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Recent developments in the standardization of LVL and wood based panels

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Standardisation process at present

- Harmonized product standards (hEN) lead to CE marking of building products and ultimately facilitate the creation of a single market in Europe
- Currently there are 11 hEN's in the wood sector
  - the last published and EUOJ referenced complete hEN was on finger-jointed timber in 2014 and the latest amendment was on wood-based panels hEN in 2015
- All existing hEN's are based on the construction product directive (CPD), few amendments have been published according to construction product regulation (CPR)
- All hEN's need updating and need to be based on the construction product regulation
- Rules for the standardization process have changed
  - e.g. new classes need delegated acts
  - mandates need to changed to standardization requests in the near future
- Disputes between the Commission and Germany before the EU Court delay common rules
- Technical committees (TC) are carrying out work on updating the technical contents
- Main difficulties arise from formalities, changing rules and differing opinions inside the commission

hEN 13986 Wood-based panels

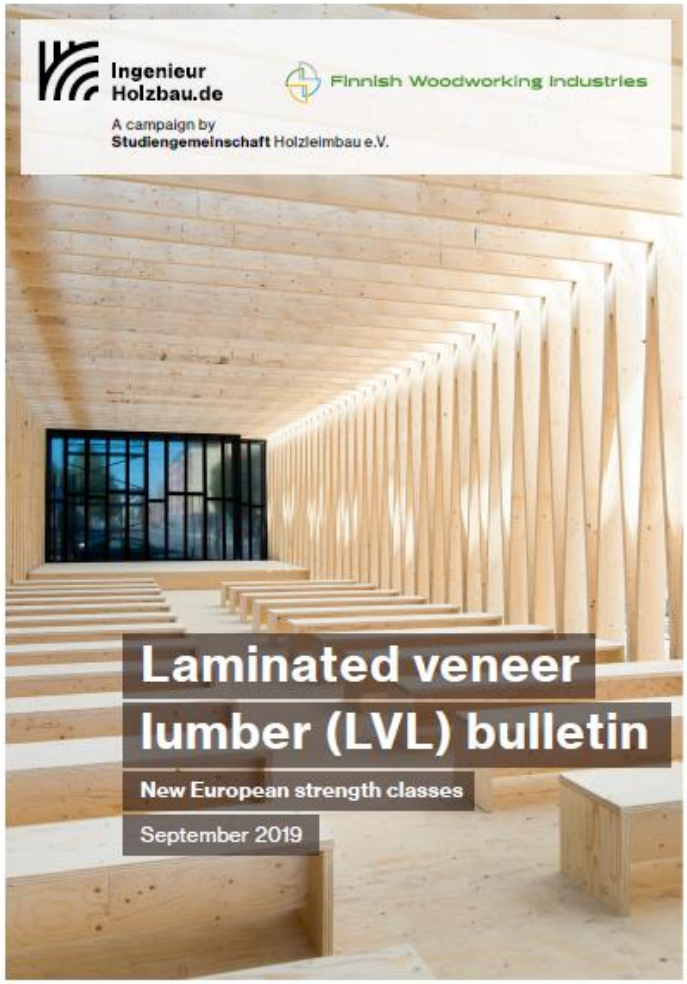
- Core hEN was published in 2004 and an amendment was published in 2015 in order to introduce some new characteristics and revise the informative annex ZA according to CPR
- CEN/TC 112 mandate working group is currently revising the technical content of the standard, under discussion are for example
  - removing non-structural LVL from the standard (only one LVL hEN 14374 in the future)
  - definition of biological durability
  - water vapor resistance values
  - Introduction of lower formaldehyde class
- Next working group meeting is in December, the technical work continues regardless of the standardization process uncertainties

hEN 14374 Laminated Veneer Lumber, LVL

- Core hEN was published in 2004 and the standard is completely according to CPD
- The need of revision was identified due to CPR but also combining all LVL under one standard along with introducing strength classes, GLVL and treated LVL were in the focus of the LVL industry
- CEN/TC 124 working group 3 started revision work in 2014 and LVL industry has been very actively involved
- Due to the latest developments in the standardization process delay of the standard is quite probable
- Work continues

LVL Bulletin published

- Due to the delays in the standardization process, the European LVL industry decided to start using the **LVL strength classes** before they are included in the harmonized standard.
- In collaboration with LVL industry, Federation of Finnish Woodworking Industries and German Studiengemeinschaft Holzleimbau a technical bulleting was published earlier this week
- The bulleting introduces
  - LVL strength classes
  - new tolerance definitions
  - few additional properties which are not included in the latest version of the harmonized standard revision anymore



