Accredited Standards Committee H35 ALUMINUM and ALUMINUM ALLOYS ANSI Accredited Standards Committee	**Secretariat:** **The Aluminum Association, Inc.** **1400 Crystal Drive, Suite 430** **Arlington, VA 22202** **Telephone: (703) 358-2989** **e-mail:** jweritz@aluminum.org

DATE: March 8, 2021

TO: Karin Chiu
karin_chiu@hodakatec.com

FROM: John Weritz
Vice President, Standards & Technology
jweritz@aluminum.org

RE: Question about measurement way of TWIST

Dear Ms. Chiu,

The question that you submitted on December 6, 2020 was reviewed by our Technical Committee on Product Standards. The response is summarized as follows:

Your Question:

Email 1

Hello Sir/Madam,

I am Karin from Hodaka Taiwan. Regarding the measurement way of TWIST, we have seen your video online and kindly need your advice to see if our understanding is correct or not.

Below is our understanding, depends on how many points you press:

Accredited Standards Committee H35

ALUMINUM and ALUMINUM ALLOYS

ANSI Accredited Standards Committee

Secretariat:

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1400 Crystal Drive, Suite 430
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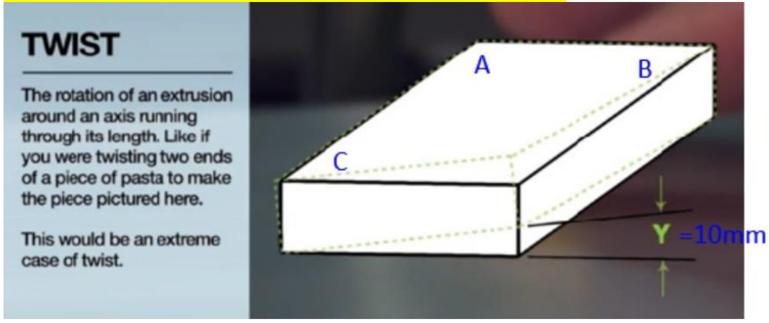
Telephone: (703) 358-2989
e-mail: jweritz@aluminum.org

A) If Press A, B, C points → Twist = Y = 10mm

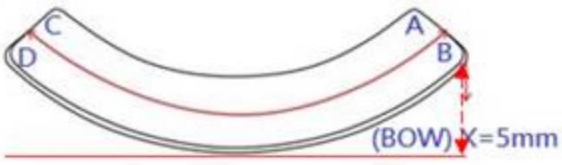


The rotation of an extrusion around an axis running through its length. Like if you were twisting two ends of a piece of pasta to make the piece pictured here.

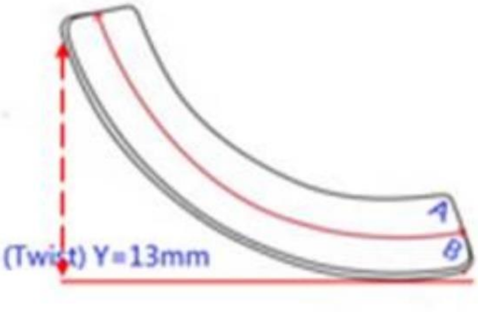
This would be an extreme case of twist.

B) If Press A, B only (Sometimes point C is pretty hard to press on the same flat surface due to thicker thickness etc.)

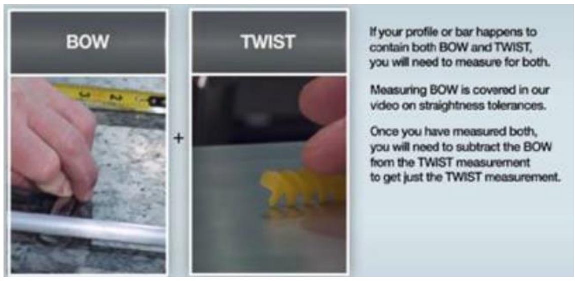
- **Step 1 : Put the extruded profiles on the table → Get the bow X=5mm**



- **Step 2: Press A, B → Get the Y=13mm**



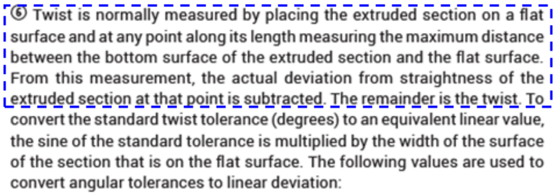
- **Step 3: So, the actual twist → 13-5 = 8mm, am I right?**



If your profile or bar happens to contain both BOW and TWIST, you will need to measure for both.

Measuring BOW is covered in our video on straightness tolerances.

