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Finishing Standards including Colour Codes for Metal Parts for Suppliers

Purpose:

This document outlines Alpha Technologies Ltd. (“ATL”) standard finishing requirements and associated colour codes for metal custom manufactured, fabricated or otherwise processed parts.

Scope:

This document applies to all suppliers who supply to ATL manufactured, fabricated or processed parts as part of meeting the contractual requirements of an ATL-issued and supplier accepted Purchase Order. Specific requirements within this document apply as appropriate to the parts or services being supplied to ATL.

Definitions:

ATL: Alpha Technologies Limited.

ATL Part Number: The unique identifier applied to an ATL-custom designed or manufactured part. This number is explicitly noted on any ATL-provided drawing(s) as well as the ATL PO.

Batch Code: WW-YYYY where WW is the work week and YYYY is the calendar year that corresponds to the date of manufacturing of a part.

Revision: A character or digit that identifies a unique configuration of a part. The revision of a part will, in general, increment if a change is made to the configuration.

Supplier: An organization that supplies finished goods, raw materials and/or services to ATL.

Supplier Part Number: A Supplier-generated and controlled unique identifier, if one exists, that is applied to a Supplier standard part. This number may be noted on ATL POs.

Supplier Code: ATL-assigned four-digit code which is a unique identifier for an ATL Supplier.

This code is noted on the ATL PO, beginning with “V” (zeroes that trail the “V” character only may be dropped i.e.: “0164” or “164” may be used in place of “V000164”, but “16” would not be an acceptable substitution for “V000160”).



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1.0 General Requirements:

- All finishes must be RoHS compliant.
If a particular finish specification does not meet RoHS, please notify ATL immediately.

1.1 Painting Requirements:

- All screw threads must be free of paint.
- All hinges shall be free to turn as intended after finishing.
- Painted surfaces shall be uniformly smooth, with no visible imperfections, when viewed from a distance of 3 feet with the unaided eye. The following conditions are unacceptable:

A. Wrong Colour

Colour or gloss, which deviates from specification or contrast requirements

B. Poor Coverage

Paint, which does not cover or extends beyond specified areas

C. Scratches

Rubs, tears, or scrapes, which damage the paint surface or which expose base metal or primer coats

D. Smudges, Mars, or Blemishes

Surface imperfections introduced during painting or drying that affect the appearance of the paint coat, such as smears, streaks, or blurry areas.

E. Blisters, Voids, or Chips

Painted surfaces that exhibit signs of poor adhesion to the base metal, gaps or openings in the coating, or fragments broken out of the surface, which are visible to the naked eye.

F. Orange Peel

Paint coating where the skin exhibits a rough or wrinkled appearance like the outside of an orange.

G. Sags and Runs

Paint coatings, which exhibit irregular surfaces due to uneven paint flow.



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H. Rough Coating

Paint coating where the surface lacks smooth appearance due to improper spray technique. Roughness of the coating may be detected by running the fingertips across the painted surface.

I. Contaminated Coating

Coatings which are rough or irregular due to application over sand, dirt, grit or metal particles.

J. Excessive Paint

Surfaces where the coating exhibits noticeable layering or global formation due to application of a more than adequate amount of paint or improper touch-up.

K. Thin Coating

Coatings that fail to obliterate the background over which it is applied due to insufficient paint application or insufficient hiding power of the coating. The resulting surface allows the base metal to show through the surface coat.

L. Wet Paint

Paint coatings that are wet, tacky, soft or uncured due to insufficient drying time or improper mixing.

1.2 Powder Coating Requirements: • Powder coating design thickness: 0.0015” – 0.0040” unless otherwise specified on an ATL drawing.

- All screw threads must be free of powder coat.
- All hinges shall be free to turn as intended after finishing.
- All finishes must be RoHS compliant. If a particular finish specification does not meet RoHS, please notify ATL. immediately.
- Surface classifications A, B, and C will be viewed from an at-arms-length distance, allowing 10 seconds per surface.
- Level A = Critical Surface
- Level B = Other Sides
- Level C = Internal
- The design specification shall override any conflicts between it and this specification.



