

# Cosmetic Inspection Guidelines for Uncoated Aluminum Cabinets

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## Cosmetic Inspection Guidelines for Uncoated Aluminum Cabinets

### 1.0 Purpose / Scope

The purpose of this document is to provide the necessary guidelines and acceptance limits for the visual appearance of Feeder Panel Cabinets with Aluminum Mill finish (GE P/N ENCL-00319) or for other unfinished aluminum cabinets. The scope includes all surfaces (front, sides, top, bottom, plates, panels, and doors).

Unfinished Aluminum cabinets require extra care since anomalies cannot be buffed out and the surface finish is not covered with paint. In addition, aluminum is easily scuffed and scratched with typical fabrication methods and improper handling.

This document will be used by both the supplier and GE Energy Connections to determine if cabinets are acceptable for shipment and use.

### 1.1 Responsible Roles

- Suppliers will deliver the cabinets as defined and specified in this document
- GE Sourcing/Supplier Quality organization are responsible for communicating the requirements to the supplier
- GE Project Support Engineer will provide clarification with respect to interpretation of the standard.

### 1.2 Compliance Date

- Full compliance from all parties after agreement from representatives of both the supplier and GE.
- Any specification exceptions to references in this document by the supplier must be submitted by the supplier on a SDR in Clear Orbit and approved by the appropriate GE representative and documented accordingly.



## Cosmetic Inspection Guidelines for Uncoated Aluminum Cabinets

### 2.0 Visual Inspection Process

#### 2.1 Viewing Position

All surfaces should be viewed as close to “normal viewing position” as practical. That is, look at the part as you would see it as a complete unit installed in the customer site. It is not necessary to rotate the part to allow light to reflect at all possible angles of the cabinet, since the cabinet will remain stationary once the unit is assembled.

#### 2.1 Viewing Distance

The cabinet should be inspected at “arm’s length”, which is roughly 30”. This is the distance where the customer views the cabinet. Imperfections, which cannot be seen from this distance, are acceptable.

#### 2.2 Viewing Time

Any one surface should not be inspected for more than 10 seconds. This “once over” glance is sufficient to notice any imperfections that are readily apparent. Imperfections that take over 10 seconds to notice are not generally the type that would result in customer dissatisfaction.

#### 2.3 Viewing Zones

The following zones have been established and proven effective and are listed here only to maintain continuity.

**“A” zone:** All areas that include the primary appearance and interface area, as the customer views or interacts with the Cabinet. Refer to the following sketches, which identifies this area. This is the area that is most visible to the customer.

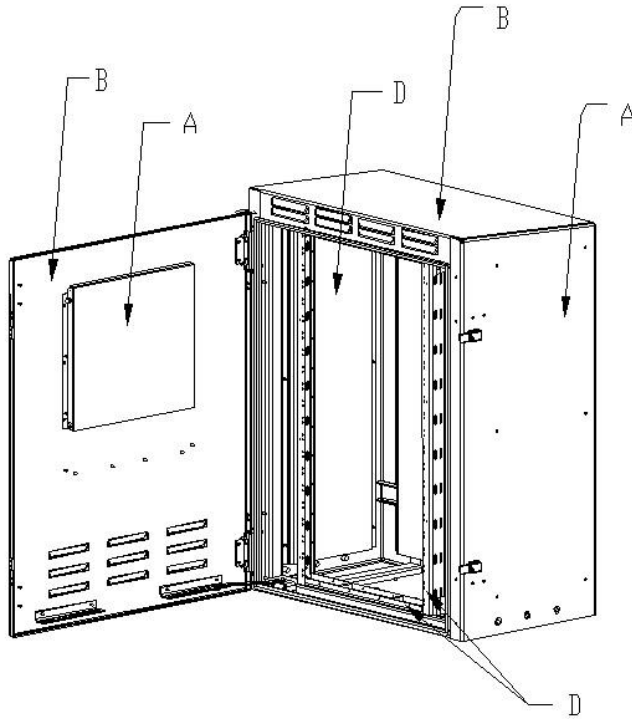
**“B” zone:** Areas adjacent to “A” zone, but not readily visible in normal open and close positions.