Once you have measured both, you will need to subtract the BOW from the TWIST measurement to get just the TWIST measurement.



⑥ Twist is normally measured by placing the extruded section on a flat surface and at any point along its length measuring the maximum distance between the bottom surface of the extruded section and the flat surface. From this measurement, the actual deviation from straightness of the extruded section at that point is subtracted. The remainder is the twist. To convert the standard twist tolerance (degrees) to an equivalent linear value, the sine of the standard tolerance is multiplied by the width of the surface of the section that is on the flat surface. The following values are used to convert angular tolerances to linear deviation:

We will be really appreciated your confirmation and looking forward to hearing from you soon, thanks a lot!

Email 2

Hi Sam,

It’s glad to receive your email. Since I have no question on the measurement way, press A,B,C, directly get the Y=Twist, here I am trying to explain more clearly on our real situation as below, and thanks for your help

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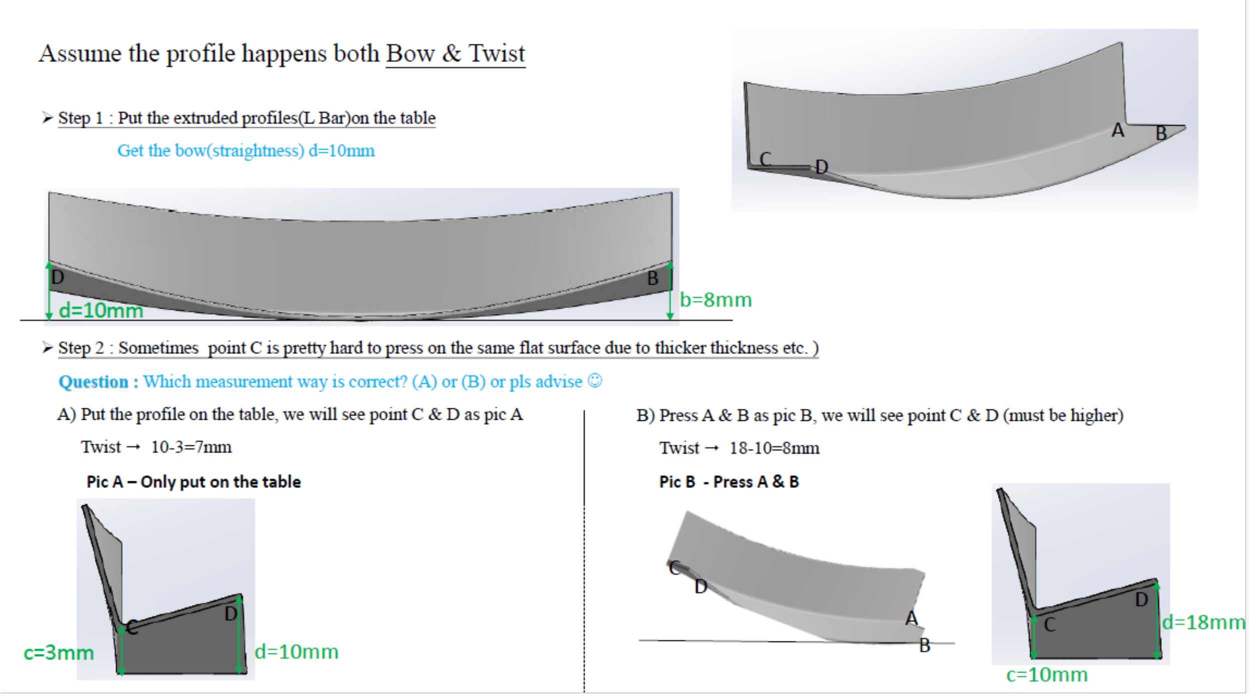

Assume the profile happens both Bow & Twist

- Step 1 : Put the extruded profiles(L Bar)on the table

  Get the bow(straightness) d=10mm

- Step 2 : Sometimes point C is pretty hard to press on the same flat surface due to thicker thickness etc.)

Question : Which measurement way is correct? (A) or (B) or pls advise ☺

A) Put the profile on the table, we will see point C & D as pic A

Twist → 10-3=7mm

Pic A – Only put on the table

B) Press A & B as pic B, we will see point C & D (must be higher)

Twist → 18-10=8mm

Pic B - Press A & B

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Our Response:

Thank you for writing to us. We are pleased to know that you have had the opportunity to view our latest video series on extrusion tolerances.

In your question “Which measurement way is correct? (A) or (B)”, option (B) is correct. For measuring twist across the length of the profile, option (B) accounts for total twist from end to end after subtracting the appropriate bow measurement.

