



University of
Massachusetts
Amherst

Cross-Laminated Timber (CLT) construction

Item Type	event;event
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Download date	2026-03-14 19:53:32
Link to Item	https://hdl.handle.net/20.500.14394/50574

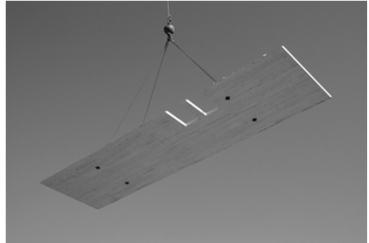
CROSS-LAMINATED TIMBER

AN OVERVIEW



1

Presentation Outline




2

Product Manufacturing Applications Connections Advantages

What is CLT?

Composition


Size Availability



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Product Manufacturing Applications Connections Advantages

CLT, X-LAM, Massive Timber, BSP




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Product Manufacturing Applications Connections Advantages

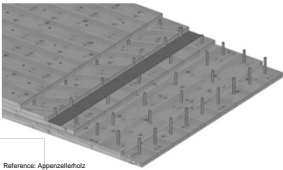
Related Products

Fastened with:

- Wooden dowels (Thoma Holz, Appenzellerholz, etc.)
- Nails (MHM)



Reference: Appenzellerholz



Reference: Appenzellerholz

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Product Manufacturing Applications Connections Advantages

History

- Initial Development
- Optimization
 - Austria (1996)

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Product Manufacturing Applications Connections Advantages

Manufacturing

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Current

- Countries leading in the use of CLT
 - Austria, Germany, Switzerland, Sweden, Norway, United Kingdom

Volume usage (m3)

Year	Volume Usage (m3)
1990	~0
1995	~0
2000	~0
2005	~100,000
2010	~300,000
2015	~1,000,000

Product **Manufacturing** Applications Connections Advantages

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Manufacturers

 76,000 m ³	 100,000 m ³	 17,000 m ³
 85,000 m ³	 28,000 m ³	 85,000 m ³
 15,000 m ³	 85,000 m ³	
 60,000 m ³		

