

### Almahoinc

"We are happy to contribute to your success."

#### Services Manual SM rev 4, Octobre 22, 2024

Aerospace Mechanical Medical Military Leisure

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The company Almaho inc

His history



# Almaho

### History of Almaho

"We are pleased that Almaho remains current despite the market challenges of recent years."

#### Almaho was founded in 1995

Almaho Inc. was established in 1995 when Ms. Christian Allard, Normand Massé, and André Houde decided to open a company specializing in the chemical and electrochemical surface treatment of light metals. These high-tech surface treatments serve to enhance the corrosion resistance and wear resistance of the material, as well as its aesthetic appearance. Their specialization was the anodizing of magnesium, a material that held a significant market share at that time. Unfortunately, after a few years, magnesium became very expensive, leading to a considerable drop in demand for anodizing. They then focused on their other services, such as aluminum anodizing.

#### The story of Almaho continues

A few years later, Mr. Houde decided to redirect his career. Furthermore, in 2022, Normand Massé passed away due to an illness, leaving everyone in shock but leaving an indelible mark on Almaho. The company's life continues with Mr. Allard as the sole owner.

#### Almaho, a recognized company

Almaho is now recognized in the business world as a reference in the specialization of aluminum anodizing.

#### Expertise

Our training and expertise are combined in the fields of materials engineering, electrochemistry, chemistry, and physics. Almaho offers a research and development component that gives its clients the opportunity to benefit from this expertise.

#### Thank you to all our staff !

Almaho owes its success largely to its staff. It is thanks to all these professional and conscientious men and women that we have prospered. Today, we are pleased to have a team of dynamic professionals who stay on top of new developments to meet the demands of our clients. They rise to the challenges presented to us every day.

#### Thank you to everyone!





### The company Almaho inc

Its certifications



# AS 9100

### Aerospace Certification

"The AS 9100 standard ensures our clients that Almaho's quality management meets the current needs of the aerospace industry."

### AS 9100 is the only globally recognized standard for quality management in the aerospace industry.

It is used and supported by the world's leading aerospace companies. AS 9100 is the benchmark for all organizations in this sector, including design, manufacturing, mechanical maintenance, and distribution companies. The standard's points are based on key aspects such as airworthiness, safety, compliance, and product reliability. Obtaining AS 9100 certification ensures clients of an effective quality management system and supply chains that meet today's demand requirements.

#### Almaho: a serious business

Committed to serving its clients with the most up-to-date knowledge and tools possible, Almaho has focused its efforts on ensuring the smooth execution of the various surface treatments available for your aerospace parts.

#### Next destination? Our partnership with your company.

#### Benefits of the AS 9100 Standard?

- Reduces Service Errors.
- Effective Quality Management.
- Smooth Administrative Structure.
- Meets Aerospace Requirements.
- Continuous Improvement.
- Preferred Supplier Status.



Since 2015, Almaho is officially certified AS 9100.



### ISO 9001

## Standard Certification

"The ISO 9001 standard is indispensable in today's business world. It is a distinctive mark, a symbol of quality."

### ISO 9001 is the most recognized standard in certifying a company's consistency.

It is evaluated and awarded by the International Organization for Standardization. ISO 9001 is the benchmark for most companies in various sectors such as design, manufacturing, and distribution. Obtaining ISO 9001 certification assures clients of a professional and consistent management system, product quality that meets today's modern world requirements, and a guideline for upcoming pioneering projects.

#### Almaho: a Company in Constant Progress

Almaho believes that questioning is the first step in improving a company. It encourages all its staff to analyze their functions within their work environment and to share their observations and ideas for improvements. This way, everyone contributes to the company's success.

### Why settle for yesterday when today offers the possibility to improve our tomorrow.

#### Benefits of the ISO 9001 Standard?

- Reduces Service Errors
- Effective Quality Management
- Ensures Administrative Smoothness
- Meets Today's Requirements
- Continuous Improvement
- Becomes a Reliable and Consistent Supplier



Since 1997 Almaho is officially certified ISO 9001.





### The company Almaho inc

Its services



# Services

### Safety at Almaho

"Our staff is constantly informed about new procedures and advancements. This allows them to better understand and evaluate their involvement."

#### Your parts are our top priority.

Upon reception, all parts are identified and recorded in our computer system according to your order form. The treatment of your parts does not begin if there is any ambiguity or lack of information, ensuring we fully understand your requests to protect your parts.

