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| <p>Accredited Standards Committee H35</p> <p>ALUMINUM and ALUMINUM ALLOYS</p> <p>ANSI Accredited Standards Committee</p> | <p>Secretariat:</p> <p>The Aluminum Association, Inc. 1400 Crystal Drive, Suite 430 Arlington, VA 22202</p> <p>Telephone: (703) 358-2978 e-mail: smuhamed@aluminum.org</p> |
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DATE: March 28, 2023

TO: Edgar Alonso Macias
emacias02@txtav.com

FROM: Sam Muhamed
 Manager, Standards & Technology
smuhamed@aluminum.org

SUBJECT: Re: ANSI H35.2 interpretation for Angularity

Dear Mr. Macias,

The question that you submitted was reviewed by our Technical Committee on Product Standards. Your question and our response to it are as follows:

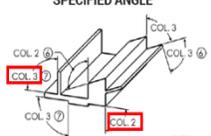
Your Question:

I would like to clarify which is the correct tolerance that applies for the angularity of an aluminum extrusion like the one represented in the picture below.

In the graphical representation in table 11.14 of ANSI H35.2, I have marked with red rectangles the 2 features that could be measured to determine the actual angularity between legs of an extrusion.

TABLE 11.14 Angularity ① ②—Extruded Bar and Profiles

| TEMPER | MINIMUM SPECIFIED LEG THICKNESS in. | TOLERANCE Degrees plus and minus | | |
|-----------------------|-------------------------------------|--|----------------|--|
| | | ALLOWABLE DEVIATION FROM SPECIFIED ANGLE | | |
| | | RATIO: ③ ④ LEG OR SURFACE LENGTH TO LEG OR METAL THICKNESS | | |
| | | 1 and less | Over 1 thru 40 | |
| | Col. 1 | Col. 2 | Col. 3 | |
| All except 0, TX510 ⑤ | Up thru 0.187 | 1 | 2 | |
| | 0.188–0.749 | 1 | 1½ | |
| | 0.750 and over | 1 | 1 | |
| 0 | Up thru 0.187 | 3 | 6 | |
| | 0.188–0.749 | 3 | 4½ | |
| | 0.750 and over | 3 | 3 | |



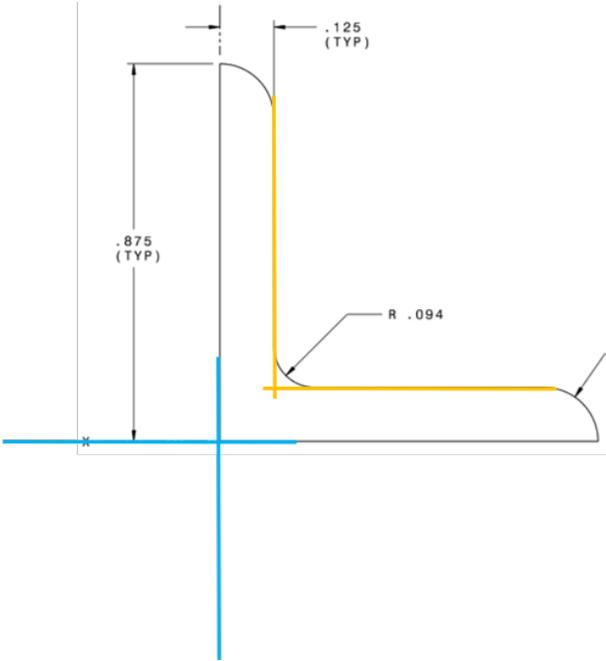
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In the cross-section view of the example 90° angle extrusion below, I have marked with orange lines the internal surfaces of the extrusion and with blue lines the external sides.

- In this extrusion, shall the angularity tolerance be +/- 2° per column 3 measured either on the internal or the external faces of the legs?

Or,

- Shall the angle measured from the external surfaces meet the column 2 tolerance whilst the angle measured from the internal surfaces shall meet column 3 tolerance?



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Our Response:

Assuming that the part is not in temper O or TX510.

Given thickness: 0.125" Tolerances up thru 0.187" apply.

Length of leg forming the angle: $0.875" - 0.125" = 0.750"$

Ratio of leg length to leg thickness = $0.750/0.125 = 6$

Col. 2 and col. 3 are not selected based on whether the measured angles lie on the inside or the outside of the extrusion. Col. 2 applies when the ratio of leg/surface length or leg/metal thickness is ≤ 1 . Col. 3 applies when the ratio of leg/surface length or leg/metal thickness lies between > 1 and ≤ 40 .

In the given illustration, col. 3 applies since the ratio is 6.

Therefore, the angularity tolerance is $\pm 2^\circ$. This applies to both the internal angle indicated by orange lines and the external angle indicated by blue lines.

The Technical Committee on Product Standards would like to thank you for the opportunity to provide an interpretation of the angularity tolerance measurements in ANSI H35.2.

With best regards,



Sam Muhamed

cc: TCPS Members
ASC H35 Members
Dima Atiya – Baker & Hostetler
"Response Letters to Interpretation Questions" Folder