

NOMMA Voluntary Joint Finishes

Understanding Weld Finish Standards and Cost Implications in Architectural Metal Railings.

Executive Summary

Weld finish quality plays a critical role in the performance, aesthetics, and cost of architectural railing systems. The NOMMA (National Ornamental & Miscellaneous Metals Association) Voluntary Joint Finish Standards provide a widely recognized framework for defining weld appearance in metal fabrication. However, specifying higher finish levels—particularly NOMMA #1—can significantly increase fabrication costs due to the labor-intensive processes required.

This paper outlines the NOMMA finish classifications, compares them to Tuttle A Dant Clayton Division internal standards, and highlights the real cost impacts associated with each level. It is intended to guide architects, engineers, and owners toward more informed specification decisions that balance aesthetics with budget and constructability.

1. Introduction

In architectural decorative railing systems- weld appearance is often scrutinized as closely as overall system design. While structural integrity is paramount, visual quality can drive specification decisions, particularly in high-profile environments such as stadiums, arenas, and commercial buildings.

The NOMMA Voluntary Joint Finish Standards were developed to establish consistent expectations between designers and fabricators. However, these standards are frequently misunderstood or over-specified, leading to unnecessary cost escalation.

2. NOMMA Weld Finish Classifications

The NOMMA system defines four primary levels of weld finishing, based on the degree of grinding, sanding, and visual refinement:



NOMMA #1 – Fully Blended

- Weld completely sanded and blended
- Joint is visually indistinguishable from surrounding material
- Highest aesthetic quality



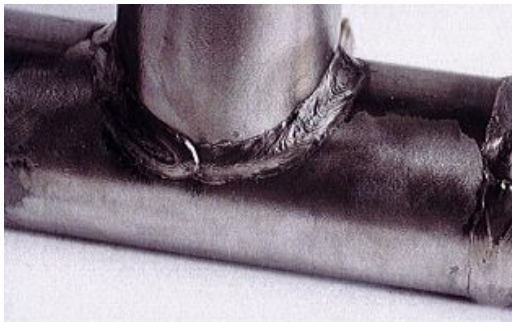
NOMMA #2 – Sanded Joint

- Weld sanded smooth
- Minor imperfections such as pinholes or slight undercutting acceptable



NOMMA #3 – Partially Dressed Weld

- Weld partially ground
- Spatter removed
- Weld bead still visible






NOMMA #4 – Undressed Weld

- Uniform, good-quality weld
- Minimal cleanup
- Most economical option

(All samples are pictured in unpainted steel NOMMA Guide 2.1)

3. Tuttle Weld Standards Alignment

Tuttle (a Dant Clayton Division) aligns its internal weld standards with NOMMA classifications, particularly for aluminum railing systems with anodized finishes:

	Tuttle Standard	Description	NOMMA Equivalent
	Standard A	Fully sanded and blended. <i>Even with fully sanded and blended joint the weld is visible after anodize.</i>	NOMMA #1
	Standard B	Re-flowed smooth weld.	NOMMA #2-#3
	Standard C	Undressed bead weld.	NOMMA #3-#4

(All Tuttle samples above are pictured with AA M10 C22 A41 Clear anodized finish).



Example of Tuttle Weld Standard A - Sanded and blended completely (Equivalent to NOMMA #1) prior to anodize.

Moving up the NOMMA levels increases cost disproportionately, not evenly:

- Finish #4 → #3: small cost increase (basic cleanup)
- #3 → #2: moderate increase (full sanding, consistency work)
- #2 → #1: major jump (blend-to-invisible, skilled labor)

In Aluminum railings this often means:

- 2-4× more labor hours per joint going from #3 → #1
- Slower throughput, reduced shop efficiency

4. The Cost Impact of Weld Finish Selection

One of the most overlooked aspects of specifying weld finishes is the non-linear cost increase associated with higher levels of refinement.

Cost Escalation by Finish Level

- NOMMA #4 → #3: Minimal cost increase (basic cleanup)
- #3 → #2: Moderate increase (sanding and consistency)
- #2 → #1: Significant cost increase (full blending to invisible)

Why Costs Increase

Higher finish levels are driven almost entirely by manual labor, including:

- Multiple grinding passes
- Progressive sanding (multiple grit levels)
- Hand blending and polishing
- Rework to remove defects (porosity, undercut, mismatch)

In aluminum railing systems, moving from NOMMA #3 to #1 can require:

- 2–4× more labor hours per joint
- Reduced fabrication throughput
- Lower shop efficiency

5. Material Considerations: Aluminum vs Steel

While NOMMA standards are demonstrated using steel, aluminum behaves differently- especially under anodized finishes:

- Aluminum highlights imperfections more than painted steel
- Blended finishes require greater precision prior to anodizing
- Rework after anodizing is not possible

This makes early specification alignment even more critical in aluminum systems.

6. Specification Best Practices

To balance cost and performance, consider the following:

1. Match Finish Level to Visibility

- High visibility areas: NOMMA #1 or #2
- Low visibility/service areas: NOMMA #3 or #4

2. Avoid Over-Specification

- Do not default to NOMMA #1 unless required
- Evaluate whether “invisible welds” are truly necessary

3. Coordinate Finish with Coating

- Anodized systems require tighter weld control
- Painted systems can mask minor imperfections

4. Engage Fabricator Early

- Review mockups or samples
- Align expectations before production

7. Applications in Stadiums and Large Venues

In sports and large-scale venues, railing systems must balance:

Cost Escalation by Finish Level

- High durability
- Fast installation schedules
- Budget constraints
- Aesthetic expectations in premium areas

A tiered approach optimizes both cost and visual impact.

8. Conclusion

NOMMA weld finish standards provide a valuable framework for defining expectations in metal fabrication. However, the cost implications- especially at higher finish levels- are often underestimated.

By understanding the relationship between finish level, labor intensity, and material behavior, project teams can make smarter specification decisions that deliver the desired aesthetic without unnecessary cost escalation.

9. For optimal results

- Align weld finish standards early in design
- Request finish samples and mockups
- Collaborate with experienced fabricators
- This ensures the final product meets both design intent and budget realities.



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