While measuring bow and twist, it would be advisable to position the part on the table such that bow is arching upwards, by which points A, B and D may be placed in contact with the surface. It may be helpful to use the edge of the table or to use additional supports in order to take measurements in such an orientation. A digital protractor may be especially useful in determining twist when such physical restrictions apply. It is also important to ensure footnote 3 is considered, whereby the tolerances are measured such that the weight of the part minimizes the deviation.

With best regards,

John G. Weritz

cc: TCPS Members
ASC H35 Members
Project PS20-111
Lee Simowitz – Baker & Hostetler
“Response Letters to Interpretation Questions” Folder

ATTACHMENTS
Emails Correspondences

From: THT-邱姿芳 <karin_chiu@hodakatec.com>
Sent: Monday, February 01, 2021 4:38 AM
To: Sam Muhamed <smuhamed@aluminum.org>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hi Sam,

I update the attachment based on your feedback, pls have a look. Big thanks☺

Best Regards,
邱姿芳 Karin Chiu
TEL : 06-5050560 EX 2343

From: Sam Muhamed <smuhamed@aluminum.org>
Sent: Tuesday, January 26, 2021 11:29 PM
To: THT-邱姿芳 <karin_chiu@hodakatec.com>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hello Karin,

Would you happen to have a specific part for which you are looking to measure tolerances? If there is, for example, an L-shaped profile as shown in your email for which you have specifications, I could share it with our committee if it is non-confidential.

Yours sincerely,

The Aluminum Association
Sam A. Muhamed
Project Manager, Standards & Technology
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2978 | **C** 864.624.6908

JOIN THE CONVERSATION:

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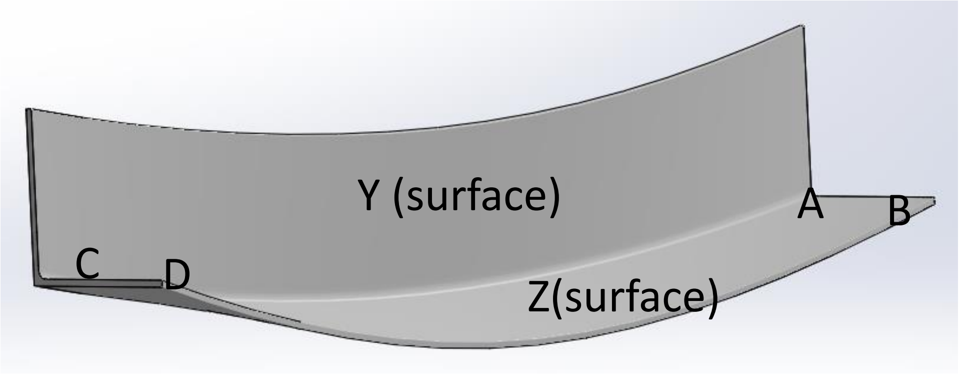
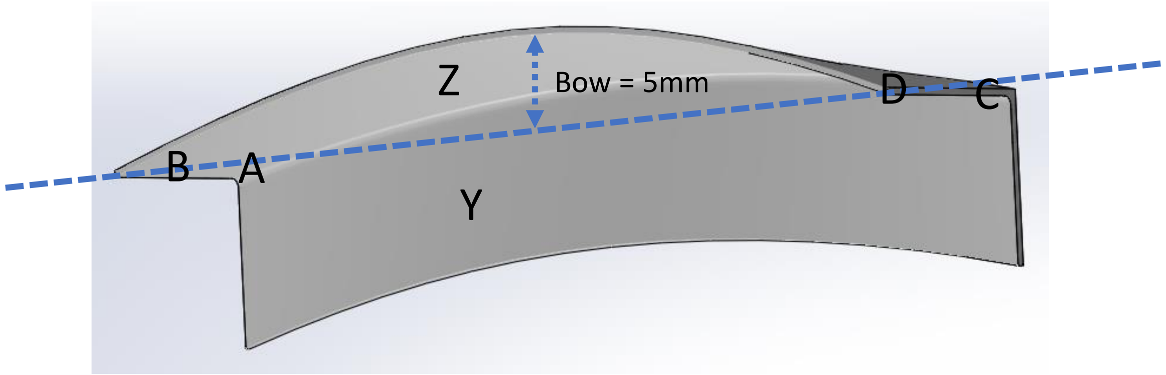
Assume the profile happens both Bow & Twist


Y (surface)
A
B
C
D
Z(surface)

- For **BOW** measurement

Put the profile on the marble platform(arching upwards)

