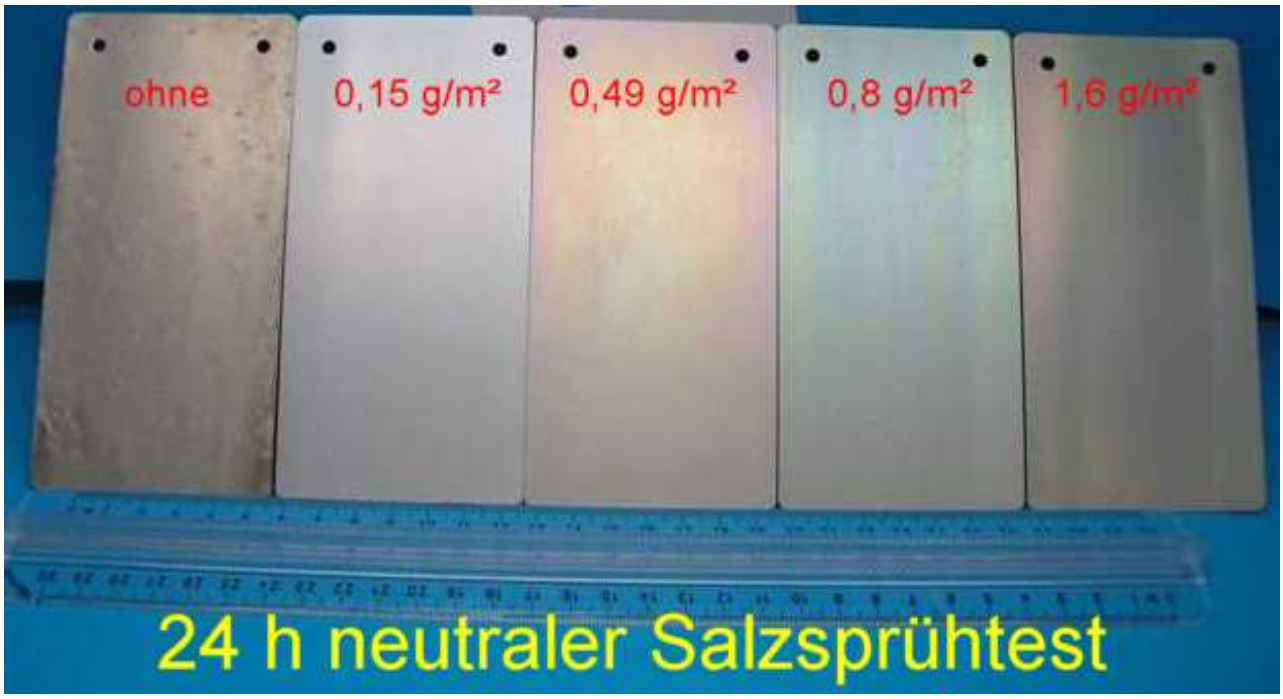



**after 24 h**




24 h condensation water constant climate

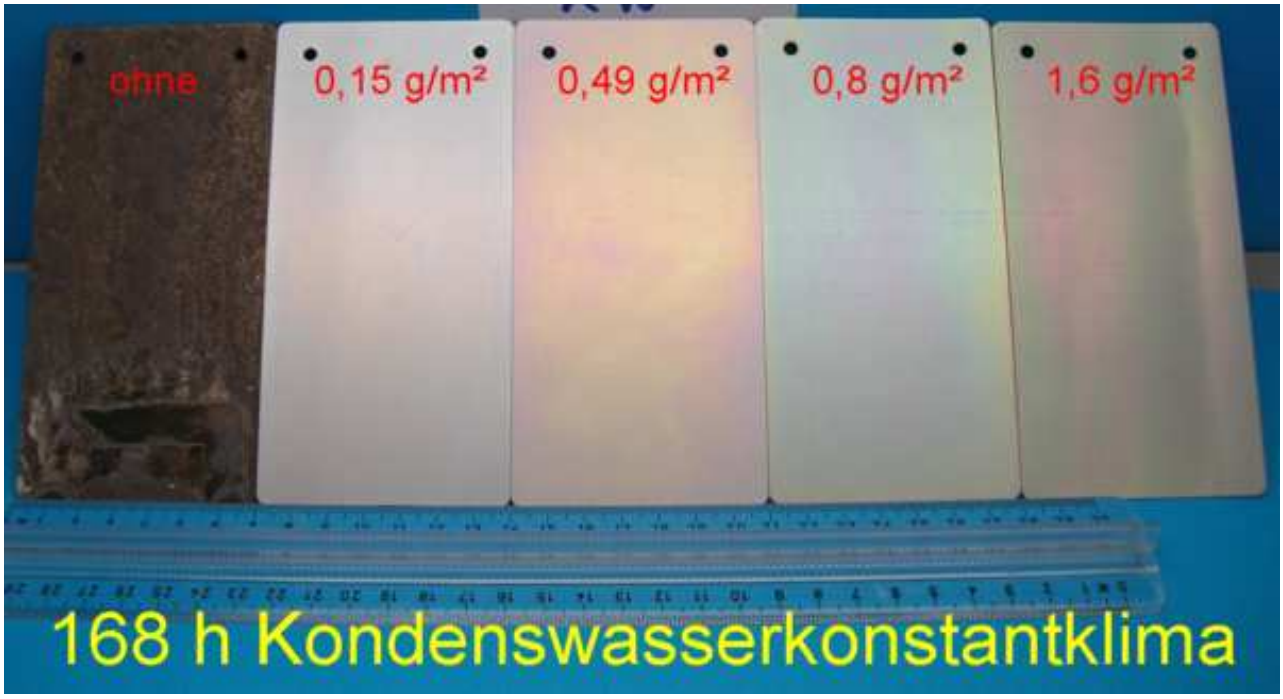
Beginning corrosion on the non-chromated aluminium surface. Remaining surfaces without corrosion.



