QUALICOAT 3.0 FOR SPECIFIC ALLOYS FOR ARCHITECTURAL APPLICATIONS ALUMINIUM EXTRUDED PROFILES PRODUCT INSPECTION

SCOPE OF THE INSPECTION

The scope of this audit is to check the extrusion facilities (process and final product) in order to evaluate the extruded profile quality

EXTRUSION COMPANY

NAME: .....

ADDRESS: .....

TEL: .....

DATE OF INSPECTION: ….....

TESTING LABORATORY ……

INSPECTOR: .....

CONTACT PERSON: .....

E-MAIL: .....

TYPE OF INSPECTION

☐ IMPLEMENTATION OF QUALICOAT 3.0 SPECIFIC ALLOY

ALUMINUM SERIES …….

TYPE ……...

APPLICANT ……..

☐ DOES THE COMPANY HAVE APPROVED SPECIFIC ALLOYS?

☐ YES NO ☐

Is the inspection unannounced? ☐ YES NO ☐

Is an inspection possible? ☐ YES NO ☐

Description of the work/building ……...…

Location /Address ……

Size of project:

- Expected Duration of the project (years)*: ……

Recommended number of inspections (depends on the size of the work): ……

☐ First visit ☐ Second visit ☐ Others

**At least one inspection shall be carried out every six months of duration of the project.*

REMARKS:

1. STORAGE CONDITIONS OF BILLETS

Do the storage conditions comply with the supplier's specifications?

☐ YES ☐ NO

The surface of the billet shall be free of oxides produced during storage in the open air and slag or inclusions from the casting (visual assessment).

☐ YES ☐ NO

REMARKS:

2. RAW MATERIAL

2.1 Type of alloy

☐ AA 6060 ☐ AA 6063 ☐ OTHERS: ……..

☐ PRIMARY ALUMINIUM

☐ SECONDARY ALUMINIUM

☐ PRE-CONSUMER ALUMINIUM ☐ POST-CONSUMER ALUMINIUM

Declared percentage of the aluminium used for producing the billet:

Primary: …… Pre-Consumer: …… Post-Consumer: ……

2.2 Surface quality of billet received from supplier

Is the surface of the billets free from defects?

DEFECTS	REQUIREMENTS	ASSESSMENT
Oxides	NO	
Metallic inclusions, slags	NO	
Bumps, stipes	NO	
Surface uniformity (Surface quality)	YES	

☐ YES ☐ NO

REMARKS:

2.3 Labelling

Does it include the type of alloy?

☐ YES ☐ NO

Does the billet include a supplier's label?

☐ YES ☐ NO

The information contained in the label comply with the supplier’s specifications?

☐ YES ☐ NO

If yes, the information assures the traceability of the material?

☐ YES ☐ NO

REMARKS:

2.4 Pre-cut billets surface before extrusion process

Is the surface of the billets free from defects?

☐ YES ☐ NO

Is the cut orthogonal to the billet walls? (visual assessment).

☐ YES ☐ NO

2.5 Extruded profiles surface

The surface of the extruded profiles is exempt of defects? A visual assessment will be made according to appendix A13.

DEFECTS	REQUIREMENTS	ASSESSMENT
Die lines		
Strikes		
Tearing		
Metallic inclusions, slags		
Dark bands		
Blistering		
Pick-up		
Surface uniformity (Surface quality)		

☐ YES ☐ NO

3. ADDITIONAL EQUIPMENT TO EXTRUSION PRESS

3.1 Preheating billet system

Type of oven: ☐ Gas ☐ Induction

The oven is working properly? ☐ YES ☐ NO

3.2 Die assembly cooling system

The container is cooled by liquid nitrogen? ☐ YES ☐ NO

3.3 Extrusion dies

Is its cleanliness and tolerances periodically reviewed between extrusion cycles?

☐ YES ☐ NO

It has a nitriding equipment plant for dies?

☐ YES ☐ NO

The extrusion desk has contact points made by y graphite?

☐ YES ☐ NO

3.4 Extruded profile cooling system

Type of cooling: ☐ Air ☐ Nebulised Water ☐ Water

3.5 Stretching

Is this system available? ☐ YES ☐ NO

Is possible the control of the applied load and the deformation produced?