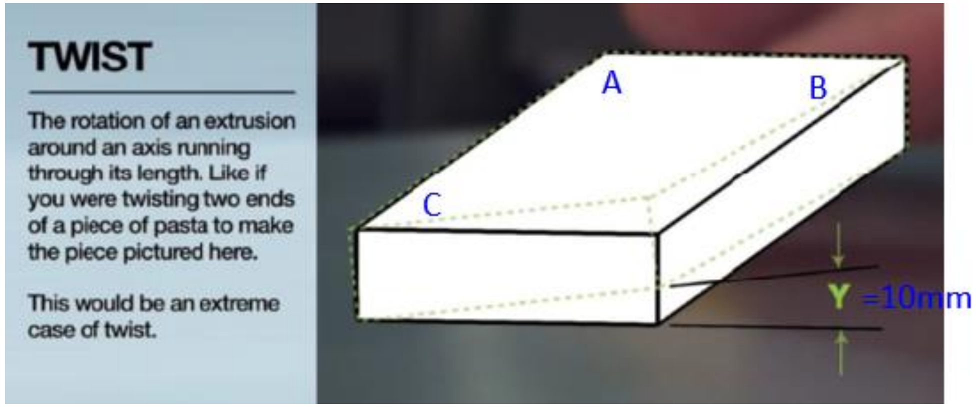

Z
Bow = 5mm
D
C
B
A
Y

→ Get the bow for Z(surface) =5mm

Assume the profile happens both Bow & Twist

- For **TWIST** measurement

  I understand the for the idea situation, we should press A, B, C point

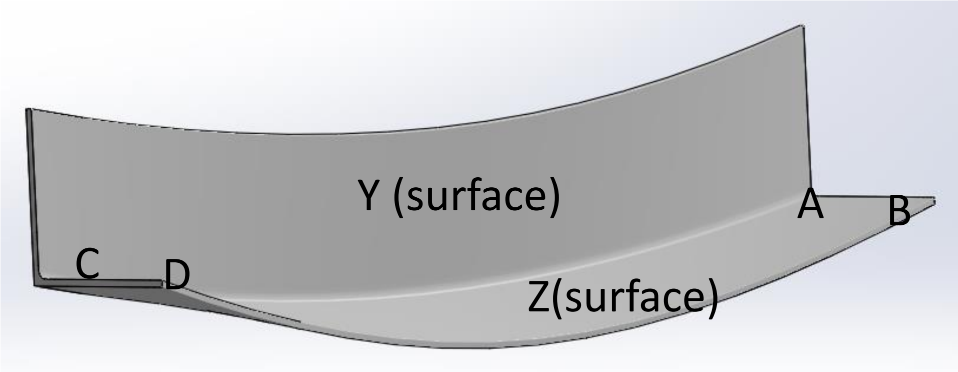


TWIST

The rotation of an extrusion around an axis running through its length. Like if you were twisting two ends of a piece of pasta to make the piece pictured here.

This would be an extreme case of twist.