Product **Manufacturing** Applications Connections Advantages

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Steps 1 and 2

Product **Manufacturing** Applications Connections Advantages

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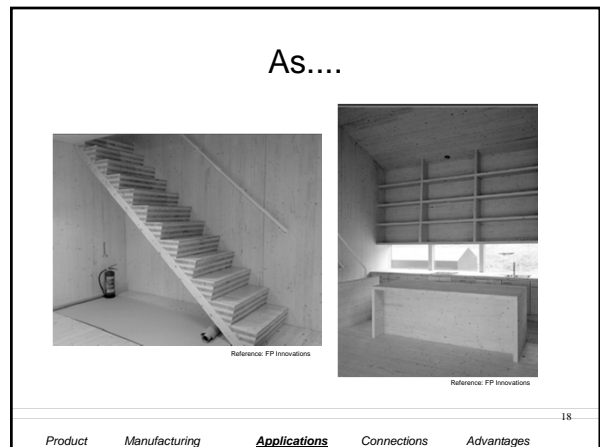
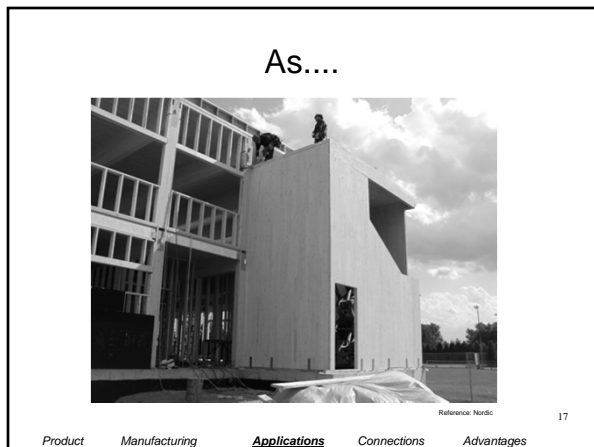
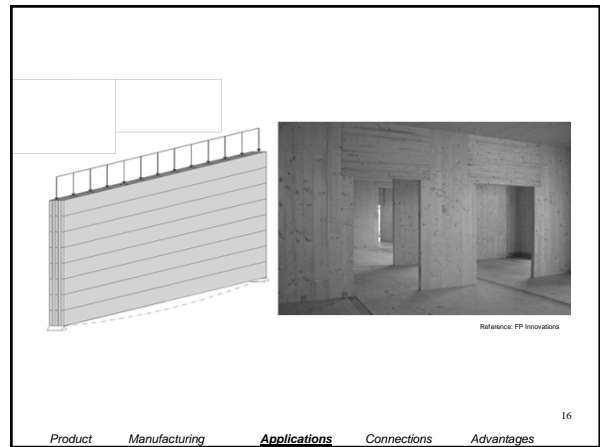
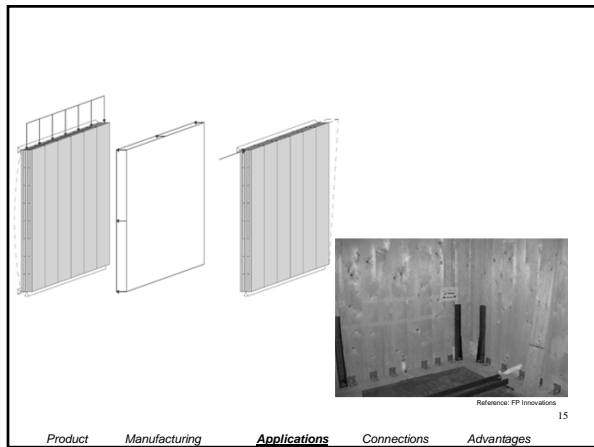
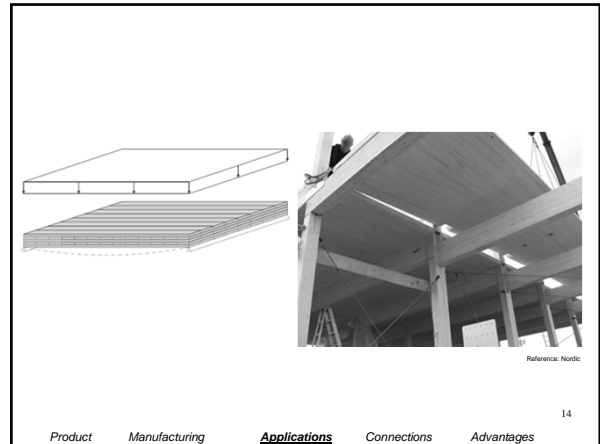
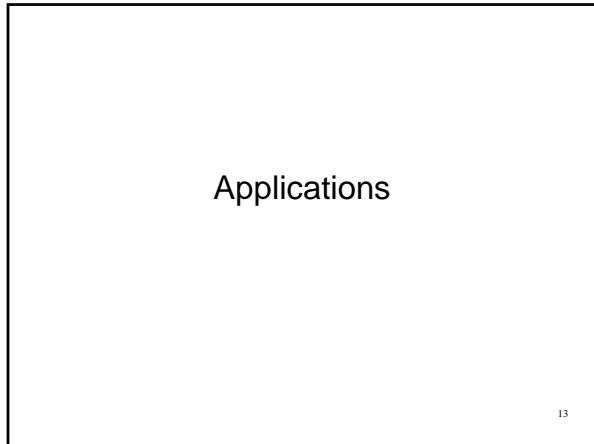
Steps 3 and 4

Product **Manufacturing** Applications Connections Advantages

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Product **Manufacturing** Applications Connections Advantages

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Roof

Reference: TU 清华大学

Product Manufacturing Applications **Connections** Advantages

As....

Reference: Nordic

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Product Manufacturing **Applications** Connections Advantages

As....

