Drafting Standards for Aluminum Extruded Products

The Aluminum Association
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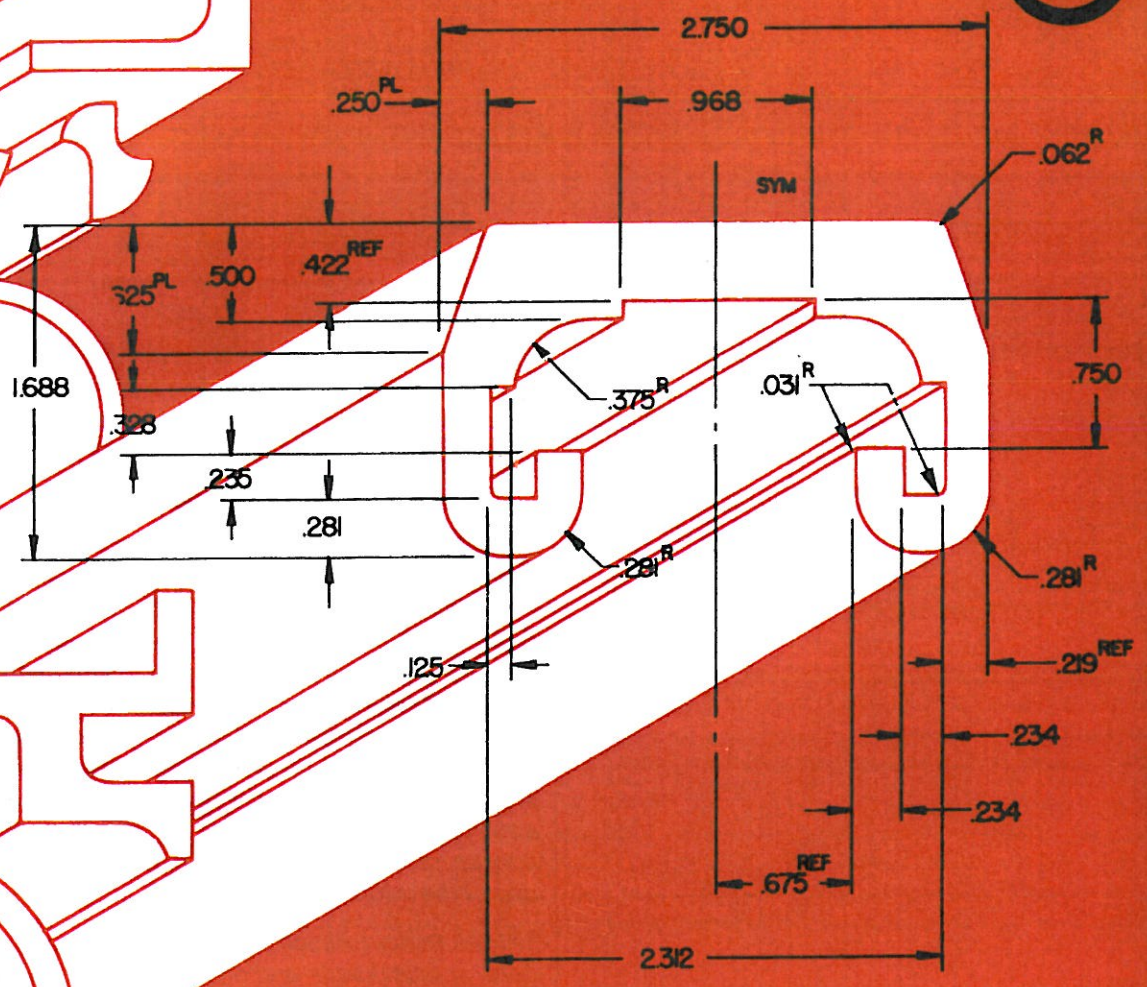

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ABOUT
THE ALUMINUM ASSOCIATION

The member companies of The Aluminum Association, Inc., represent approximately 85 percent of domestic production of primary ingot and shipments of U.S. aluminum mill products. Mill products include sheet and plate; foil; extrusions; electrical conductor and wire, rod and bar. In addition to producers of primary ingot and mill products, the association's membership also includes secondary smelters, foundries and producers of master alloy and additives.

