



**MANUFACTURER OF ALUMINUM RAILING SYSTEMS**

ATR TECHNOLOGIES, INC. is the manufacturer of Aluminum Tube Railings. For over 45 years, the construction industry has been served by this product. Aluminum Tube Railings utilize non-welded, inter-locking and tamper-free connections to produce long lasting and virtually maintenance free aluminum railing systems including balcony guardrails, ramp handrails, stair railings and grip rails. Styles include picket railings, glass panel railings, multiple line railings and pipe railings. Aluminum Tube Railings have been installed on thousands of projects worldwide, including hotels and condominiums (high rise and low-rise), apartment buildings, water treatment plants, beachfront buildings, boardwalks, and many other custom installations. Additional information is available upon request.



Aluminum railings qualify for LEED Credit under "Materials & Resources - Recycled Content."

The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™ is a nationally accepted benchmark for the design, construction, and operations of high performance green buildings.



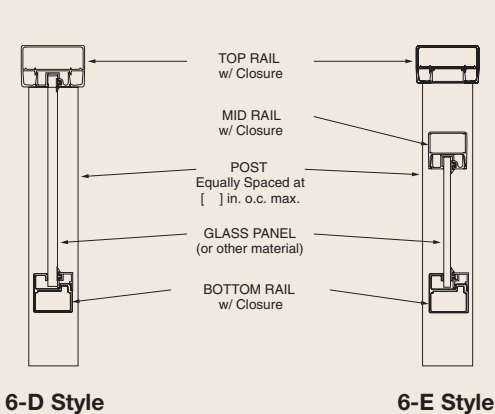
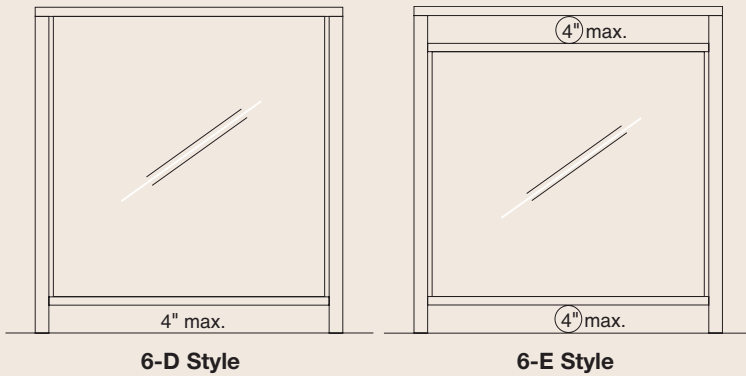
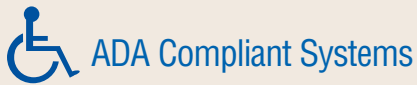
ADA Compliant Systems

# GLASS PANEL RAIL

The demand for Aluminum Framed Glass Panel Rail has increased due to the popularity of buildings with views from their balconies and decks. Current building codes require 4-inch maximum openings within the railing system, which may obstruct picturesque views. Depending on the type of panel material selected, effects range from an unobscured view to total privacy.

The aluminum frame for the panel guardrail is created from a variety of components that can be interchanged to produce various guardrail designs. If needed, custom components can be developed to meet almost any need.

By far the most common panel material used in our Panel Rail system is tempered glass. This glass infill panel can be clear to allow an unobstructed view or tinted to accent the building. For privacy, translucent to opaque panel materials are available. Panel thickness is from 1/4-inch minimum to 3/8-inch maximum.