→ Get the twist = Y = 10mm

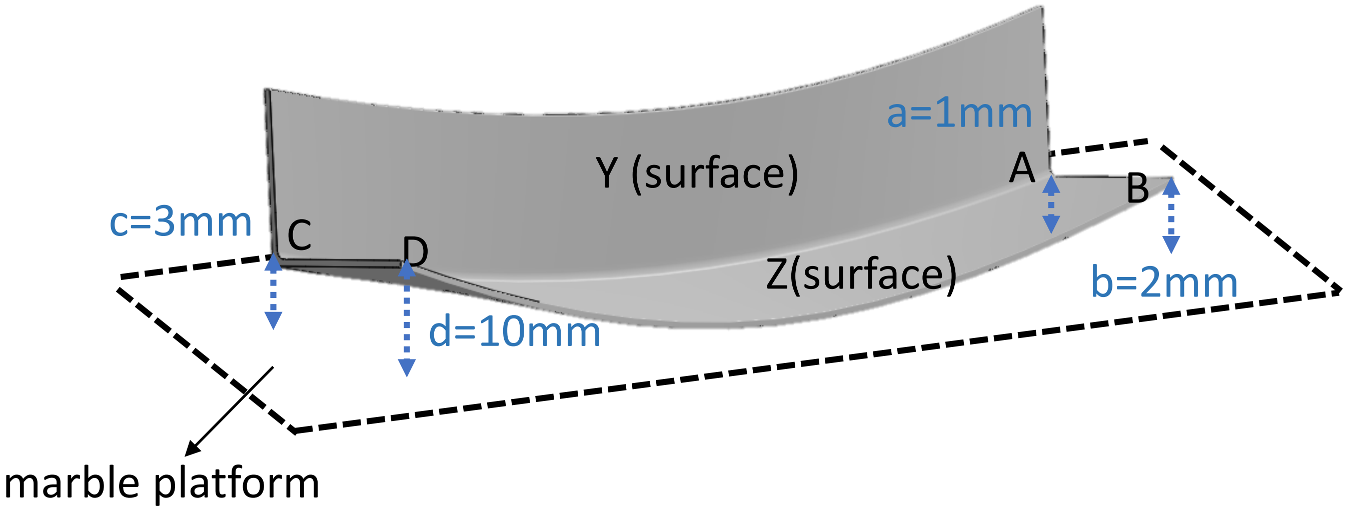


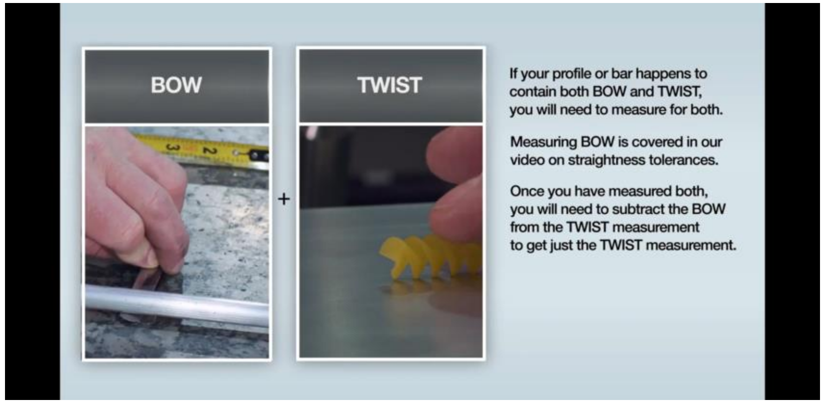
Assume the profile happens both Bow & Twist

- However, if the profile is hard to press A, B, C point
  Put the profile on the marble platform

  The highest distance between marble platform and profile is point d=10mm.

  So, the actual twist → 10-5=5mm, am I right?





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contain both BOW and TWIST,
you will need to measure for both.

Measuring BOW is covered in our
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Once you have measured both,
you will need to subtract the BOW
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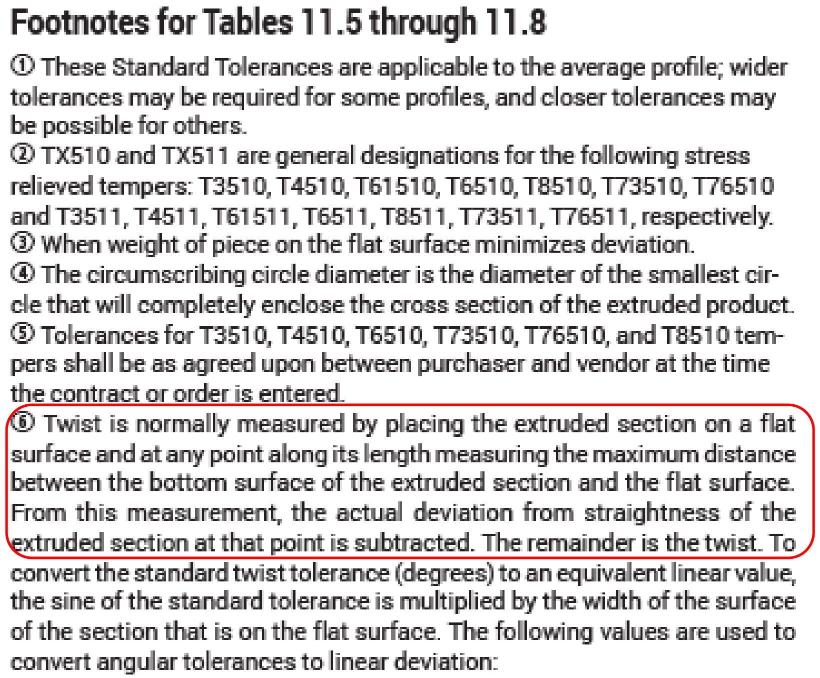
to get just the TWIST measurement.