Once we have all the information, surface treatment begins. Each step of our various services is documented in the computer system. Upon exiting the production line, the pieces are counted on the racks and dried. Each piece is inspected according to your requirements and recorded in our system. Your parts are then packaged and identified. At all times, we know where your parts are.

#### What could be more reassuring!

#### **Understanding through Training**

Almaho's mission is to inform and educate its clients on the various factors critical to the success of the requested services.



#### **Research and Development**

Thanks to our problem-solving expertise, we will develop new surface treatments with you. We will solve your problems related to the manufacturing or finishing of parts. Our expertise will help you maximize the efficiency of your company.



## Almaho Services

"Our expertise in anodizing far surpasses that of our competitors."

#### **Aesthetic Needs?**

- Standard aluminum anodizing
- Titanium color anodizing
- Screen printing
- 3D screen printing
- Stainless steel passivation-02
- Almaho surface finish
- Mechanical & chemical surface finish
- Satin finishing

#### **Mechanical Needs?**

- Hard anodizing aluminum

#### **Conductivity Needs?**

- Masking
- Metallization & nickel plating
- Chromate conversion
- Stainless steel passivation

#### **Anti-Corrosive Needs?**

- Standard anodizing
- Hard anodizing aluminum
- Titanium anodizing
- Magnesium anodizing
- Chromate conversion
- Stainless steel passivation
- Electroless nickel plating

#### **Reworking Needs?**

- Standard stripping
- Precision stripping
- Electrochemical stripping

#### Sealing Needs?

- Teflon sealing
- Chromic sealing
- Standard sealing
- Hot water sealing
- Without sealing







### Anodizing Services

"`The only ones in Quebec with 20 colors available at all times on the floor, not to mention custom colors."



Standard anodizing is a treatment used for corrosion protection, food-safe applications, and insulation. During the process, the material swells on each wall of the piece, thus altering its dimensions.

#### Hard Aluminum Anodizing

Hard anodizing is used for mechanical reasons, resistance to constant friction, food contact, corrosion protection, and insulation. Similar to standard anodizing, the material swells on each wall of the piece, altering its dimensions.

#### **Colored Aluminum Anodizing**

Colored anodizing is applied for aesthetic purposes, corrosion protection, and insulation. The material swells on each wall of the piece during the process, modifying its dimensions.

#### **Colored Titanium Anodizing**

Titanium anodizing is used for mechanical reasons, aesthetics, corrosion protection, and insulation. A color chart is available for titanium.

#### The color chart for titanium



#### **Magnesium Anodizing**

Magnesium anodizing is used for mechanical reasons, corrosion protection, and insulation.

#### What is Anodizing?

Anodizing is an electrochemical process that uses the material of your part to create a shell (oxide layer). The thickness of the protective layer can vary according to your needs or requests.



#### There are two types of anodizing:

Standard anodizing done at room temperature, forming a less dense and thinner oxide layer, and hard anodizing done at lower temperatures, resulting in a denser and more resistant oxide layer.



### Sealing Services



"Standard sealing is an integral part of the anodizing procedure."

#### **Standard Sealing**

Used to secure the anodizing treatment and ensure the aesthetic quality of the piece. This type of sealing is used at the end of each anodizing process.

#### **Hot Water Sealing**

Used to secure the anodizing treatment and ensure the aesthetic quality of the piece. This type of sealing is used when client requirements specify a seal without chemicals.

#### **Teflon Sealing**

Used to secure the anodizing treatment and ensure the aesthetic quality of the piece. This type of sealing is used when client requirements call for a seal that provides a smooth and slippery surface.

#### **Chromic Sealing**

Used to secure the anodizing treatment and ensure the aesthetic quality of the piece. This type of sealing is used when client requirements specify a chrome-based seal.

#### **No Sealing**

Used when the anodizing treatment should not be fixed. It does not ensure the aesthetic quality of the piece. This type of sealing is used when the client needs to continue with further treatment steps after anodizing, as per the specified requirements.

#### What is Sealing a Part?

If we compare aluminum to a sponge, it consists of tiny holes called pores. During the anodizing process, these pores swell, creating the oxide layer. When anodizing is complete, the pores need to be closed to fix the treatment on the part. This is the sealing step.

#### The sealing of your parts

Pores of the aluminum in the rough



Pores of the aluminum during the anodization



Pores of the sealed aluminum



There are various types of sealing methods,

and the choice of one depends directly on the intended use of the part.



## Screen Printing Services

"Aluminum screen printing adds a touch of design and modernism to the visual aspect of your parts."



#### **Screen Printing**

This process involves applying a visual element to your parts through printing. This unconventional approach adds prestige and design to the pieces.

