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# GAIN Report

Global Agricultural Information Network

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## Japan

**Post:** Tokyo

### **Japan Seeks Public Comments on Proposed CLT Design Values**

**Report Categories:**

Wood Products

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**Report Highlights:**

On September 20, 2018, Japan's Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) invited public comments on a draft amendment to the notification concerning cross laminate timber (CLT) design values. The current CLT design value was derived from the strength value of Japanese cedar (sugi). The amendment includes the strength value of species from other categories, including Douglas-fir, Western hemlock and Southern yellow pine. The proposed amendment enables more accurate design value calculations for CLT made from these species. MLIT invites public comments on the draft amendment by October 19, 2018.

Keywords: JA8076, Engineered Wood Products (EWPs)

**General Information:**

On September 20, 2018, Japan’s Ministry of Land, Infrastructure, Transport and Tourism (MLIT) invited public comments on the draft amendment to MLIT Notification No. 1024 (2001) “Specification of special allowable unit stresses and special material strength” concerning CLT design values.

Based on [Japanese Agricultural Standard \(JAS\) for CLT](#) (revised on March 29, 2018; [JA8028](#)), wood species are categorized from E1 (strongest) to E5 (weakest) in terms of strength value of visually graded lamina (Table 1). On March 31, 2018, MLIT amended the 2001 Ministerial Notification that established the material quality and strength value of CLT lamina that were based on Japanese cedar (sugi), whose performances had been tested and verified. The current standard does not recognize the design strength value of lamina made from stronger species (E1 to E4). In the revised notification, MLIT added design values of all species shown in Table 1.

Table 1: Strength Value Categories of Lamina

Category	Species Name
E1	Douglas-fir, Western larch, Southern yellow pine, Dahurian larch
E2	hinoki (Japanese cypress), hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford cedar
E3	Western hemlock, Japanese hemlock, Alaska yellow-cedar, Monterey (radiata) pine
E4	Grand fir, Noble fir, Spruce, lodgepole pine, Japanese fir, Sakhalin fir, Yezo spruce, Scots pine, Jack pine, Korean pine
E5	sugi (Japanese cedar), Western red-cedar, white cypress pine

In the same notification, MLIT added two stronger categories for machinery graded lamina. The current notification specifies the strength value of products made from sugi as M30 and M60. However, with the introduction of products made from stronger species categories, MLIT proposes the addition of M90 and M120 strength values – allowing greater utility of the new species categories.

The technical details of the draft amendments can be found [here](#)<sup>1</sup> (Japanese only) and a provisional translation of the tables are provided in Appendix 1 below. Following the public comment period, MLIT plans to finalize the amendment in November 2018, and effectuate the new notification three months later. Upon effectuation, the new notification allows the calculation of CLT design values made from lamina of these species without acquiring Ministerial approval.

**Submitting comments:** Comments should be submitted in Japanese no later than October 19, 2018, by mail, fax, email, or through the [e-Gov](#) website.

**e-Gov websites:**

Go to [e-Gov](#). Click “意見提出フォームへ” to submit your comments.

**FAX comments to:**

+81-(0)3-5253-1630

<sup>1</sup> <http://search.e-gov.go.jp/servlet/PcmFileDownload?seqNo=0000178265>

**Mail comments to:**

〒100-8918 2-1-3 Kasumigaseki, Chiyoda-ku, Tokyo

To: Ministry of Land, Infrastructure, Transport and Tourism, Housing Bureau Building, Guidance Division, *Attn.*: Public Comments Team

Include “Public comments on draft notification amendments of specifying allowable stress and design value” at the top of your comments.

**e-Mail comments to:**

[kenshi@mlit.go.jp](mailto:kenshi@mlit.go.jp)

Include “Public comments on draft notification amendments of specifying allowable stress and design value” in the subject line.

**Appendix 1: Provisional Translation and Summary of Amendment**

The JAS CLT standard includes five species groups (E1 to E5) for visually graded lamina and four grades with A

and B types (M120AB, M90AB, M60AB and M30AB) for mechanically graded lamina. The lamina strengths for bending and tension proposed in the Notification are identical to those specified in the JAS standard. The current lamina strengths for the species group of sugi (E5, M60AB and M30AB) remain unchanged.

The proposed amendment makes no changes to Sections I or II (第一 or 第二), and proposes the changes to Section III (第三) as indicated in red below.