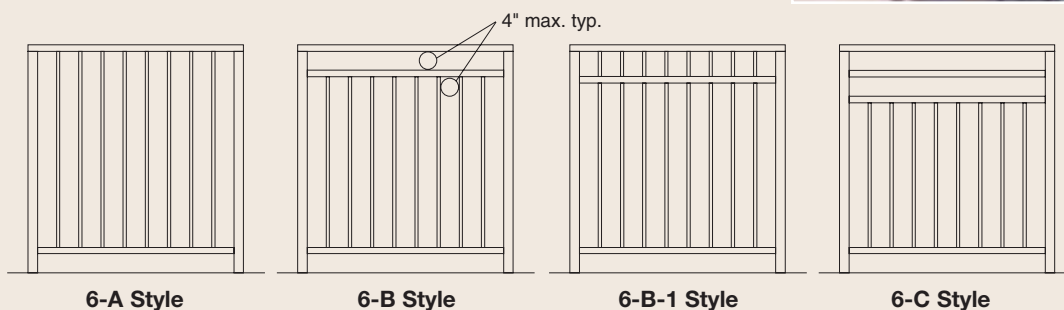
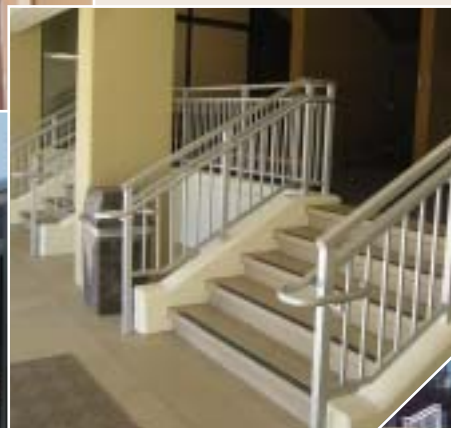
Please refer to pages 6 and 7 for allowable post spacing, components and mounting/connection details.

# PICKET RAIL

The Balustrade (or Picket) Guardrail is a traditional, time honored railing system that was developed and engineered to meet the demands of architects and designers. Balustrade guardrail is our oldest style railing system and offers a safe, cost effective and efficient system for balconies and stairs.

ATR Technologies' Picket Guardrail System is made from various interchangeable components. New and custom components are constantly being developed to meet the ever-changing architectural community's needs. All of these components are then combined to produce hundreds of different aesthetically pleasing railing systems to meet almost any design criteria. If the existing components cannot provide the desired appearance, custom components can be developed as required.

 ADA Compliant Systems



Please visit our website at [www.atr-technologies.com](http://www.atr-technologies.com) for downloadable CAD details and architectural specifications

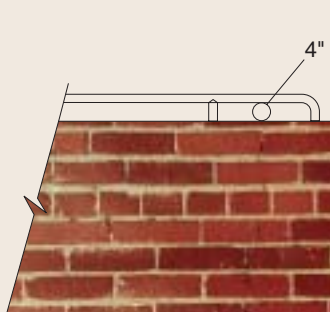
# MULTI-LINE/PIPE RAIL

Our Multi-Line Rail system utilizes a variety of interchangeable aluminum parts to allow the creation of many different architectural designs. For those seeking an alternative to traditional pipe railing systems, this system allows round or oval components to be combined with square or rectangular shapes to create a variety of styles. New extrusion dies can be developed as required to facilitate new architectural concepts.

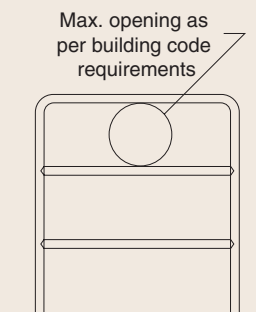
Another Multi-Line Rail system that has become quite popular is ATR Technologies' Cable Rail system. Our Cable Rail System offers flexibility for the designer to use any of our top rails, posts and, if required, bottom rails along with stainless steel cables for the infill area. Post spacing, cable size and cable spacing is varied to meet project and local building code requirements. In addition, due to the flexibility of our railing systems, stainless steel cables can be combined with our picket or glass panel style guardrails for a truly unique design. Please contact ATR Technologies for more information.

Standard pipe rail systems are commonly found on industrial applications as well as many modern architectural applications. The ATR Technologies' aluminum Pipe Rail system allows for flexible designs utilizing in-line style, flush fittings and bent transitions.