Reference: Hötzbau Untertalmer

Reference: EPFL, Switzerland

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Product Manufacturing **Applications** Connections Advantages

Connections

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Wall to Concrete

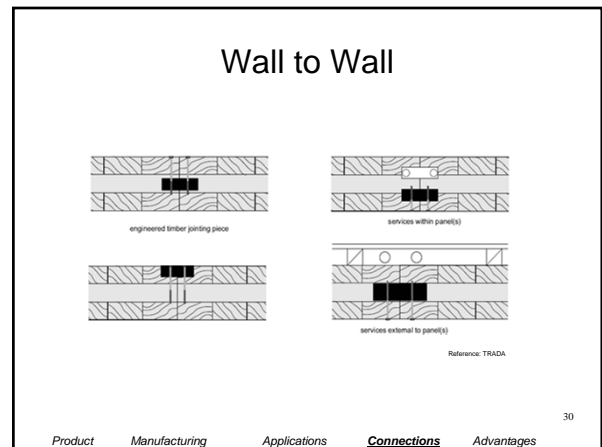
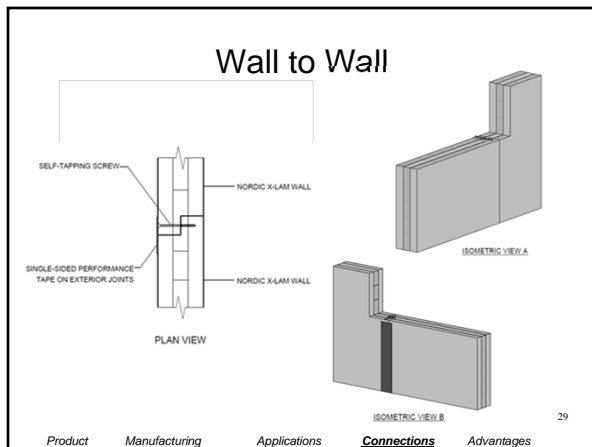
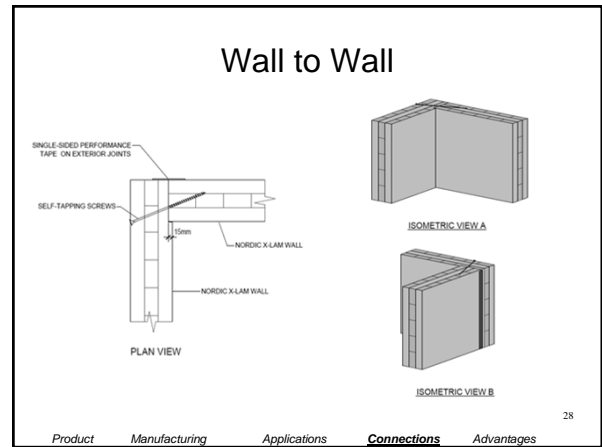
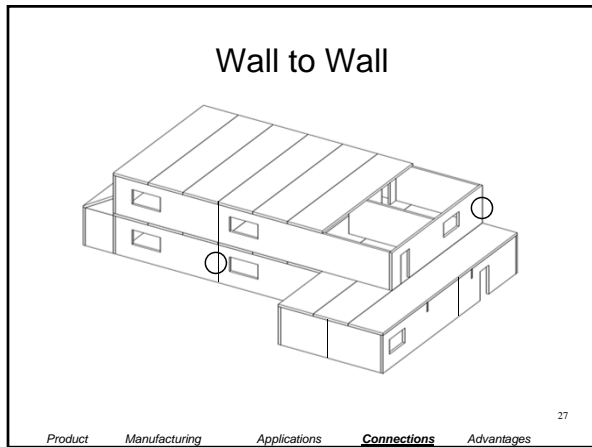