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Acceptance Table

Defect Type	Size	Level A	Level B	Level C
Scratch	1" L X 1/8" W	0	0	4
Non-Adhesive	1/4" Dia.	0	0	3 for a total of 1/4" Dia.
Stain & Discolour	Equal to .25	0	1	3
Dents/Pits with surface coverage tack	1/4" Dia.	1	3	3
Foreign Material/ Debris	1/4" Dia.	1	2	3

* At no time will a defect of type "peel" totaling more than 1/4 inch in diameter be accepted.

1.3 Silkscreening Requirements:

- Silkscreen per ASTM D3359.
- All materials must be RoHS compliant.

1.4 Electrocoating Requirements:

- Electrocoating design thickness: 0.0004" – 0.0012" unless otherwise specified on an ATL drawing.

1.5 Cleanliness and Post Processing Requirements:

All parts shall be clean and free from residual manufacturing substances including but not limited to:

- Machining lubricants and coolants;
- Oils or grease;
- Mold release agents; and
- Excessive dirt, dust, or machining byproducts such as shavings.

Unless otherwise specified by the ATL drawing, remove all burrs and break sharp edges .005" to .015" max.



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2.1 Inorganic/Metallic Coating/Plating

Code	Description	Applicable Substrate	Plating/Coating Specification
101	Yellow Chromate conversion (a.k.a. gold Alodine or gold Irridite)	Aluminum	Conversion coating per MIL-DTL-5541F, Class 3, Type II
102	Clear Chromate conversion (a.k.a. clear Alodine or clear Irridite)	Aluminum	Conversion coating per MIL-DTL-5541F, Class 3, Type II
103	Clear anodize	Aluminum	Anodize per MIL-A-8625F, either Type I, IB, IC, II or IIB are acceptable, Class 1, non-dyed
104	Black anodize	Aluminum	Anodize per MIL-A-8625F, either Type I, IB, IC, II, or IIB, are acceptable, Class 2, dyed black
105	Bright Electro Tin plated Class B	Copper, Brass, Aluminum, Iron and Steel	ASTM B545-97 Class B (minimum 5um) for electrical contact application, with minimum 1.3um thick porous free Nickel underplating.
106	Matte Electro Tin plated Class C	Copper, Brass, Aluminum, Iron and Steel	ASTM B545-97 Class C (8um) for soldering application, with minimum 1.3um thick porous free Nickel underplating.
107	Zinc Plated minimum 5um(0.0002") thick, Clear Chromate Conversion	Iron and Steel	Zinc Plating Per ASTM B633-98, Service Condition 1 (mild), Type III with Colourless Chromate Conversion
108	Zinc plated minimum 8um (0.0003") thick, Clear Chromate Conversion	Iron and Steel	Zinc Plating Per ASTM B633-98, Service Condition 2 (moderate), Type III with Colourless Chromate Conversion
109	Zinc plated minimum 12um (0.0008") thick, Yellow Chromate Conversion	Iron and Steel	Zinc Plating Per ASTM B633-98, Service Condition 3 (severe), Type II with Yellow Chromate Conversion
110	Zinc plated minimum 25um (0.001") thick, Yellow Chromate Conversion	Iron and Steel	Zinc Plating Per ASTM B633-98, Service Condition 4 (very severe), Type II with Yellow Chromate Conversion
111	Zinc plated minimum 25um (0.001") thick Black Chromate Conversion	Iron and Steel	Zinc Plating Per ASTM B633-98, Service Condition 1 (mild), with Black Chromate Conversion
112	Steel, hot dip galvanized (Zinc coating)	Iron and Steel	Zinc (hot-dip galvanized) coating per ASTM A123/A123M.



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Code	Description	Applicable Substrate	Plating/Coating Specification
113	Matte Electro Tin plated Class B	Copper, Brass, Aluminum, Iron, and Steel	ASTM B545-97 Class B (minimum 5um) for electrical contact application, with minimum 1.3um thick porous free Nickel underplating
114	Silver Plated, Semi-bright, (2.5um minimum)	Copper, Brass, Aluminum*, Iron and Steel	ASTM B700-90 Type 1, Grade D (99.9% pure, semi-bright), Class N or S. Coating thickness: minimum 2.5uM for electrical contact application. *Consult plating supplier before specifying with Aluminum substrate.
115	Black Oxide Coating	Iron and Steel, including Stainless Steel	Black Oxide Coating per ISO 11408.
116	Reserved for Chrome Plated	TBD	TBD