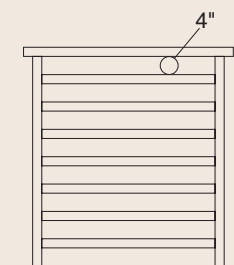
## ADA Compliant Systems



**6-K Style  
Parapet Rail**



**6-M Style  
3-Line Rail**



**6-S Style  
Multi-Line Rail**



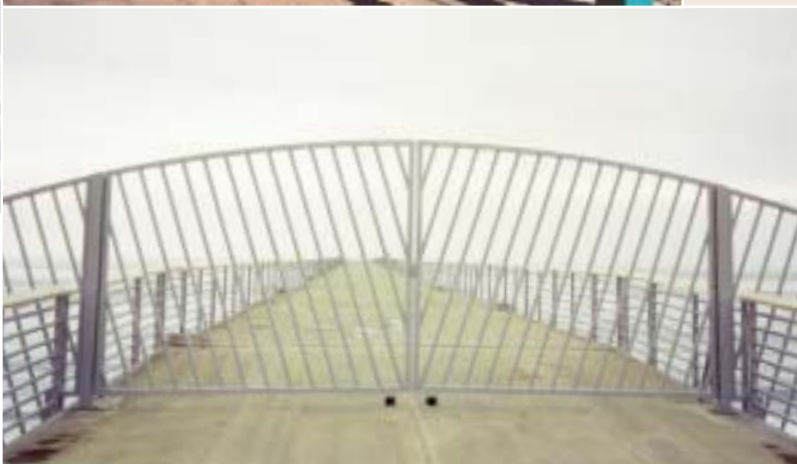
Please refer to pages 6 and 7 for allowable post spacing, components and mounting connection details.

## CUSTOM DESIGNS

As new concepts develop and value engineering permits, ATR Technologies has generated over 300 custom dies and the associated tooling in order to meet architectural design requirements for an ever-changing market. Custom aluminum railing systems are often done by reducing costs and maintaining the designer's general aesthetics. Many current extrusion shapes were created by ATR Technologies to meet past architectural design requests. Please feel free to forward your new design concepts for a feasibility review.

### CUSTOM ALUMINUM TUBE RAILINGS

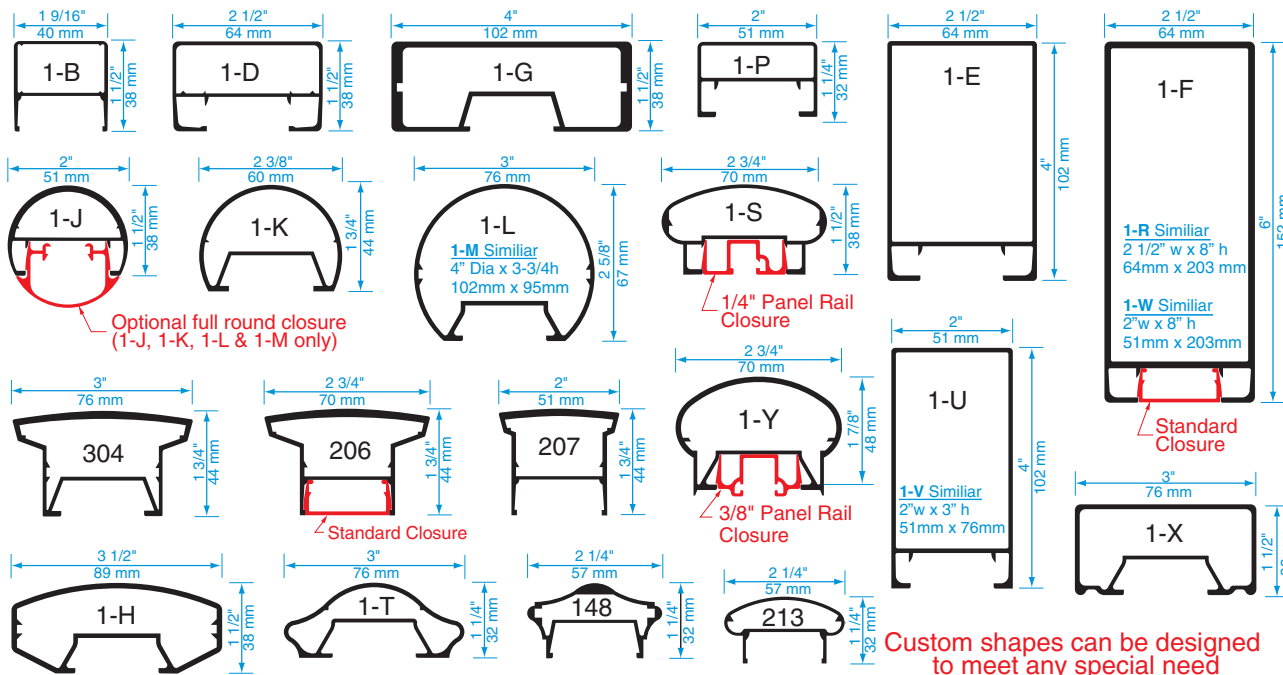
ATR Technologies offers various styles of custom railing systems with proven quality and competitive prices. All Aluminum Tube Railings feature interlocking technology, concealed fasteners, and tamper resistant construction. When required, welded construction can be incorporated into the overall design. ATR Technologies has the experience, background, and skilled craftsmen needed to respond with accurate and effective solutions.