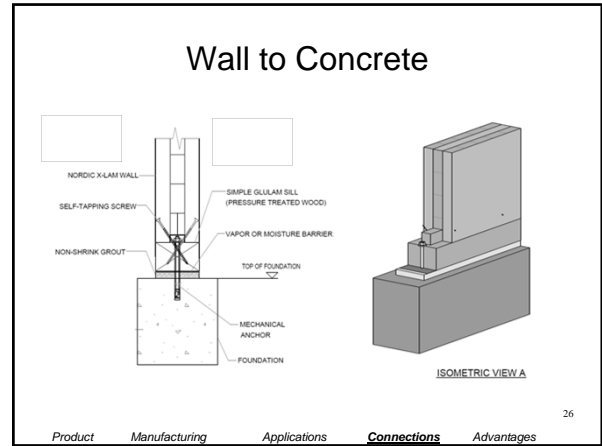
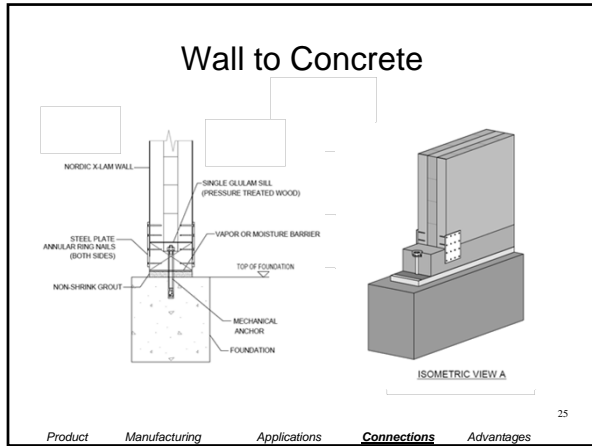
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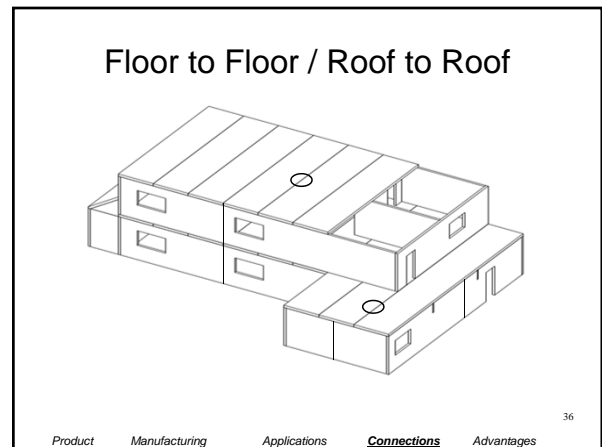
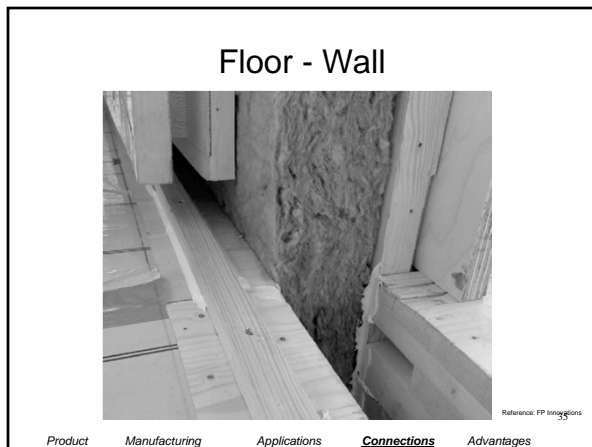
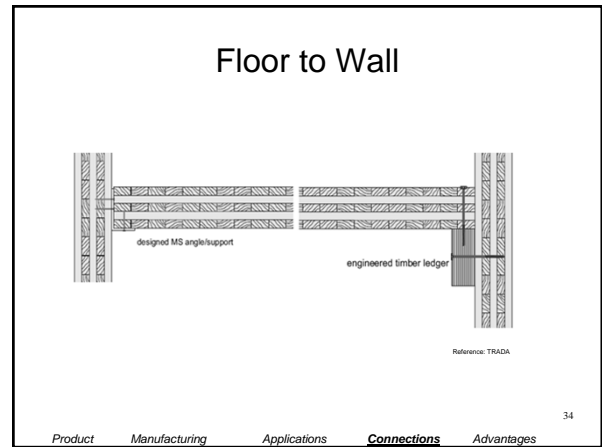
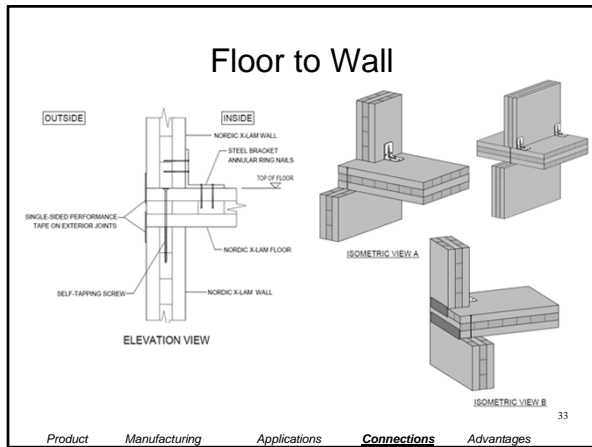
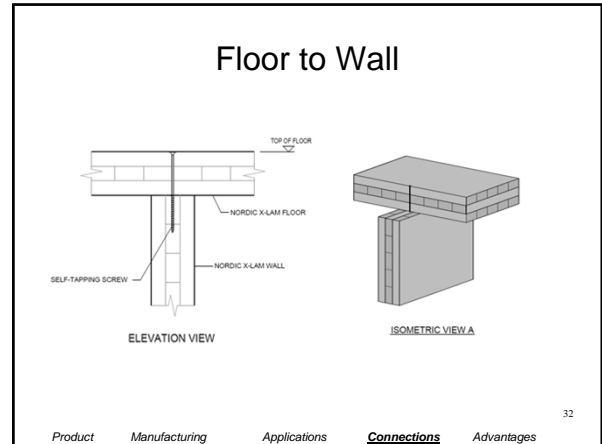
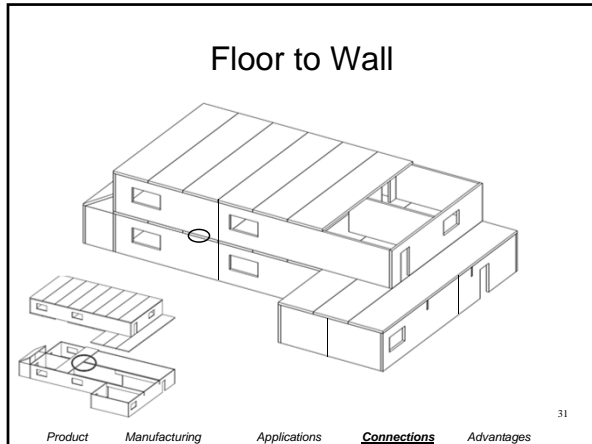
Product Manufacturing Applications **Connections** Advantages