☐ YES ☐ NO

Are the data registered? ☐ YES ☐ NO

REMARKS:

4. AGEING OVEN SYSTEM

Is the equipment available? ☐ YES ☐ NO

Oven typology ☐ Gas ☐ Electric

Conditions measured

TEMPERATURE	TIME

Are there written procedures of the ageing parameters? ☐ YES ☐ NO

Are there conditions measured conform? ☐ YES ☐ NO

REMARKS:

5. CONTROL OF EXTRUSION PROCESS PARAMETERS

5.1 Preheating billet

- Pre-heating temperature

RECOMMENDED	MEASURED
≤ 450ºC	

Correct ☐ YES ☐ NO

- Pre-heating time

MEASURED (min)

Are there conditions measured conform to written procedures? ☐ YES ☐ NO

5.2 Billet temperature before pressing

- Temperature

REQUIRED	MEASURED
400-450 ºC	

Correct ☐ YES ☐ NO

- Time

MEASURED (min)

Are there conditions measured conform to written procedures? ☐ YES ☐ NO

5.3 Extruded profile temperature at exit of the die

RECOMMENDED	MEASURED
≤ 580 ºC	

5.4 Dumper pressure applied

MEASURED (MPa)

5.5 Extrusion rate of profile

MEASURED (m/min)

5.6 Cooling rate of the profile

RECOMMENDED	MEASURED

Note: as a general rule the cooling rate is 1°C per each second of cooling

5.7 Butt end size

RECOMMENDED	MEASURED
3-5%	

REMARKS:

6. ALLOY COMPOSITION (According to the extruder documents)

Codification	ASSESSMENT									
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Mg/Si	Fe/Si

Satisfactory: ✓
No Satisfactory: ×

☐ SATISFACTORY ☐ NOT SATISFACTORY

REMARK: If this information is not available, complete Annex I with the laboratory data

7. VISUAL ASSESSMENT EXTRUDED PROFILE

Codification	DEFECT ON SURFACE	ASSESSMENT[1]
	Die lines	
	Strikes	
	Tearing	
	Dark bands	
	Blistering	
	Pick-up	
	Inclusions	
	Overpressure extrusion	
	Slag	
	Oxides	

ASSESSMENT ☐ SATISFACTORY ☐ NOT SATISFACTORY

8. TRACEABILITY

Are the profiles properly identified?

☐ YES ☐ NO

References for specific alloys

Are the references for specific alloys properly indicated and available for the inspector?

☐ YES ☐ NO

9. IN-HOUSE CONTROL

		CONFORMITY	
DATA RECORDED	MINIMUM FRECIENCY	YES	NO
Production date	Every order		
Production order	Every order		
Reference to cast order	Every order		
Costumer name	Every order		
Alloy and temper	Every order		
Preheating billet - T^a	Every order		

Tª at exit of die	Every profile reference		
Dumper pressure	Every profile reference		
Extrusion rate	Every profile reference		
Cooling rate	Every profile reference		
Bit size	Every order		
Cleaning liner cycles	When the alloy is changed		
Stretching data	Every order		
Aging parameters - Tª - Time	Every load		
Profile visual assessment	Continuous control		

REMARKS:

Date:

Inspector's signature

Authorized plant representative's signature

ANNEX I

1. ALLOY COMPOSITION (OES)

According to the laboratory documents

Laboratory .....
Nº Report .....

Codification	ASSESSMENT									
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Mg/Si	Fe/Si

Satisfactory: ✓
No Satisfactory: ×

☐ SATISFACTORY ☐ NOT SATISFACTORY

2. ANODIC CYCLE POLARIZATION

Codification	ASSESSMENT Corrosion potential
TXXX-XX-XX	XXXXX
TXXX-YY-YY	
TXXX-ZZ-ZZ	

3. METALLOGRAPHIC STUDY

3.1 Without polishing process

Codification	ASSESSMENT
TXXX-XX-XX	XXXXX
TXXX-YY-YY	
TXXX-ZZ-ZZ	

3.2 With polishing process

Codification	ASSESSMENT
TXXX-XX-XX	XXXXX
TXXX-YY-YY	
TXXX-ZZ-ZZ	

3.3 Metallographic study on polishing samples with chemical etching

Codification	ASSESSMENT
TXXX-XX-XX	XXXXX
TXXX-YY-YY	
TXXX-ZZ-ZZ	

CONCLUSIONS