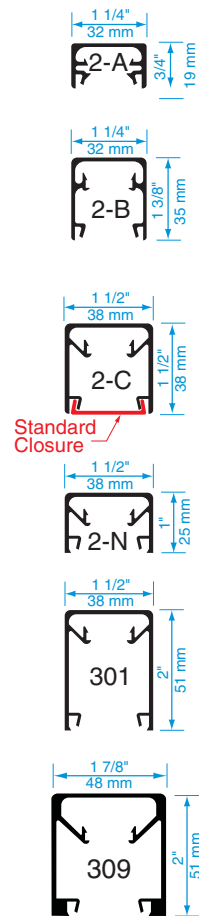
Please visit our website at [www.atr-technologies.com](http://www.atr-technologies.com) for downloadable CAD details and architectural specifications

# Components/Shapes

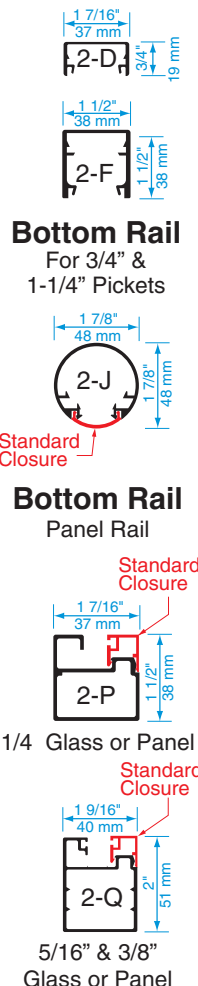
## Top Rails



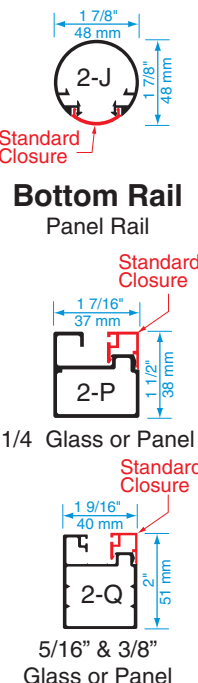
### Bottom Rails For 3/4" Pickets



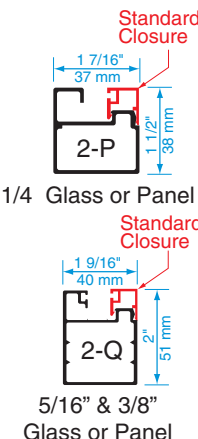
### Bottom Rails For 1-1/4" Pickets



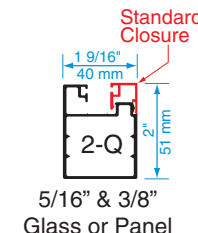
### Bottom Rail For 3/4" & 1-1/4" Pickets



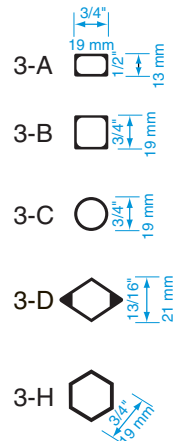
### Bottom Rail Panel Rail



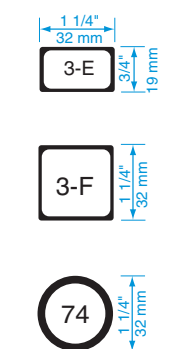
### 1/4 Glass or Panel 5/16" & 3/8" Glass or Panel