The association is a primary source of statistics, standards, and economic and technical information on aluminum and the aluminum industry in the United States.

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Drafting Standards for Aluminum Extruded Products

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Preface to the Ninth Edition

Because the Standard Drafting Practices published by the American National Standards Institute, American Society of Mechanical Engineers and others, are not entirely suitable to aluminum extruded products, this manual was prepared. Its purpose is to outline certain basic practices that are necessary with extruded products and to standardize those practices insofar as practical. Changes in production and application methods, however, require occasional revision to keep the manual fully abreast to those advances. In addition, experience gained in the use of the manual has indicated some revisions that would make it still more useful. The principal changes from the previous issue were the removal of the trigometric tables, mathematical tables and formulas, and the addition of CAD (Computer Aided Design) and GDT (Geometric Dimensioning and Tolerancing) information. In this issue the tolerance tables were revised to reflect the tolerances in the current issue of ANSI H35.2, and the tolerances for extruded tube are now covered in separate tables.

Reference index

The standard procedures as outlined herein agree in part with the S.A.E. Aerospace-Automotive Drawing Standards (Society of Automotive Engineers). See list below.

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Section I - Introduction

Because of the constant exchange of Extrusion Profile Drawings between customers and extruders, a uniform method of preparing such drawings will be highly beneficial to both.

Certain basic methods of dimensioning, for example, are important to enable the extruder to maintain reasonable efficiency in the manufacture of extrusion tools and in the inspection of extruded material. Adoption of these dimensioning methods by the customer will help insure that the extruder will obtain a suitable and economical product.

It is hoped, therefore, that extrusion customers will prepare their profile drawings in conformity with the practices suggested herein.

Section II - Definition of Products

extruded profile general: A profile produced by hot extruding that is long in relation to its cross-sectional dimensions and has a cross section other than that of rod, bar or tube.

semihollow extruded profile: An extruded profile any part of whose cross section is a partially enclosed void for which the ratio of the area of the void to the square of the gap width is greater than the value shown in Table I for applicable class and alloy.

class 1 semihollow extruded profile: A semihollow extruded profile of two voids or less in which the area of the voids and surrounding metal thickness is symmetrical about the centerline of the gap. Examples, Figures 1a and 1b.

class 2 semihollow extruded profile: Any semihollow extruded profile other than class 1. Examples, Figures 2a and 2b.

hollow extruded profile: An extruded profile any part of whose cross section completely encloses a void.

class 1 hollow extruded profile: A hollow extruded profile, the void of which is round and one inch or more in diameter and whose weight is equally distributed on opposite sides of two or more equally spaced axes. Example, Figure 4.

class 2 hollow extruded profile: Any hollow extruded profile other than Class 1 which does not exceed a 5-inch diameter circumscribing circle and has a single void of not less than 0.375 inch diameter or 0.110 square inch area. Example, Figure 5.

class 3 hollow extruded profile: Any hollow extruded profile other than Class 1 or Class 2. Example, Figure 6

solid extruded profile: An extruded profile other than hollow or semihollow. Example, Figure 7.

Table 1 — Classification - Semi-Hollow Extruded Profiles

GAP WIDTH inches	CLASS 1		CLASS 2	
	Group A Alloys	Group B Alloys	Group A Alloys	Group B Alloys
	RATIO*			
0.040-0.062	2.0	1.5	2.0	1.0
0.063-0.124	3.0	2.0	2.5	1.5
0.125-0.249	3.5	2.5	3.0	2.0
0.250-0.499	4.0	3.0	3.5	2.5
0.500-0.999	4.0	3.5	3.5	2.5
1.000-1.999	3.5	3.0	3.0	2.0
2.000 and over	3.0	2.5	3.0	2.0

GROUP A alloys are 1060, 1100, 3003, 5454, 6063, 6061
GROUP B alloys are 2011, 2014, 2024, 5083, 5086, 5456, 6066, 7001, 7075, 7178
* See Figure 3 for typical methods of figuring ratios.