#### **3D Screen Printing**

This process involves creating a 3-dimensional visual element on your parts. This artistic application adds a touch of uniqueness to the pieces.

#### **Graphic Design**

Before screen printing, a digital document illustrating the visual element to be printed must be created. This document is essential for creating the films used for silk-screen printing.

#### **Film and Silk**

From the digital document, we create a film (similar to a negative from a camera). We then transfer the visual element from the negative to a screen-printing fabric, which will be the tool used for printing.

#### Template

To ensure the piece's stability during the process, a support that molds the piece must be created to hold it in place.

#### Setup

To ensure successful printing, it's crucial that the screen, the template, and the piece are fixed and manageable. The arrangement of each component is essential.

#### What is Aluminum Screen Printing?

If we compare aluminum to a sponge, it consists of tiny holes called pores. We anodize the aluminum, causing the pores to swell and create the oxide layer. We take advantage of the open pores to press ink into them. Once screen printing is completed, if necessary, we color the piece and seal it. During the sealing process, the aluminum pores close, trapping the ink within the aluminum, protecting the printed visual on the piece.



3D Screen Printing: The process for 3D screen printing follows the same steps as standard screen printing, but we do not seal it. Instead, we let the ink dry and then submerge the piece in an acid bath for a predetermined time. This creates the 3D effect.



## Chromic Services

"Trivalent chromate conversion is the accepted treatment in Europe. It complies with ROHS3 and meets environmental standards."

#### **Trivalent Chromate Conversion on Aluminum**

This treatment is used for electrical conductivity needs, paint preparation, and corrosion protection. It is in no way aesthetic. It is only transparent in color and will leave rainbow effects on the part.

#### **Hexavalent Chromate Conversion on Aluminum**

This treatment is used for electrical conductivity needs, paint preparation, and corrosion protection. It is in no way aesthetic. It is transparent in color and will leave rainbow effects or non-uniform yellow stains on the part.

#### **Chromate Conversion on Magnesium**

Often referred to as DOW 20, this treatment is used for paint preparation and corrosion protection. It is in no way aesthetic. It is yellow in color and will leave rainbow or stain effects on the part.

#### **Passivation-01 on Stainless Steel**

Often called "bleaching," this treatment is used for paint preparation and corrosion protection. It is in no way aesthetic. It is very pale yellow in color and will leave rainbow effects.

#### **Passivation-02 on Stainless Steel**

Often called "bleaching," this treatment is used for paint preparation, corrosion protection, and aesthetics. It removes welding traces. It is transparent and can leave rainbow effects.



#### What is Chromate Conversion?

Chromate conversion is a chemical process done by immersion. The deposit left by the liquid forms a very fragile protective layer on the part. Unlike anodizing, there is no swelling that changes the dimensions of the part.



Part with hexavalent chromate conversion

#### There are 2 types of chromate conversion.

Hexavalent chromate conversion, which is yellow, is not accepted in Europe due to its high chromium atom count.

Trivalent chromate conversion, which is translucent, has three chromium atoms, meeting European standards and ROHS3 class.



### Nickel Services

"Nickel metallization on polymer is an interesting alternative. You gain the flexibility of part fabrication and the added benefit of electrical conductivity."

#### **Nickel Metallization and Plating on Polymer**

Nickel metallization and plating on polymer is an electrochemical process used for mechanical purposes. It involves depositing nickel on the polymer, making it possible for a plastic part to conduct electricity. This treatment is not aesthetic.

#### Nickel Plating on Standard Steel

Nickel plating on standard steel is an electrochemical process used for anti-corrosive purposes. It involves depositing nickel on the surface of the part. This process is often requested for specific needs, usually in the form of military standards. This treatment can be aesthetic.

#### **Electroless Nickel on Standard Steel**

Electroless nickel plating on stainless steel is a chemical process used for anti-corrosive purposes. It involves depositing nickel on the part. This process is often requested for specific needs, usually in the form of military standards. This treatment can be aesthetic.



#### What is Nickel Plating?

In our use, as there are many ways to utilize it, nickel is visually represented by a metallic silver texture that resembles silver leaf. Different thicknesses of nickel deposits can be achieved depending on the client's needs. For resistance, it is similar to paint. If there is an impact or scratch, the deposit will peel off.



Part with nickel metallization

#### There are 2 modes of applying nickel:

Electrochemical process: Fusing the chemical product using current.

Chemical process only: Requiring the use of several products.



### Preparation Services

"When requesting treatment, it is important to clearly identify your needs to ensure that your parts are properly prepared."