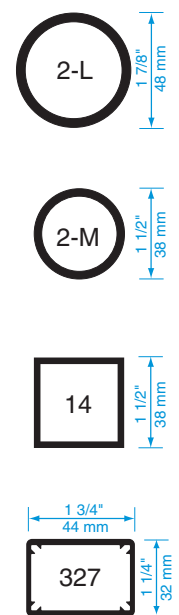
### Pickets For 3/4" System



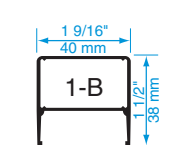
### Pickets For 1-1/4" System



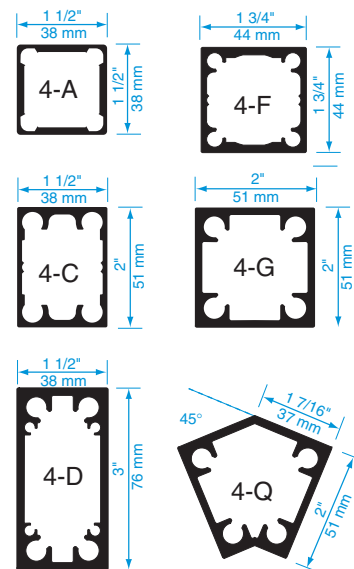
### Handrails & Midrails



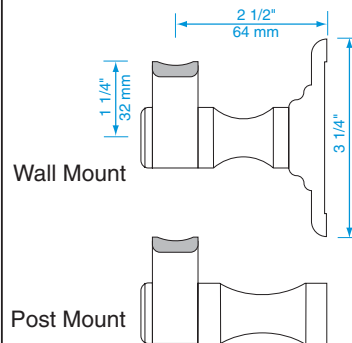
### Midrails (For use with pickets)



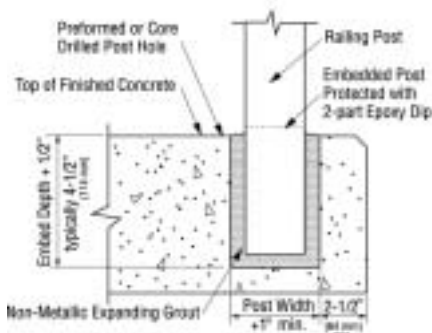
### Posts



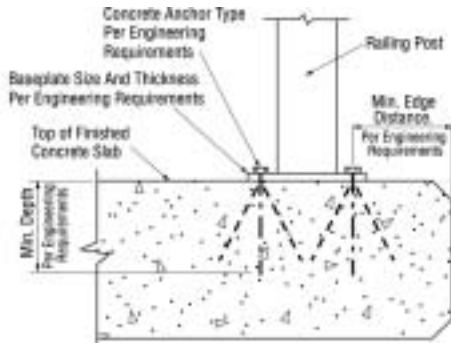
### Handrail Brackets



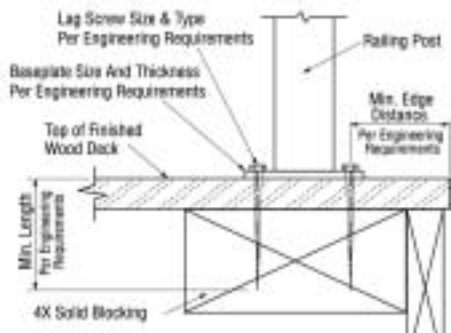
# Mounting and Connection Details



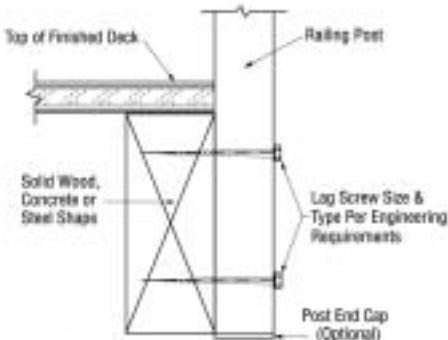
**5-A MOUNT (Embedded Post)**



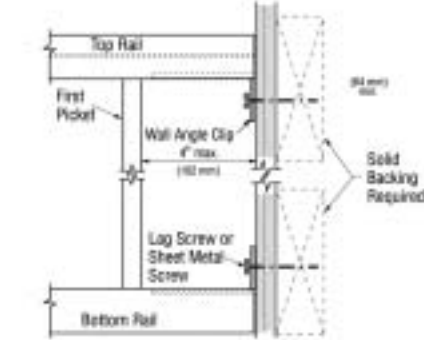
**5-B MOUNT (Baseplate to Concrete)**



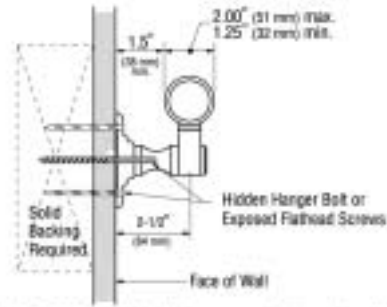
**5-B MOUNT (Baseplate to Wood)**



**5-C (Side Mount Wood or Concrete)**



**5-H MOUNT (Wall Attachment)**



**5-K MOUNT (Wall Mounted Handrail)**

This chart is provided as a basic guideline for proper post spacing. However, there may be additional project specific factors that need to be considered. Some of these other factors might include: Point Loads, Wind Loads, Deflection Limits, In-fill Panel Loads, Handrail / ADA Loads, Vertical Loads, and Mounting Conditions. Therefore, please contact ATR Technologies, Inc. for a more complete evaluation of each project.