Wall to Concrete

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Product Manufacturing Applications **Connections** Advantages





Floor to Floor / Roof to Roof

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Product Manufacturing Applications **Connections** Advantages

Floor to Floor / Roof to Roof

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Product Manufacturing Applications **Connections** Advantages

Roof

Reference: TU G99

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Product Manufacturing Applications **Connections** Advantages

Panel Handling

Reference: FP Innovations

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Product Manufacturing Applications **Connections** Advantages

Panel Handling

Reference: FP Innovations

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Product Manufacturing Applications **Connections** Advantages

Panel Handling

Reference: FP Innovations

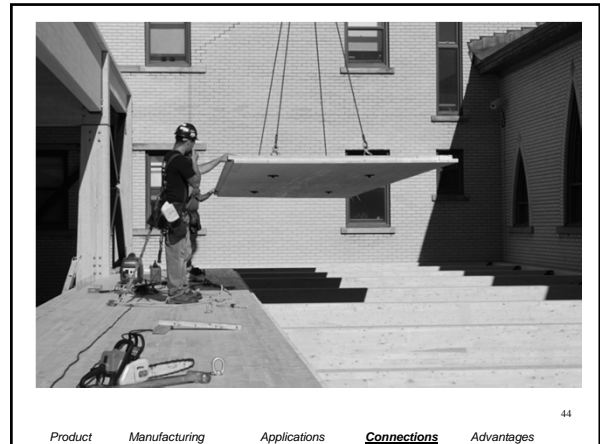
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Product Manufacturing Applications **Connections** Advantages