2.2 Organic Coating:

Code	Description	Approved Powder Coat
201	ASA-61 Gray, Semi-gloss, Powder Coat	Tiger Drylac 49/70050 ASA-61 Gray Polyester Powder Coat (UL Recognized) Cardinal T008-GR736 Gray Powder Coat (UL Recognized)
202	Gray leatherette, Textured, Powder Coat	Protech HT212A4 (was H1000AT4) Textured Gray Hybrid Powder Coat (UL Recognized)
203	Black, Semi-gloss, Powder Coat	Protech PS311N13 (was DS311N12) Semi Gloss Black TGIC Polyester Powder Coat (UL Recognized)
204	Light tan, Powder Coat	Glidden Pulvalure 6DI06 Lite Tan TGIC Polyester Powder Coat (UL Recognized)
205	Clear coat	Tiger Drylac 39/00020 TGIC Polyester (UL Recognized)
206	Midnight blue, Powder Coat	Protech PS211B2 (was P100B2) Midnight Blue TGIC Polyester Powder Coat (UL Recognized)
207	Platinum, Powder Coat	Protech HS412H36 (was H1000H36) Platinum Hybrid Powder Coat (UL Recognized)



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Code	Description	Approved Powder Coat
208 *	Textured Blue	Textured Polane, Pantone #281C Blue (Pending powder coat P/N)
209	Black, Gloss, Powder Coat	Cardinal T009-Bk12 #17038 Black TGIC Polyester Powder Coat
210	Sea foam green, Powder Coat	H.B. Fuller Kativo IF-2411 Sea Foam TGIC Polyester Powder Coat Morton 20-6023 Corvel Green Polyester Powder Coat Tiger Drylac 249/52200 Alpha Sea Foam Green Polyester Powder Coat Cardinal 6408-14672
211	White, Powder Coat	Protech P100W14 White TGIC Polyester Powder Coat (UL Recognized) Tiger Drylac Polyester 39/10160 Horizon White (UL Recognized) Cardinal T009-WH11 Horizon White Powder Coat Sherwin Williams PWS9-01169
212	Flat Black, Powder Coat	Morton Thiokol 80-7001 Corvel Solar Black TGIC Polyester Powder Coat Cardinal #E300-BK147 Flat Black Epoxy
213	Gray, Textured, Powder Coat	Protech PC 4732 Blue-Gray Textured Hybrid (Epoxy/Polyester) Powder Coat
214	Gray, Textured, Epoxy Polyester Powder Coat	Cardinal H312-BG160 Beige Textured Epoxy Polyester Hybrid Powder Coat Sherwin-Williams H-2415-2T Pro Grey Texture
215	Safety red, Powder Coat	DOW Plastics ENVELON Series Safety Red (SR) Powder Coat Cardinal T009-RD03 TGIC Polyester Powder Coat. Axalta PFR400S9 RED BARON TGIC-Polyester Powder Coat
216	Beige, Polyester Powder Coat	Tiger Drylac Series 49/70520 (RAL9002) TGIC Polyester Powder Coat
217	Light Silver, Polyester Powder Coat	Tiger Drylac Series 38/91020 Anodized Silver TGIC Polyester Powder Coat
218	Dark green, Semi-gloss, Polyester Powder Coat	Cardinal C006-GN03 Green TGIC Free Polyester Powder Coat, Semi Gloss Smooth Green
219	Light Silver, Polyester Powder Coat	Tiger Drylac Series 38/91020 Anodized Silver TGIC Polyester Powder Coat

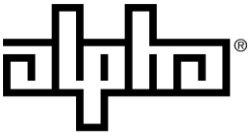
For more information visit www.alpha.com