24 h neutral salt spray test

Strong corrosion on non-chromated aluminium surface. Remaining surfaces without corrosion.

**After 168 h**



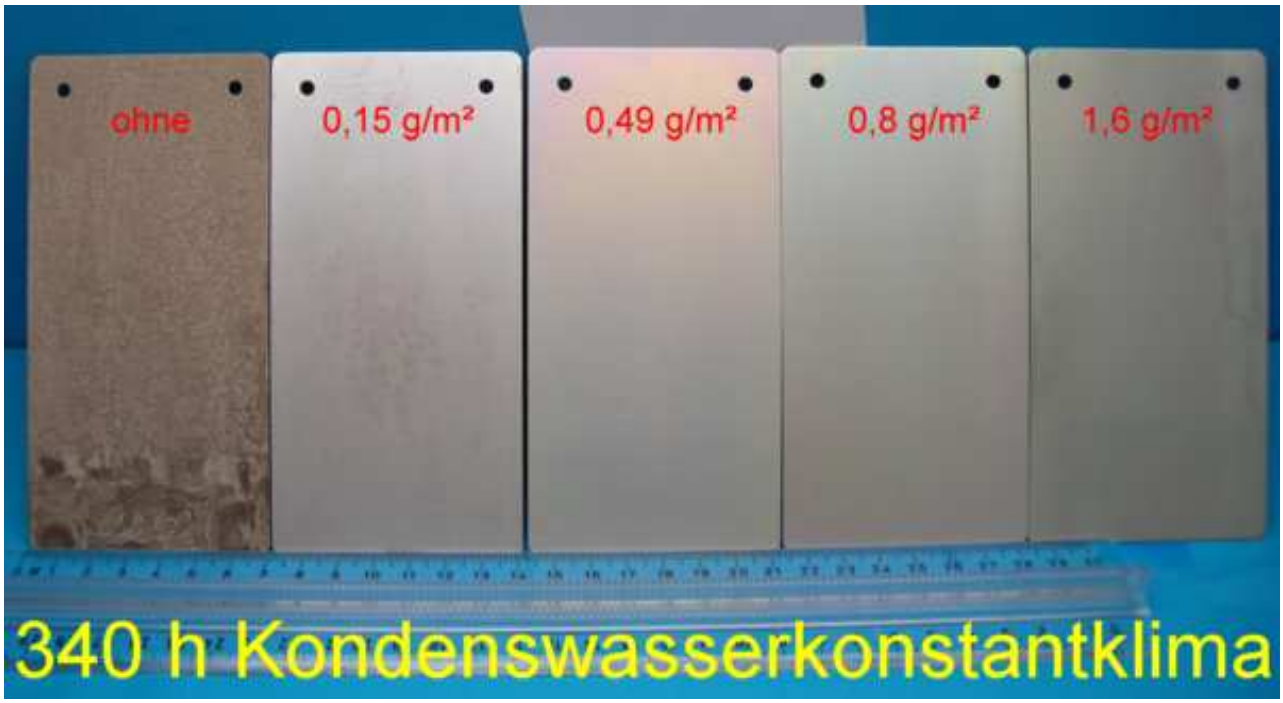
168 h condensated water constant climate

Strong corrosion and discolouration on non-chromated aluminium surface. Remaining surfaces without corrosion.

168 h neutral salt spray test

Strong corrosion on non-chromated aluminium surface. Remaining surfaces without corrosion.

**After 340 h**



340 h condensated water constant climate
Strong corrosion on non-chromated aluminium surface. Beginning discolouration on thin layer of 0.15 g/m². Remaining surfaces without corrosion.


340 h neutral salt spray test
Strong corrosion on non-chromated aluminium surface. Remaining surfaces without corrosion.

**Evaluation of condensated water test at constant climate according to DIN 50017 KK**

| Material | Coating | Layer thickness [g/m²] | 24 h | 168 h | 340 h |
|---|---|---|---|---|---|
| AlMg1 | none | 0 | beginning corrosion | strong corrosion | strong corrosion |
| AlMg1 | Alfipas 731 | 0.15 | no corrosion | no corrosion | discolourations |
| AlMg1 | Alfipas 731 | 0.49 | no corrosion | no corrosion | no corrosion |
| AlMg1 | Alfipas 731 | 0.80 | no corrosion | no corrosion | no corrosion |
| AlMg1 | Alfipas 731 | 1.60 | no corrosion | no corrosion | no corrosion |

**Evaluation of neutral salt spray test according to DIN 50021 SS**

| Material | Coating | Layer thickness [g/m²] | 24 h | 168 h | 340 h |
|---|---|---|---|---|---|
| AlMg1 | None | 0 | strong corrosion | strong corrosion | strong corrosion |
| AlMg1 | Alfipas 731 | 0.15 | no corrosion | no corrosion | no corrosion |
| AlMg1 | Alfipas 731 | 0.49 | no corrosion | no corrosion | no corrosion |
| AlMg1 | Alfipas 731 | 0.80 | no corrosion | no corrosion | no corrosion |
| AlMg1 | Alfipas 731 | 1.60 | no corrosion | no corrosion | no corrosion |