Footnotes for Tables 11.5 through 11.8

① These Standard Tolerances are applicable to the average profile; wider tolerances may be required for some profiles, and closer tolerances may be possible for others.
② TX510 and TX511 are general designations for the following stress relieved tempers: T3510, T4510, T61510, T6510, T8510, T73510, T76510 and T3511, T4511, T61511, T6511, T8511, T73511, T76511, respectively.
③ When weight of piece on the flat surface minimizes deviation.
④ The circumscribing circle diameter is the diameter of the smallest circle that will completely enclose the cross section of the extruded product.
⑤ Tolerances for T3510, T4510, T6510, T73510, T76510, and T8510 tempers shall be as agreed upon between purchaser and vendor at the time the contract or order is entered.
⑥ Twist is normally measured by placing the extruded section on a flat surface and at any point along its length measuring the maximum distance between the bottom surface of the extruded section and the flat surface. From this measurement, the actual deviation from straightness of the extruded section at that point is subtracted. The remainder is the twist. To convert the standard twist tolerance (degrees) to an equivalent linear value, the sine of the standard tolerance is multiplied by the width of the surface of the section that is on the flat surface. The following values are used to convert angular tolerances to linear deviation:

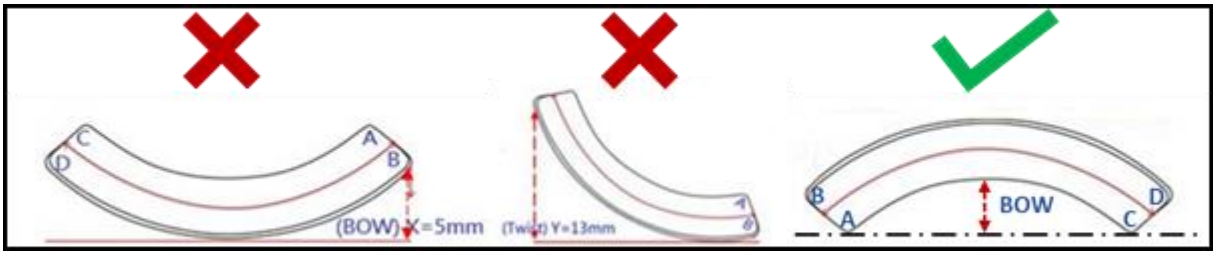
From: Sam Muhamed
Sent: Monday, January 25, 2021 3:42 PM
To: THT-邱姿芳 <karin_chiu@hodakatec.com>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hello Karin,

Glad to hear from you and I hope you, your family and colleagues had a wonderful and safe New Year break.

Our technical committee is reviewing a draft response to your inquiry for corrections. I expect to write back to you this week. I apologize for the delay.

In the meanwhile, informally, I would like to suggest that when measuring bow, it may be better to orient the bar such that the bow is arching upwards. For the angle extrusion, it may be necessary to use additional supports or other means to take measurements in this orientation.



Yours sincerely,

Sam A. Muhamed
Project Manager, Standards & Technology
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2978 | **C** 864.624.6908

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From: THT-邱姿芳 <karin_chiu@hodakatec.com>
Sent: Monday, January 25, 2021 4:35 AM

To: Sam Muhamed <smuhamed@aluminum.org>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hello Sam,

Long time no see, wish you have a wonderful Christmas and New Year holiday.
May I know is there any feedback for below? Or feel free to let me know if I need to provide further information, thanks a lot!!

Best Regards,
邱姿芳 Karin Chiu
TEL : 06-5050560 EX 2343

From: Sam Muhamed <smuhamed@aluminum.org>
Sent: Tuesday, December 22, 2020 11:46 PM
To: THT-邱姿芳 <karin_chiu@hodakatec.com>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hello Karin,

Thank you for sending us more information about the question. The inquiry has been submitted to our technical committee for review. We expect to provide a response within 30 days contingent on obtaining consensus from the committee members.

Yours sincerely,

Sam A. Muhamed
Project Manager, Standards & Technology
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2978 | **C** 864.624.6908

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From: THT-邱姿芳 <karin_chiu@hodakatec.com>
Sent: Thursday, December 17, 2020 2:08 AM
To: Sam Muhamed <smuhamed@aluminum.org>
Cc: John Weritz <jweritz@aluminum.org>; Debra Weston <dweston@aluminum.org>; THT-李東暐 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hi Sam,