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Code	Description	Approved Powder Coat
220	White	Apollo White Glossy, Tiger Drylac #39/10210
221	Fieldstone tan	Sherwin-Williams 47982 Code F2NG59 Fieldstone Tan
222	Black, textured , Epoxy Powder Coat	Protech ET442N2 (was E2000NT2) Textured Black Epoxy Powder Coat
223	Light blue, Polyurethane	Cardinal 6405-6842 Light Blue Polyurethane
224	Dark Blue, Polyester Powder Coat	Cardinal TO32-BL64 Dark Blue TGIC Polyester Powder Coat
225	White, Polyester Powder Coat	Hentzen P4156WPC White TGIC Polyester Powder Coat
226	Charcoal Gray, Polyester Powder Coat	Cardinal C241-GR663 Charcoal Gray Polyester Powder Coat
227	Almond, Semi-gloss, Powder Coat	Fuller O'Brien #PFT-500-S8 Almond, Semi-Gloss Powder Coat. Tiger Drylac Series 39/15020 Almond Smooth Glossy
228	Hybrid Gray	Tiger Drylac 459/70150 Cardinal GR1465-C004 Sherwin Williams PAS400623
229	Central Office White, Powder Coat	Dupont China AD3000-9181536 TGIC Type Powder (White) Dupont (O'Brien) UFW563S3 Polyester Powder Coat (for application of Pantone Cool Gray 1)
230*	ASA61 Gray, Semi-Gloss, Powder Coat (UL Recognized)	Glidden No.5 Pulvalure Gray Powder Coat (UL Recognized) Fuller Kativo IF-3164 (KUR-13255-40) Gray Polyester Powder Coat (UL Recognized) Morton Thiokol 20-7056 (U1575-17056) Powder Coat (UL Recognized) Protech PS311A13 (was P1000A13) ASA61 Gray Polyester Powder Coat (UL Recognized) (Pending verification if this is the same as #201)
231*	Gray, Textured, Polyester Powder Coat	Tiger Drylac 449/71190 Fuller Kativo 3449-12B Blue-Gray Textured TGIC Polyester Powder Coat (Pending verification if this is the same as #213)



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Code	Description	Approved Powder Coat
232	Warm Gray 3C	Calix #3C Warm Gray – Cardinal T032-GR693 – Polyester TGCI Powder Coating Semi Gloss Texture LS#4266
233	Metallic Brown, Polyurethane	Protech UM512M48 Polyurethane (smooth, metallic brown)
234	Exterior Gray, Polyester Powder Coat	Spectrum GY10 SP618 Cardinal - Gray Quartz Exterior p/n# T243 GR301 Polyester Powder Coat
235*	Charcoal Gray	Newbridge Charcoal Gray (pending powder coat P/N)
236	Motorola Shadow Black, Polyester/Epoxy Powder Coat	Spectrum BK10 SP241 Morton Thiokol 20-7304 Polyester Powder Coat Morton Thiokol 10-7393 Epoxy Powder Coat
237	Charcoal Gray	Tiger Drylac (China and Canada) 49/80076 - Polyester TGIC Powder Coat. Sherwin Williams PAT100705
238	Light Gray	Cardinal GR142-T241
239	Telco Green, Powder Coat	Spectrum GN80-P235 – Polyester Powder Coat – High Gloss Texture
240	Off White	Cardinal BG583-T038 - Polyester TGIC Powder Coat - High Gloss Texture
241	Spruce Green	Protech PS311G644 - Polyester TGIC
242	“Traffic” Green	Cardinal T007-GN16 - Polyester TGIC Powder Coat -High Gloss Smooth
243	Black, Textured, Semi-Gloss, Polyester Powder Coat	Cardinal C241-BK01 - Polyester Powder Coat (TGIC free) Hua Cai Yuan TH1646 (China) Sherwin Williams PBT100607 Sherwin Williams RBT100005 (TGIC free)
244	Black, Epoxy Electrocoat	PPG Powercron 6000CX Epoxy Electrocoat
245	Signal Grey Smooth Glossy (RAL 7004)	Tiger Drylac 49/73300 - Interior/Exterior, Weather Resistant TGIC Polyester Powder Coating
246	Cream, Smooth Glossy (RAL 9001)	Protech TD6204-5 – Erie Anti-Graffiti Polyurethane Coating, Color (RAL 9001) Cream, Smooth Glossy