Section III-9, Table 1-1: Compression strength of MSR or E-rated lamina for calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Grade	Value specified in the Notification	Mean strength specified in the JAS CLT standard
M120A or M120B	<b>33.6</b>	N/A
M90A or M90B	<b>27.6</b>	N/A
M60A or M60B	21.6	N/A
M30A or M30B	15.6	N/A

LT standard does not specify the compression strength of lamina.

Section III-9, Table 1-2: Compression strength of visually graded lamina for calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Species	Notification		JAS CLT standard	
	Grade	Compressive strength	JAS Grade	Mean strength
Dahurian larch, Southern pine, Douglas-fir, and Western larch	VG1	<b>36.0</b>	E1	N/A
	VG2	<b>26.4</b>		N/A
hinoki (Japanese cypress), hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford cedar	VG1	<b>33.6</b>	E2	N/A
	VG2	<b>24.0</b>		N/A
Japanese hemlock, Alaska yellow-cedar, Monterey (radiata) pine, and Western hemlock	VG1	<b>31.2</b>	E3	N/A
	VG2	<b>21.6</b>		N/A
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Korean pine, Ponderosa	VG1	<b>28.8</b>	E4	N/A
	VG2	<b>19.2</b>		N/A
sugi (Japanese cedar), Western red-cedar, and white cypress pine	VG1	26.4	E5	N/A
	VG2	16.8		N/A

- The JAS CLT standard does not specify the compression strength of lamina.

Section III-9, Table 2-1: Tension strength of lamina used for calculation of specified design strength of CLT  
Tension strength of MSR or E-rated lamina for calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Grade	Value specified in the Notification	Mean strength specified in the JAS CLT standard
M120A or M120B	<u>25.0</u>	25.0
M90A or M90B	<u>20.5</u>	20.5
M60A or M60B	16.0	16.0
M30A or M30B	11.5	11.5

Section III-9, Table 2-2: Tension strength of visually graded lamina for calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Species	Notification		JAS CLT standard	
	Grade	Tension strength	JAS Grade	Mean strength
Dahurian larch, Southern pine, Douglas-fir, and Western larch	VG1	<u>26.5</u>	E1	26.5
	VG2	<u>20.0</u>		20.0
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, and Port Orford Cedar	VG1	<u>24.5</u>	E2	24.5
	VG2	<u>18.0</u>		18.0
Japanese hemlock, Alaska yellow-cedar, radiata pine, and Western hemlock	VG1	<u>23.5</u>	E3	23.5
	VG2	<u>16.5</u>		16.5
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), Spruce, lodgepole pine, Korean pine, Ponderosa pine, Scots pine, and Jack pine	VG1	<u>21.5</u>	E4	21.5
	VG2	<u>14.5</u>		14.5
sugi, Western red-cedar, and white cypress pine	VG1	20.0	E5	20.0
	VG2	12.5		12.5

Section III-9-3: The bending strength of lamina is used to calculate the specified design strength of CLT.

- \* The stronger axis in the direction of lamination is limited to 3 layers-3 ply, 3 layers-4 ply, 5 layers-5 ply and 5 layers-7 ply.
- \* The weaker axis in the direction of lamination is limited to 3 layers-3 ply, 3 layers-4 ply, 5 layers-5 ply and 5 layers-7 ply or 7 layers-7 ply.

Section III-9, Table 3-1: The bending strength of MSR or E-rated lamina for calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Grade	Value specified in the Notification	Mean strength specified in the JAS CLT standard
M120A or M120B	<b><u>42.0</u></b>	42.0
M90A or M90B	<b><u>34.5</u></b>	34.5
M60A or M60B	27.0	27.0
M30A or M30B	19.5	19.5

Section III-9, Table 3-2: The bending strength of visually graded lamina for the calculation of specified design strengths (Unit: N/mm<sup>2</sup>)

Species	Notification		JAS CLT standard	
	Grade	Bending strength	JAS Grade	Mean strength
Dahurian larch, Southern pine, Douglas-fir, and Western larch	VG1	<b><u>45.0</u></b>	E1	45.0
	VG2	<b><u>33.0</u></b>		33.0
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, and	VG1	<b><u>42.0</u></b>	E2	42.0
	VG2	<b><u>30.0</u></b>		30.0
Japanese hemlock, Alaska yellow-cedar, radiata pine, and Western hemlock	VG1	<b><u>39.0</u></b>	E3	39.0
	VG2	<b><u>27.0</u></b>		27.0
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Korean pine, Ponderosa pine, Scots pine,	VG1	<b><u>36.0</u></b>	E4	36.0
	VG2	<b><u>24.0</u></b>		24.0
sugi, Western red-cedar, and white cypress pine	VG1	33.0	E5	33.0
	VG2	21.0		21.0

Section III-9-4: The specified design shear strength of CLT.