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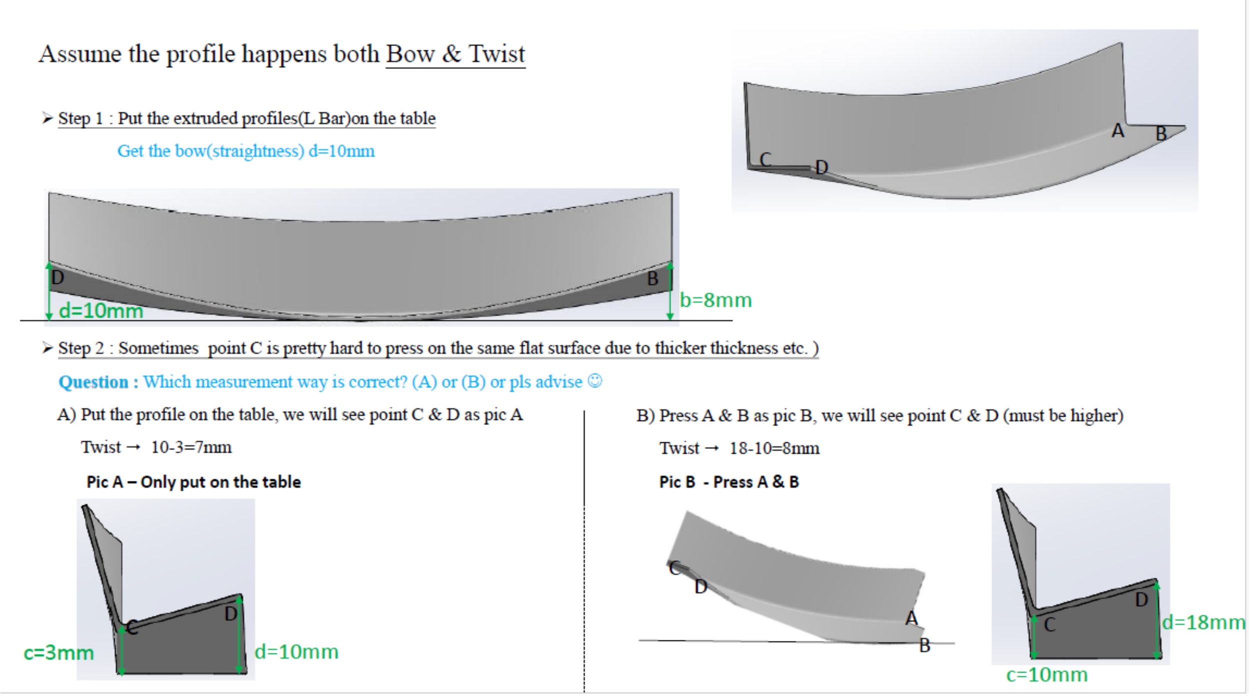

Assume the profile happens both Bow & Twist

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Twist → 10-3=7mm
Pic A – Only put on the table

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Twist → 18-10=8mm
Pic B - Press A & B

Best Regards,

邱姿芳 Karin Chiu

TEL : 06-5050560 EX 2343

From: Sam Muhamed <smuhamed@aluminum.org>
Sent: Wednesday, December 16, 2020 2:32 AM
To: THT-邱姿芳 <karin_chiu@hodakatec.com>
Cc: John Weritz <jweritz@aluminum.org>; Debra Weston <dweston@aluminum.org>; THT-李東曄 <kenny_lee@hodakatec.com>
Subject: RE: Question about measurement way of TWIST

Hello Karin,

Thank you for writing to us. I am pleased to know that you have had a chance to view our latest video series on extrusion tolerances.

It would be great if you could provide us certain additional information about the question as I believe I may not have understood the inquiry correctly. The twist appears to be related to the difference between C and D, but however, as the images describing the steps are 2D projections, I could be wrong.

Would you happen to have 3D images or photographs of actual models which are non-proprietary and not commercially sensitive that you could share with us to give us some more context about the twist measurements being made? With those in hand, I will then share your question with our technical committee, which will issue a formal response on how to interpret the measurement procedure in our standards.

Yours sincerely,

Sam A. Muhamed

Project Manager, Standards & Technology

The Aluminum Association

1400 Crystal Drive, Suite 430

Arlington, VA 22202

T 703.358.2978 | **C** 864.624.6908

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From: THT-邱姿芳 <karin_chiu@hodakatec.com>
Sent: Wednesday, December 09, 2020 8:17 PM
To: Standards Department <standards@aluminum.org>
Cc: THT-李東曄 <kenny_lee@hodakatec.com>
Subject: Question about measurement way of TWIST

Hello Sir/Madam,

I am Karin from Hodaka Taiwan. Regarding the measurement way of TWIST, we have seen your video online and kindly need your advice to see if our understanding is correct or not.