**“C” zone:** Areas that are visible only when special effort must be made to see a sizable defect.

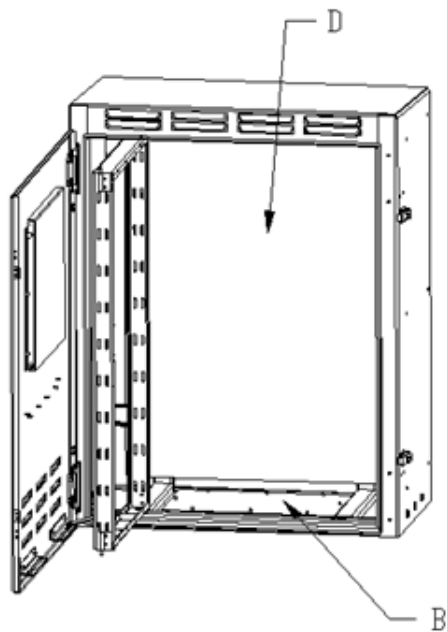
**“D” zone:** All areas that are not exposed once the unit is populated.



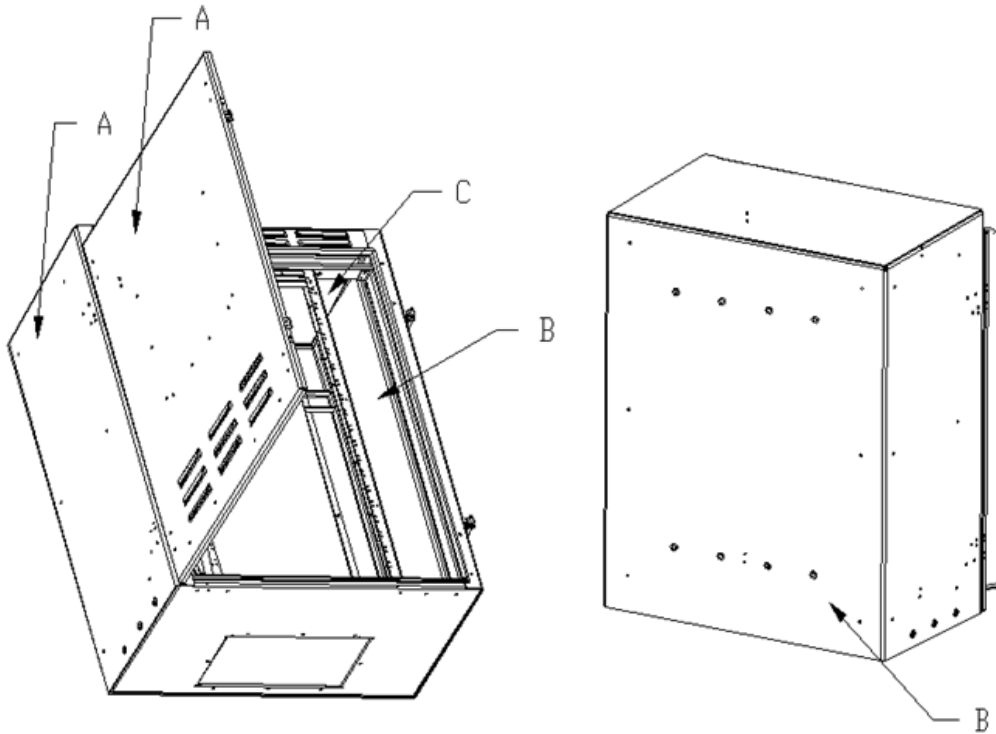
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### 2.4 Criteria for Anomalies and Defects



Uncontrolled when Printed  
or  
Transmitted Electronically

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Defect	Area	Max Size Allowed	Number Allowed	Proximity
Scuff, Light Scratch, or Rub Mark	A	1.5" Long	1	N/A
	B	1.5" Long	2	6"
	C	Acceptable	Any	Any
	D	Acceptable	Any	Any
	<b>Note: Must not catch fingernail</b>			
Scratch (catches fingernail)	A	0.25" Long	1	N/A
	B	1.0" Long	2	6"
	C	1.0" Long	2	6"
	D	Acceptable	Any	Any
	<b>Note: No sharp burr allowed</b>			
Gouge	A	None	N/A	N/A
	B	0.030"x0.060"	2	12"
	C	0.075"x0.250"	2	6"
	D	Acceptable	Any	Any
	<b>Note: No sharp burr allowed</b>			
Pit	A	0.030"	3	6"
	B	0.030"	6	6"
	C	0.045"	6	6"
	D	Acceptable	Any	Any
	Slug Mark (Foreign Material)	A	None	N/A
B		0.060"x0.120"	1	N/A
C		0.060"x0.120"	3	6"
D		Acceptable	Any	Any
Die Mark (distance from edge of hardware)		A	0.50"	N/A
	B	0.75"	N/A	N/A
	C	0.75"	N/A	N/A
	D	Acceptable	Any	Any
	Dent	A	None	N/A
B		0.25" radius	1	N/A
C		0.50" radius	1	N/A
D		Acceptable	Any	Any
Weld Mark		A	None allowed	N/A