## Estimated Allowable Post Spacing in Inches (1) (2) (3) (4)

Part Number	Rail Height	20 Pounds Per foot @ top rail	50 Pounds Per foot @ top rail	Typ. Wind Load [Approx. 30 PSF] (Glass Rail Only)	200 Pound Concentrated Load (6)
2-M (7)	36" High	47	19	N/A	Not Recommended
2-L (7)	36" High	90	36	N/A	Acceptable
4-A	42" High	51	20	27	Not Recommended
4-C	42" High	102	41	54	Acceptable
4-F	42" High	120	48	63	Acceptable
4-G	42" High	193	77	101	Acceptable
4-G w/insert	42" High	245	98	129	Acceptable

- (1) Spacings based on Allowable Stress Design per the 1997 UBC for strength only. The chart does not consider other factors such as ADA loads, combined loads, load sharing, deflection, or limitations from other components such as the pickets, glass, mid-rails, bottom rails or anchoring system. Please contact ATR for a more complete evaluation of each project.
- (2) Allowable stress increase factor of 1.30 for shapes bent in their weak axis, where applicable, is not included.
- (3) Spacing information is provided as a general design guide only.

- (4) Spacings beyond 80 inches are normally not practical due to deflections.
- (5) Not all loads apply to each application the user must decide on the appropriate column(s) to use.
- (6) Assume 40% load sharing with adjacent post due to a stiff top rail distributing loads
- (7) When the round handrail is also used as the vertical structural post

# FINISHES

## Coatings, Surfacing

There are three basic categories for aluminum finishes:  
**ANODIC FINISH, BAKED ENAMEL FINISH** and **POWDER COAT FINISH**.  
Each are available and are briefly described below:

Aluminum Tube Railings by ATR Technologies, Inc. are available in a variety of finishes and colors. These options are listed and described below.

### Anodize Finishes

#### **ARCHITECTURAL CLASS I ANODIZE**

This process creates a film of aluminum oxide on the surfaces of aluminum extrusions with a minimum coating thickness of 0.7 mil. This hard and durable finish resists abrasion and corrosion. It is especially well suited for heavy abuse environments. It is used for exterior and interior applications with a life expectancy of over 30 years depending on environmental conditions. Architectural Class I Anodize finishes are available in the following colors:

CLEAR	(AA-M12 C22 A41)
GOLD	(AA-M12 C22 A43)
LIGHT BRONZE	(AA-M12 C22 A44)
MEDIUM BRONZE	(AA-M12 C22 A44)
DARK BRONZE	(AA-M12 C22 A44)
BLACK	(AA-M12 C22 A44)
HARD COAT	(MIL-A-8625, Type III, Class I)

#### **MECHANICAL PRETREATMENTS**

All Anodized finishes may be applied over pretreated aluminum extrusions. When used, the pretreatment number replaces the "M12" in the AA designation. The most commonly used pretreatments are: M32-Medium Directional Texture and M21- Smooth Polished.

#### **GENERAL ANODIZE NOTES**

Anodize is best used on 6063 or 6005 series aluminum alloys. Aluminum oxide coatings are known to have a hardness similar to that of a diamond. Since welding aluminum changes temper slightly, exposed welded joints may halo or appear slightly discolored under the anodized finish.

### Baked Enamel Finishes

This coating process offers virtually unlimited colors and a wide variety of quality.

**Superior Performance:** Kynar 500®, Hylar 5000®, Duranar®, or other baked enamel products that contain 70% polyvinylidene fluoride (PVDF) resin. These products meet the performance criteria of the AAMA 2605 specification. Such finishes have 30-year life expectancy on aluminum depending on environment.