Below is our understanding, depends on how many points you press:

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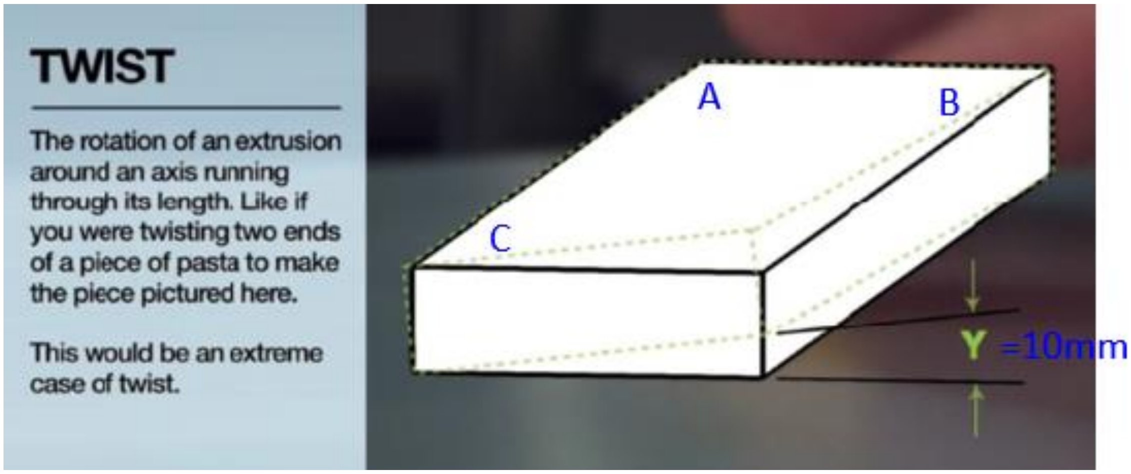

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This would be an extreme case of twist.

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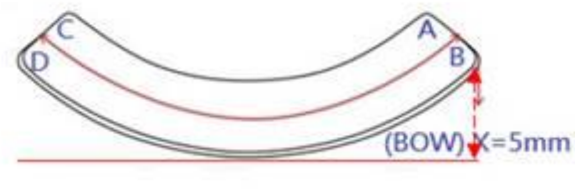
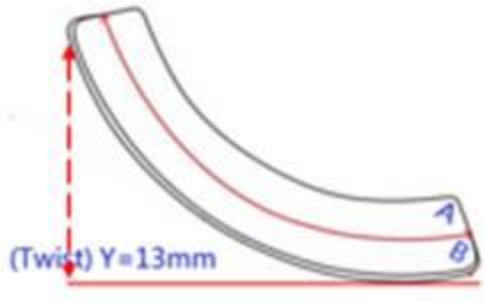
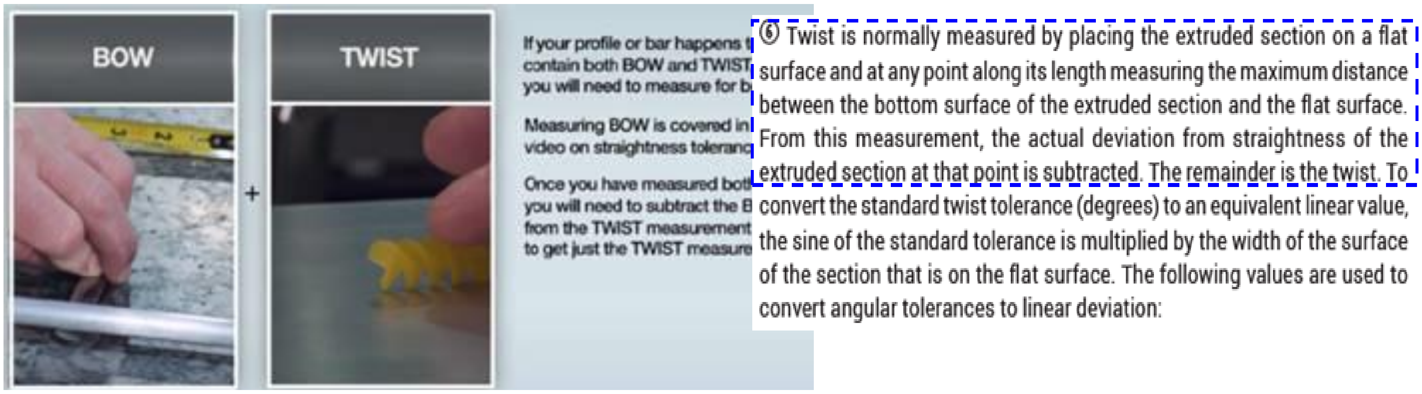
- **Step 1 : Put the extruded profiles on the table à Get the bow X=5mm**



- **Step 2: Press A, B à Get the Y=13mm**



- **Step 3: So, the actual twist à 13-5 = 8mm, am I right?**



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We will be really appreciated your confirmation and looking forward to hearing from you soon, thanks a lot!

Best Regards,

邱姿芳 Karin Chiu

台灣穗高科技股份有限公司

TAIWAN HODAKA TECHNOLOGY CO. LTD.

741台南市新市區環東路一段2號

E-mail : karin_chiu@hodakatec.com

TEL : 06-5050560 EX 2343