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Product Manufacturing Applications **Connections** Advantages



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Product Manufacturing Applications **Connections** Advantages

Advantages

Sustainable alternative solution to concrete and steel:

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Advantages

- Lightweight
- Strong
- Consistent
- Tolerances
- Easier for other trades

Reference: FP Innovations

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Product Manufacturing Applications **Connections** Advantages

Advantages

- High strength
- Seismic Resistance
- Exceptional fire performance
- Great thermal properties
- Vapour/air barrier

Reference: FP Innovations

Reference: FP Innovations

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Product Manufacturing Applications **Connections** Advantages

Advantages

Material	Floor span capability	Height capability
Steel	7m for metal deck floors	> 100 storeys
Concrete	9m for solid slabs	> 100 storeys
Masonry	7.5m for hollow core floor	7 storeys
Platform timber frame	6m for engineered timber joists	7 storeys or 20m
CL panels	8m for panels	12 storeys

Figure 2: Span and height capabilities of mainstream structural materials in multi-storey buildings

Reference: TRADA

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Product Manufacturing Applications **Connections** Advantages

Potential

- Address code issues
- Maximize the advantages
- Benefit from versatility

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Bridport House

Courtesy: EURBAN

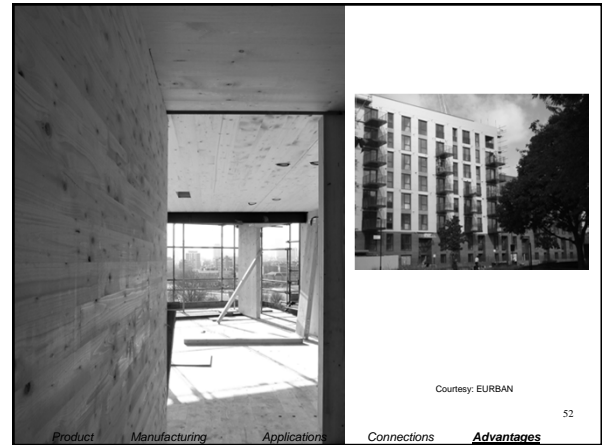
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Product Manufacturing Applications Connections **Advantages**



Courtesy: EURBAN

Product Manufacturing Applications Connections **Advantages**



Courtesy: EURBAN

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Product Manufacturing Applications Connections **Advantages**



Courtesy: Drost + van Veen

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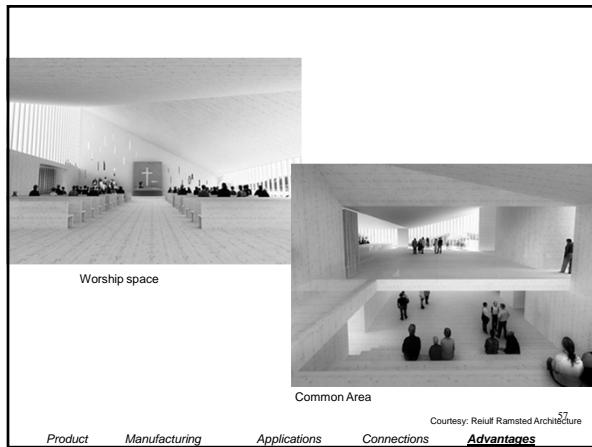
Product Manufacturing Applications Connections **Advantages**



Courtesy: Alex de Ruijter-drm

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Product Manufacturing Applications Connections **Advantages**





THANK YOU



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The slide features a clean, minimalist design with a white background and a black border. It is divided into three horizontal sections by thin lines. The top section contains the text 'THANK YOU' in a bold, sans-serif font. The middle section contains the 'NORDIC' logo on the left and the website address 'www.nordicewp.com' on the right. The bottom section contains the page number '62' in the bottom right corner.