#### Masking

Masking is a process that targets specific areas on the surface of the part that need to retain the characteristics of the raw material.

#### Cleaning

Cleaning your parts before proceeding with treatments is crucial for their complete success. Even though there is a basic cleaning done in the production line, it is essential to ensure there are no contaminants on the material. Therefore, each part is manually cleaned one by one.

#### **Standard Stripping**

This process is done chemically. It involves immersing the part in an acid that attacks the aluminum oxide layer as well as a thin layer of the raw aluminum underneath the treatment. Depending on the thickness to be removed, the immersion time can be long or short.

#### **Precision Stripping**

This process is also done chemically. It involves immersing the part in an acid that attacks only the aluminum oxide layer, not the raw aluminum underneath the treatment. Depending on the thickness to be removed, the immersion time can be long or short.

#### **Electrochemical Stripping**

This process is carried out electrochemically. It is used only in very specific cases requested directly by the client.



#### **Types of Masking**

The type of masking is determined by the shape of the area to be masked, its location on the part, the number of areas to be masked, and the precision of this area. We use our clients' plans to accurately identify the areas to be masked. With a well-detailed and clear plan, the masking procedure will be successfully executed.



Masked part ready for anodizing treatment

#### There are several types of masking.

- Liquid Products for Acids
- Self-Adhesive Applications for Acids
- Plugs/Screws
- Acid-Resistant Ink





# Almahoinc

**Our Products** 



# Finish

## Surface Finish

"The surface finish of your part directly impacts the visual outcome of anodizing."

#### **Deep Surface Finish**

There will be shading in the cavities, creating a darkening effect on the color. This will result in a dark appearance.

#### **Light Surface Finish**

The visual will be more natural but with less brightness, making the color closely match the color references.

#### Smooth Surface Finish

The brightness will be at its maximum, making the color appear lighter to the eye.

#### **Oxide Layer Thickness**

The thicker the oxide layer, the darker the natural color of the aluminum will be. If there is coloring, the color will appear impure, like a color left in sand and dust. There will be less brightness on the part, giving a prolonged satin effect.

Verify the result of your color choice with your surface finish, as the success of one can be the disappointment of the other.

#### What to Check for During Finishing?

It's crucial that your surface finishing procedure ensures consistency at every stage among the parts and on the part itself.

- The size of the gain, stone, sand
- The pattern of the brushed lines
- The execution speed
- The movement
- The pressure
- The wear of the material

### Even the same dye can result in different colors.





# Classic Finish

"The quality of your surface finish, regardless of the chosen finish, is the key to achieving a perfect anodizing result."

#### **Chemical Polishing**

This process involves immersing the part in a chemical solution. The result is a smooth, glossy surface with excellent brightness.



#### **Satin Finishing**

This process also involves immersing the part in a chemical solution. Depending on the duration, the finish will be more pronounced. It will uniform the surface, remove shine and brightness, and can provide an architectural finish.



#### **Mechanical Polishing\***

As the name suggests, this process is done mechanically. The result is a smooth, highly shiny surface with a chrome-like appearance.

#### Linear Brushing\*

This process is done mechanically. Depending on the choice of paper grain, the result will be a uniform surface with beautiful straight lines. The depth depends on the choice of paper.



#### **Orbital Brushing\***

Orbital Brushed is a process mechanically. Depending on the choice of the grain of the paper, the surface will be uniform with circular intersecting lines. The depth is dependent on the choice of paper.



#### What is a Surface Finish?

Physically, we are all capable of visually describing a surface finish, regardless of the choice of finish. However, do you understand the mechanics of the process? Would you be able to pinpoint the factor that hinders the success of the process to correct it?

### There are two very distinct approaches to achieving a surface finish.

The first is when we achieve a surface finish through a mechanical process. When sandpaper, sand grain, or a grinding wheel comes into contact with the aluminum, it causes work hardening (crushing of the aluminum). The movement must be made with the same pressure, the same motion, in the same direction while ensuring the use of the same duration and grain size. If any of these parameters change, it will result in stains appearing on the part during anodizing. Change the sanding tool frequently because, if it is too worn, it will create tears or tiny cavities in the material that will surface during anodizing.

The second is when we achieve a surface finish through a chemical process. When the product comes into contact with the aluminum, it causes an attack that eats away at the aluminum. The product parameters must be similar, and the immersion time must be exact. If any of these parameters change, it will result in a completely different surface finish appearing on the part during anodizing.