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Code	Description	Approved Powder Coat
247	Warm Gray 1C	Calix #1C Warm Gray – Cardinal T032-GR692 – Polyester TGCI Powder Coating Semi Gloss Texture LS#4262
248	Nut Brown, Glossy (RAL 8011)	Tiger Drylac 49/66100 - Interior/Exterior, Weather Resistant TGIC Polyester Powder Coating, Color Nut Brown (RAL 8011), Glossy
249	Gray Aluminum, Metallic, Glossy (RAL9007)	Tiger Drylac 49/92880 - Interior/Exterior, Weather Resistant TGIC Polyester Powder Coating
250	Light Gray, Low Gloss (RAL7035)	Envirocron PCTC 70268, Exterior Polyester Powder Coating (RAL7035), Low Gloss Cardinal T013-GR185
251	White, Textured, Semi-Gloss, Polyester Powder Coat	Cardinal #C031-WH120, Polyester Powder Coating, Semi-Gloss Texture, White
252	Umbra Gray (RAL7022)	Tiger Drylac 49/72850 – Interior/Exterior, Weather Resistant TGIC Polyester Powder Coating, Color Umbra Gray (RAL 7022)
253	Satuary Bronze	DuPont Alesta PFJ407A5 TGIC Polyester Powder Coat
254	Anti-graffiti Clear Coat	Sherwin-Williams Powdura UCS9-00007
255	Anti-graffiti White	Tiger Drylac 44/10008
256	Aluminum, Fed Std #17178	Aluminum Finish, Federal Standard 595C #17178, approved suppliers: PPG, DuPont, Sherwin-Williams
257	Dark Green, Fed Std 14036	Sherwin Williams PGS5-00505
258	Super OGF Black	IFS Coatings SRSS 10004 TGIC Polyester Powder Coat, Super Out Gas Forgiving (OGF)
259	Olive Brown, RAL 8008	Tiger Drylac 49/66110 or 38/60008 Powder Coat



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Code	Description	Approved Powder Coat
260	Patrician Bronze 1452	Vitracoat PDL50011-1 Polyester Powder Coat
261	Midnight Neutral	Cardinal # X009-BKN01767 Powder Coat
262	Black, Fed Std 27038	Cardinal / Tiger Drylac / Sherwin Williams Polyester powder coat matching Federal Standard 595B Color 27038
263	Green	Protec PSG111G162 Sherwin Williams DGS8-70031-C50
264	Dark Brown, Fed Std 20040	Cardinal / Tiger Drylac / Sherwin Williams Polyester powder coat matching Federal Standard 595B Color 20040 Protech ZS341M321
265	Luster Gray, RAL 7042	Tiger Drylac 49/73250 or 38/70042
266	Dove Gray, PU96104	Spraylat Polyurethanes PU96104
267	Dark Hemlock Green	TCI 9010-62306
268	RAL 6012 Black Green	Tiger Drylac 38/50012 or 49/51540 TCI 9840-61262R
269	RAL 7040 Window Grey	TCI 9840-71979R, Polyester TGIC Powder Coating, 80-89 Gloss Smooth
270	Gloss Smooth Beige	Cardinal T009-BG16, Polyester TGIC Powder Coating, Full Gloss Smooth
271	Gloss White, Powder Coat	Protech PS111W2 Gloss White Polyester (UL Recognized)



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Code	Description	Approved Powder Coat
272	Comet Black U1578-1, Powder Coat	AkzoNobel, Interpon 600, JN103QF (Formerly 30-7018), Comet Black U1578-1, Polyester TGIC Powder Coating
273	Clear, Anti-graffiti, Smooth Glossy	Tiger Drylac 44/00018

* Some clarification may be required for these codes, please contact ATL's Design Services team when specifying these codes.

3.0 Legacy Information:

Alpha and Argus legacy finishes may be identified on a drawing that references a different document number than this one. In those cases, please refer to the following legacy finish tables:

- Part drawings that refer to "Alpha Document 070-022-00" (which is included in the ATL Supplier Production Standards package) contain Altair-specific code information which should be confirmed with ATL prior to proceeding to avoid any confusion or conflict.
- Part drawings that refer to "Argus Document 070-024-83" (which is included in the ATL Supplier Production Standards package) contain legacy code information, which should be confirmed with ATL prior to proceeding.

END OF DOCUMENT

For assistance, contact Alpha Technical Support:
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Monday - Friday, 7:00 AM - 5:00 PM PST for regular inquires
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