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LVL-P strength classes

- **Table 2 — Strength class for LVL without crossband veneers**

Property [a]		Symbol	Unit	Strength class				
				LVL 32 P	LVL 35 P	LVL 48 P	LVL 50 P	LVL 80 P
Bending strength	Edgewise, parallel to grain (depth 300 mm)	$f_{m,0,edge,k}$	N/mm²	27	30	44	46	75
	Flatwise, parallel to grain	$f_{m,0,flat,k}$	N/mm²	32	35	48	50	80
	Size effect parameter	s	-	0,15	0,15	0,15	0,15	0,15
Tension strength	Parallel to grain (length 3 000 mm)	$f_{t,0,k}$	N/mm²	22	22	35	36	60
	Perpendicular to grain, edgewise	$f_{t,90,edge,k}$	N/mm²	0,5	0,5	0,8	0,9	1,5
Compression strength	Parallel to grain for service class 1	$f_{c,0,k}$	N/mm²	26	30	35	42	69
	For service class 2 according to EN 1995-1-1 [b]			21	25	29	35	57
	Perpendicular to grain, edgewise	$f_{c,90,edge,k}$	N/mm²	4	6	6	8,5	14
	Perpendicular to grain, flatwise (except pine)	$f_{c,90,flat,k}$	N/mm²	0,8	2,2	2,2	3,5	12
	Perpendicular to grain, flatwise, pine	$f_{c,90,flat,k,pine}$	N/mm²	MDV [c]	3,3	3,3	3,5	_ [d]

LVL-C strength classes

Table 3 — LVL with crossband veneers

Property [a]		Symbol	Unit	Strength class					
				LVL 22 C	LVL 25 C	LVL 32 C	LVL 36 C	LVL 70 C	LVL 75 C
Bedning strength	Edgewise, parallel to grain (depth 300 mm)	$f_{m,0,edge,k}$	N/mm²	19	20	28	32	54	60
	Flatwise, parallel to grain	$f_{m,0,flat,k}$	N/mm²	22	25	32	36	70	75
	Size effect parameter	s	-	0,15	0,15	0,15	0,15	0,15	0,15
	Flatwise, perpen-dicular to grain	$f_{m,90,flat,k}$	N/mm²	MDV [c]	MDV [c]	7	8	32	20
Tension strength	Parallel to grain (length 3000 mm)	$f_{t,0,k}$	N/mm²	14	15	18	22	45	51
	Perpendicular to grain, edgewise	$f_{t,90,edge,k}$	N/mm²	4	4	5	5	16	8
Compression strength	Parallel to grain for service class 1	$f_{c,0,k}$	N/mm²	18	18	18	26	54	64
	for service class 2 and according to EN 1995-1-1 [b]			15	15	15	21	45	53
	Perpendicular to grain, edgewise	$f_{c,90,edge,k}$	N/mm²	8	8	9	9	45	23
	Perpendicular to grain, flatwise (except pine)	$f_{c,90,flat,k}$	N/mm²	1,0	1,0	2,2	2,2	16	16
	Perpendicular to grain, flatwise, pine	$f_{c,90,flat,k,pine}$	N/mm²	MDV [c]	MDV [c]	3,5	3,5	_ d	_ d

LVL tolerances

Table 4 — Maximum deviations from nominal sizes and nominal angles for laminated veneer lumber not sanded and not treated by pressure treatment

Nominal sizes for		Maximum deviations
Thickness t	$t \leq 27$ mm	± 1 mm
	27 mm < $t \leq 57$ mm	± 2 mm
	$t > 57$ mm	± 3 mm
Width b	$b \leq 300$ mm	± 2 mm
	300 mm < $b \leq 600$ mm	± 3 mm
	$b > 600$ mm	± 0,5 %
Length l	$l \leq 5$ m	± 5 mm
	5 m < $l \leq 20$ m	± 0,1 %
	$l > 20$ m	± 20 mm
Maximum deviation α of the right angles of the cross-section, see Figure 3		1:50 (approximately 1,1°)

LVL standard revision summary

- Both LVL with parallel veneers **LVL-P**
  and LVL with crossband veneers **LVL-C** are included
- There is a strength class system (product categories)
- Glued laminated LVL is included **GLVL**
- Provisions for LVL being preservative treated or untreated against biological attack or treated to improve the reaction to fire performance have been added
- Layup factors for LVL with crossband veneers for the determination of properties of LVL with layups different to those being tested are given;
- More strength and stiffness properties are included and the respective test methods are introduced
- Different wood species may be used, but not re-used wood.

Conclusions

- The European standardisation process related to harmonised standards has encountered significant delays
- The standardisation technical committees continue to develop standards and harmonised standards
- A new requirement introduced:
  BWR7: Sustainable use of natural resources
- EU VOC classification is delayed
- Standards need completeness on requirements: exhaustive
- The Technical committees continue the technical development of standards
- A further years delay is very likely on referencing of harmonized European standards in the Official Journal of the European Union

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