Consistency and rigor are the keys to a reproducible and similar surface finish between parts and batches.

\* Surface finishes applicable for small volume requests or specific corrections.



## Almaho Finishes

"We have developed surface finishes that, in addition to being aesthetic, also correct defects present in the aluminum."

#### **ALM-A-STAR Finish**

The ALM-A-STAR finish is used purely for aesthetic reasons. After this finish, your parts will have a mirror-like, smooth, and glossy appearance. This treatment will make each wall of the part uniform but will not correct material imperfections. The dimensions of your parts will be slightly modified during the application of this surface finish.



#### **ALM-A-STAR-Velvet Finish**

The ALM-A-STAR-Velvet finish is used for both aesthetic and corrective purposes. With this finish, your parts will appear as if they are made of shimmering sparkles. The "glamour" effect of this finish is a unique value addition to your part. This treatment will make each wall of the part uniform and will hide surface imperfections, microstructure, and porosity in the material. The dimensions of your parts will be modified during the application of this surface finish.

#### **ALM-A-Velvet Finish**

The ALM-A-Velvet finish is used for both aesthetic and corrective purposes. With this finish, your parts will look sophisticated and chic. The "velvet" effect of the finish is unique. This treatment will make each wall of the part uniform and will hide some surface imperfections, microstructure, and porosity in the material. The dimensions of your parts will be modified during the application of this surface finish.





#### What is a Surface Finish?

Over the years, Almaho has observed that defects in raw materials are common. The market pressures manufacturers to reduce the purity of their aluminum to remain competitive and profitable. However, their clients still expect the same high-quality products they have always received, which is understandable but increasingly challenging to deliver.

To address this, we have developed surface finishes that help our clients meet most of their customers' demands.

- Provides a unique presentation to the piece
- Adds value to the piece
- Conceals and corrects surface imperfections
- Masks porosity
- Hides the microstructure

#### The microstructure



Image of a part with microstructure



Anodized part with Almaho finish

Anodized part without Almaho finish





# Almahoinc

### Our contact information



## Contacts

### Quote Request and Order

"To receive an accurate quote, the information you provide must be equally precise."

#### **Communication is Key**

Effective communication is the foundation of successfully processing your treatment requests. It helps reduce non-quality, non-compliances, and issues related to anodizing and other services. This document will help you make yourself understood. It will facilitate your communications, ensuring that we all speak the same language. This way, you can ask the right questions to your clients and even anticipate some problems that may arise.

#### **Quote Request**

We have found that in some non-compliances, the source is often a misunderstanding of the quote request. It is essential that we have all the information related to the part to properly advise and respond to you. Here is a list of the information we need.

#### **Order Form**

To ensure the correct treatment is applied to the right part, the request must be very precise. Unfortunately, some order forms are vague or incomplete, which requires time and corrections. Here is the information to provide on your order form.

#### **Your Company Identification**

- Company Name
- Phone Number and Email
- Postal Address
- Point of Contact for the Request
- Their Position in the Company
- Their Phone Number
- Their Email

#### **Request Quote**

- Your Plan or Drawing of the Part
- Part Number and Description
- Part Dimensions
- Aluminum Alloy of the Part
- Part Tolerance
- Applicable Military Standard (please provide it)
- Requested Treatment and Its Thickness
- Requested Color
- If Masking, the Plan of the Masked Areas
- Quantity of Parts

#### **Order Form**

- Part Models
- Quantity of Parts per Model
- Treatments per Model
- Delivery Date and Delivery Address
- Reference Quote Number





Contacts

## All Our Contact Information

"If you have any questions about our services, feel free to reach out to us. We will be happy to answer them."

#### **Almaho Departments**

Sales Sales Director 418-833-7997 ext. 300 ventes@almaho.com

Representation Representative 418-833-7997 ext. 300 ventes@almaho.com

**R&D R&D Director** 418-833-7997 ext. 200 almaho@almaho.com

Accounting Director 418-833-7997 ext. 300 comptes@almaho.com

Quality System Ouality System Manager 418-833-7997 ext. 300 ventes@almaho.com Production Director 418-833-7997 ext. 203 production@almaho.com

Factory Production Responsible production 418-833-7997 ext. 400 production@almaho.com

**Quality Control Quality Control Manager** 418-833-7997 ext. 208 reception@almaho.com

Maintenance Maintenance Manager 418-833-7997 ext. 207 labo@almaho.com

Reception Shipping Manager 418-833-7997 ext. 400 reception@almaho.com

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Trainement de surface des métaux léges Recherche de development

### Your Notes