- \* The stronger axis in the direction of lamination is limited to 3 layers-3 ply, 3 layers-4 ply, 5 layers-5 ply and 5 layers-7 ply.
- \* The weaker axis in the direction of lamination is limited to 3 layers-3 ply, 3 layers-4 ply, 5 layers-5 ply and 5 layers-7 ply or 7 layers-7 ply.
- \* CLT made of mixed species shall conform to the minimum value.

Section III-9, Table 4-1: Specified design strengths in direction of lamination (Unit: N/mm<sup>2</sup>)

Species	Notification
	Specified design shear strength
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford Cedar, Dahurian larch, Southern pine, Douglas- fir, white cypress pine, and Western larch	<b><u>1.2</u></b>
Japanese hemlock, Alaska yellow-cedar, Korean pine, radiata pine, and Western hemlock	<b><u>1.1</u></b>
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Ponderosa pine, Scots pine, and Jack pine	<b><u>1.0</u></b>
sugi, and Western red-cedar	<b><u>0.9</u></b>

Section III-9, Table 4-2: Shear strength of lamina parallel to lamina grain used for calculation of specified design strength in the direction of CLT width. (Unit: N/mm<sup>2</sup>)

Species	Notification
	Shear strength of lamina parallel to
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford Cedar, Dahurian larch, Southern pine, Douglas- fir, white cypress pine, and Western larch	<b><u>3.6</u></b>
Japanese hemlock, Alaska yellow-cedar, Korean pine, radiata pine, and Western hemlock	<b><u>3.3</u></b>
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Ponderosa pine, Scots pine, and Jack pine	<b><u>3.0</u></b>
sugi, and Western red-cedar	<b><u>2.7</u></b>

Section III-9, Table 4-3: Shear strength of lamina perpendicular to lamina grain used for calculation of specified design strength in the direction of width of CLT. (Unit: N/mm<sup>2</sup>)

Species	Notification
	Shear strength of lamina perpendicular to lamina
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford Cedar, Dahurian larch, Southern pine, Douglas- fir, white cypress pine, and Western larch	<b><u>10.8</u></b>
Japanese hemlock, Alaska yellow-cedar, Korean pine, radiata pine, and Western hemlock	<b><u>9.9</u></b>
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Ponderosa pine, Scots pine, and Jack pine	<b><u>9.0</u></b>
sugi and Western red-cedar	<b><u>8.1</u></b>

Section III-9, Table 4-4: Torsional shear strength of lamina at corner joint of glued lamina for calculation of specified design strength in the direction of width of CLT. (Unit: N/mm<sup>2</sup>)

Species	Notification
	Torsional Shear strength of
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford Cedar, Dahurian larch, Southern pine, Douglas-fir, white cypress pine, and Western larch	<b><u>4.7</u></b>
Japanese hemlock, Alaska yellow-cedar, Korean pine, radiata pine, Western hemlock, Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Ponderosa pine, Scots pine, Jack pine, sugi, and Western red-cedar	<b><u>3.0</u></b>



Section III-9, Table 4-5: Rolling shear strength for calculation of specified design strength in the direction of width of CLT. (Unit: N/mm<sup>2</sup>)

Species	Notification
	Rolling shear
hinoki, hiba cypress, Japanese larch, Japanese red pine, Japanese black pine, Port Orford Cedar, Dahurian larch, Southern pine, Douglas-fir, white cypress pine, and Western larch	<b><u>2.0</u></b>
Japanese hemlock, Alaska yellow-cedar, Korean pine, radiata pine, and Western hemlock	<b><u>1.8</u></b>
Japanese fir, Sakhalin fir, Yezo spruce, fir (silver, noble, grand, etc), spruce, lodgepole pine, Ponderosa pine, Scots pine, and Jack pine	<b><u>1.6</u></b>
sugi and Western red-cedar	<b><u>1.5</u></b>