#### **GENERAL BAKED ENAMEL NOTES**

Baked Enamels are factory-applied, oven-baked finishes that are available in virtually any color. Prices may vary depending on the color choice. Generally, colors are divided into standard, custom and exotic colors. Custom colors are available and priced accordingly. Exotic colors are generally considered bright, metallic or "XL"

and therefore, may require a clear topcoat. Color matching is available. Color chips are prepared by the applicators laboratory for approval.

### Powder Coat Finishes

This coating process offers hundreds of industry standardized "RAL" colors in many quality options:

**High Performance Powder:** Tiger Drylac, Spraylat, Akzo Nobel and others provide a variety of powder coating options. High Performance Powder Coatings meet the performance criteria of the AAMA 2604 up to 2605 specification.

#### **GENERAL POWDER COATING NOTES**

Prices vary depending on the color selection. Generally, colors are divided into standard, custom and exotic colors. Many custom colors are matched first to the closest existing "RAL" color available. Feasibility to create custom and/or exotic colors is subject to the product manufacturer's ability and priced accordingly. Color chips are provided from the applicator.

## Uses, Applications

Aluminum Tube Railing systems are ideally suited for virtually maintenance free requirements such as decks and balconies. Railing systems over 4'-0" (1.21 Meters) high also produce virtually maintenance free fencing for pool areas and site perimeters. Other ornamental applications include Juliette (or false balcony rails, trellis structures, fretwork, and chair rails.

## Assembly, Installation

Aluminum Tube Railing systems are easily installed, requiring virtually no assembly on the jobsite. Railing sections are shipped pre-assembled in lengths up to 20'-0" (6.09 Meters) long. Field assembly of Aluminum Tube Railing sections is accomplished by joining together the prefabricated sections and setting them into place. Shop drawings are provided for each awarded contract. Additional instructions are provided upon request. Installation by ATR Technologies, Inc. is available depending on project magnitude, location and requirements.

## Materials, Finishes

Aluminum Tube Railings are produced from 6063-T6 & 6005-T5 aluminum alloys. A variety of finishes are available including several grades of baked enamel, powder coat and anodize. All mechanical connections use interlocking technology which is hidden from view or use internal fasteners of aluminum, cadmium

plated or stainless steel. Typical designs utilize non-welded joints. These mechanically connected joints avoid welded construction and also avoid the "halos" or discolored areas commonly seen with anodized finishes on welded joints. When required, welded construction is utilized.

## Technical Support

ATR Technologies, Inc. provides design and cost estimates, installation, shop drawings, engineering calculations, custom extrusions and additional support for any project as required.

## Workmanship and Installation

Aluminum Tube Railings shall be fabricated according to approved shop drawings and actual field dimensions. All materials shall be installed plumb, square, and level and shall be anchored securely in proper alignment with adjacent work. Posts shall be anchored according to approved shop drawings. Adequate provisions shall be made for thermal expansion and contraction of all exterior railings. All miters and field cuts shall be smoothed after joining. When aluminum is placed in contact with dissimilar materials, the aluminum surface shall be protected by a vinyl tape or epoxy paint barrier.

## Final Acceptance

The railing subcontractor shall complete the railings for final inspection and acceptance as installed according to the contract requirements. The General Contractor shall be responsible for

protecting the installed railings from subsequent operations of other trades during the balance of construction.

## Cleaning

Aluminum Tube Railings shall be cleaned with plain water containing a mild soap or detergent or distillate. No abrasive agent shall be used.

## Codes, Certification

Engineering calculations are provided as required. When specified, certified engineering is provided by a California State Certified engineer for each project awarded. Aluminum Tube Railings by ATR Technologies, Inc. meet and exceed the loading requirements established by CBC, IBC, OSHA and local Building Codes, including ADA Accessibility Guidelines (ADAAG).

## Operation, Maintenance

Aluminum Tube Railings by ATR Technologies, Inc. are virtually maintenance free. Depending on finish selected, seasonal rains may rinse off dust and debris on exterior installations. When heavier deposits are subject to occur or when periodic maintenance is required, mild detergents and warm water are generally recommended, subject to the applicator's cleaning recommendations. These recommendations vary by finish and location and are available as required.



## ATR TECHNOLOGIES, INCORPORATED

805 Towne Center Drive • Pomona, CA 91767-5901  
California State Contractors License 679259  
909-399-9724 • 909-399-5834 (Fax) • 800-423-4148 (Outside CA)  
www.ATR-Technologies.com • Sales@ATR-Technologies.com (E-Mail)

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