

anodized as follows: follow steps Number 2 and Number 4 above but omit steps Number 1 and 3.

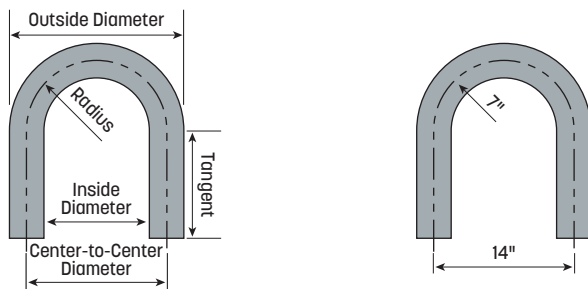
When anodizing cast Aluminum **Brackets** Alloy 214 or Almag 35:

1. 8 minute etch.
2. Up to 12 minutes etch if finish is not clean and smooth.
3. 30 minute anodize 12½ to 13 volts at low voltage.

### Radius vs. Diameter Dimensions

Bend radii and diameters will refer to either the inside or center line of a bend. There is often confusion between radius versus diameter. Note in the diagram below that the diameter is two times the radius. Therefore a 180° bend on a 7" center line radius would yield a 14" center line diameter (14.00" center-to-center). Throughout this catalog *r* is used to refer to inside radius while *R* represents center line radius. The inside radius (*r*) is equal to the center line radius (*R*) less half the OD or width of the **Tubing** being bent.

$$r = R - (OD/2)$$



### Green Building

Green Building initiatives are now being used to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches for residential and commercial construction. The standards presently in use are Green Globes™, the U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED); and the National Association of Home Builders (NAHB) Model Green Home Building Guidelines.

Rating systems award points towards the certification of a building based on the recycled content of materials used as well as their proximity to the project location.

As a general note, all metals are recyclable and are produced using recycled content. Contact **Wagner** for information regarding specific products in this catalog.

Green points are also awarded for providing **Bike Racks** similar to those shown on pages 94 - 97.



Watch our video: *The Wagner Companies - Building a Sustainable Culture*

### Expansion Joints

For continuous spans in excess of 40 feet, expansion joints should be provided. To make an expansion joint, one end of a spliced joint should not be affixed so that it is free to move in or out of the pipe. If a joint is provided every 30 feet, the width of the gap should allow 1/8" expansion for each 40 °F of expected temperature rise. All **Pipe** railing splices should be made no more than 12" from the nearest **Post**.

### Anti-Microbial Properties of Copper Alloys

Stainless Steel has always been the metal of choice in hospital and food service applications. However, recent tests have shown that Copper and its alloys (i.e., Bronze and Brass) have natural anti-microbial and self-decontaminating properties which makes them better suited for use on touch surfaces that are potential reservoirs of infection. Studies have shown that Copper, Brass and Bronze can quickly and efficiently eradicate several different pathogens - including E. coli and MRSA - which are the source of many hospital acquired infections.

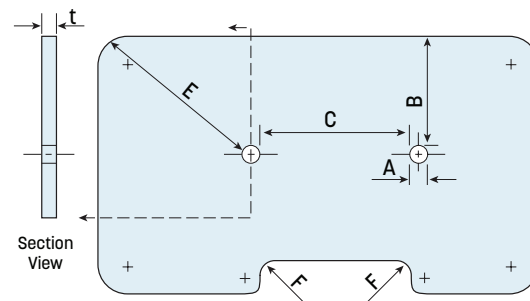
To view more information on this ongoing study, check out the Copper Development Association's website at [copper.org](http://copper.org).

### Holes and Notches in Glass

Per *ASTM C 1048*, this chart should be used to determine minimum sizes and placement for tempered and heat strengthened glass:

|   |        |         |        |        |
|---|--------|---------|--------|--------|
| (t) Glass thickness                             | 1/4"   | 3/8"    | 1/2"   | 3/4"   |
| (A) Minimum diameter of holes                   | 5/16"  | 7/16"   | 9/16"  | 13/16" |
| (B) Distance from edge of hole to edge of glass | 3/8"   | 9/16"   | 3/4"   | 1 1/2" |
| (C) Distance between rims of holes              | 1 5/8" | 2 7/16" | 3 1/4" | 4 7/8" |
| (E) Distance from corner to rim of holes        | 1 5/8" | 2 7/16" | 3 1/4" | 4 7/8" |
| (F) Minimum fillet radius                       | 1/4"   | 3/8"    | 1/2"   | 3/4"   |

All holes and notches must be done prior to tempering. Attempts to drill holes or grind the glass after tempering will most likely result in breakage.



STANDARD PRODUCTS

RAILING SYSTEMS

TRADITIONAL RAILINGS

CUSTOM SERVICES

APPENDIX