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showing burn or black	B	None allowed	N/A	N/A
	C	Within 0.25" of weld	Any	Any
	D	Acceptable	Any	Any
Bend Line (Edge Area)	A	1" from edge allowed but minimize*	Minimize*	Any*
	B	1" from edge allowed entire length	Any	Any
	C	Acceptable	Any	Any
	D	Acceptable	Any	Any

\* Supplier to use Tuff Brake Film or other cushioning to minimize possibility of Tooling making bend line impressions, especially in A-Zones

- Definition of "N/A" in table above: Not Applicable
- Definition of "Any" in table above: Any number of anomalies is allowed and the proximity has no limits.

### 2.4.1 Discoloration, Stains, Spots, Streaks, and Roller Marks

Industry Standard Mill Finish will apply. See Definition Section 3.1 for an explanation of Standard Mill Finish.

## 2.5 Escalation Process

If there are questions regarding a defect that may not fall under the acceptance criteria contact the GE Energy Connections Supplier Quality representative for further clarification.

## 2.6 Special Handling Requirements during inspection and transport of material

- The aluminum material can be marked by contact with shirt buttons, badges, jewelry, lanyards, zippers, and pens. These items should be removed, restrained, or covered during inspection and handling.
- Clean gloves should be worn during inspection and handling. Skin oils and hand creams can discolor the metal.
- At no point shall shrink wrap be used on the cabinets.
- Steel straps shall not be used to strap cabinets against pallets; Use Plastic straps.
- Foam sheeting must be used between the cabinets and any other packing materials.





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### 2.7 Qualifying aluminum sheet stock incoming to supplier

Aluminum sheet stock arrives from the distributor covered with protective film. The suggested incoming inspection plan is for two aluminum sheets or sample coupons of 12"X12" minimum size be sampled at the supplier's incoming inspection by peeling back the film and inspecting the finish to insure it meets the requirements defined in this specification. This practice is recommended for every shipment, even if it is the same lot as the previous shipment. The viewing angle of the inspection should be done both parallel and perpendicular to the grain. Supplier requested to maintain traceability with purchase orders or by batch number from the distributor.

## 3.0 Definitions, Acronyms and References

### 3.1 Definitions

- Bend Line: a mark made by the tooling die when bending the metal to create an edge. Bend lines are parallel to the edge bent.
- Die Mark: a mark made by a tooling die when pressing or inserting hardware. The Die Mark will be at a defined boundary from the hardware.
- Gouge: point source impact made unintentionally by a hard object, such as impact by a metal object that contacts in one area without skidding.
- Pit: a defect in the material itself. Pits are not caused by mechanical damage.
- Standard Mill Finish: ASTM- B209 defines Standard Mill Finish as, "Sheet having a non-uniform finish which may vary from sheet to sheet and within a sheet, and may not be entirely free from stains or oil."

Federal Specification QQ-A-250F defines Mill Finish Workmanship as follows:  
"The plate and sheet shall be uniform in quality and condition; clean, sound, smooth, commercially flat, and free from buckles, blisters, and other injurious defects within the limits consistent with the best commercial practice. Discoloration due to thermal treatment shall not be cause for rejection.

- Clear Orbit: The GE Energy Connections web based tool that contains supplier interfacing modules. Supplier Deviation Request and Supplier Corrective Action Request are two such modules.



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- Supplier Deviation Request (SDR): A request initiated by the supplier to deviate from purchase order technical requirements (drawings, specifications, engineering instructions, etc.) or the approved qualification package.

### 3.2 Supporting Documents

The specifications identified in the preceding paragraphs may not be applicable to all GE Energy Connection businesses. Confirmation with the SQE is required for applicability. These include but are not limited to:

- EM-SRC-0002 Supplier Quality Requirements
- EM-SRC-0004 Visual Inspection Requirements for Weldments
- EM-SRC-0005 General Requirements – Marking, Preservation, Packaging and Shipping

These supporting documents can all be found at the GE Energy Connections Supplier Central site, under the Supplier Quality Icon (see link below):

<http://www.geenergyconnections.com/supplier-quality>



## Cosmetic Inspection Guidelines for Uncoated Aluminum Cabinets

### 4.0 Document Revisions and Approvals

The following chart lists the revisions made to this document tracked by version. Use this to describe the changes and additions each time this document is re-published. The description should include as many details of the changes as possible.

Records of Reviewers and Approvers may be found within the DMS (Document Management System).

Version	Section Modified and Revision Description	Date	Author
1.0	New Issue	05/03/2016	Tim Milliman

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