



University of
Massachusetts
Amherst

Cross-Laminated Timber (CLT) construction

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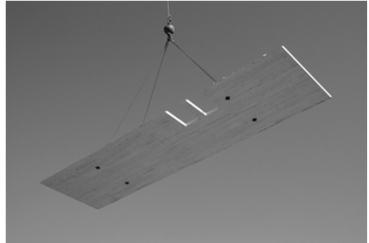
CROSS-LAMINATED TIMBER

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

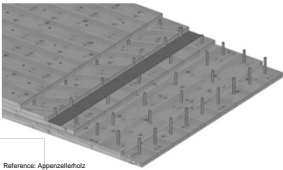
Related Products

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

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Product **Manufacturing** Applications Connections Advantages

Manufacturers

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

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Product **Manufacturing** Applications Connections Advantages

Steps 1 and 2

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Product **Manufacturing** Applications Connections Advantages

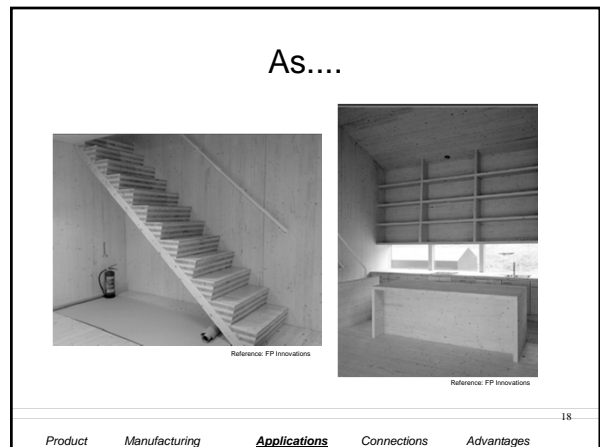
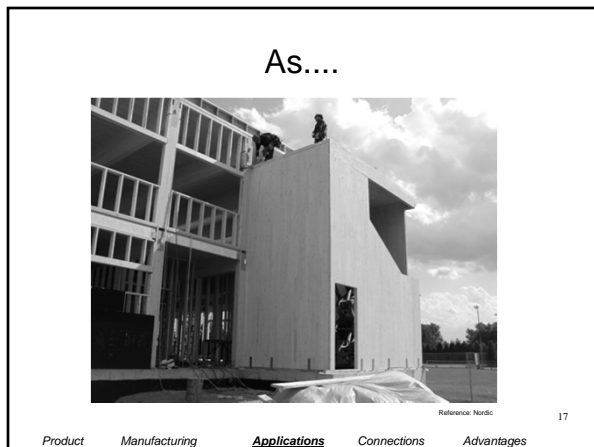
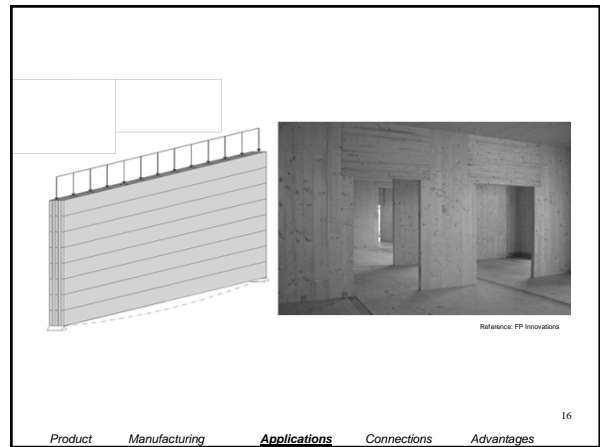
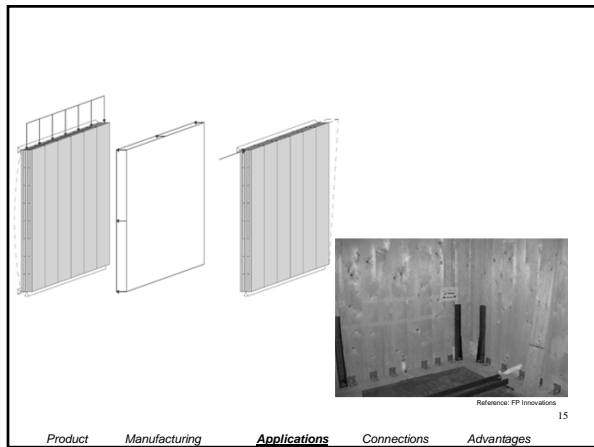
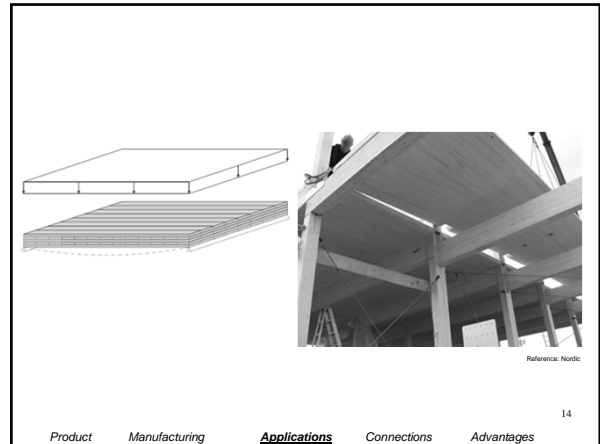
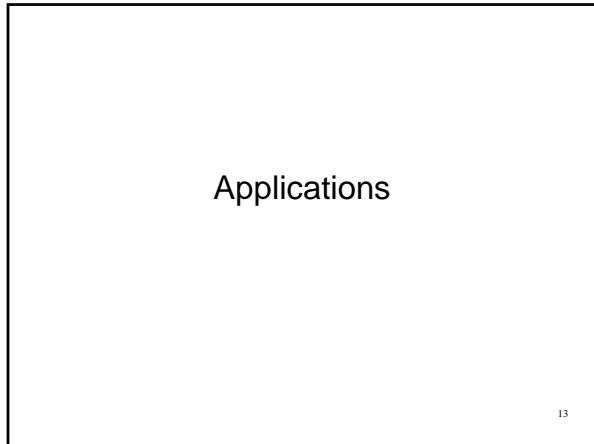
Steps 3 and 4

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Product **Manufacturing** Applications Connections Advantages

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Product **Manufacturing** Applications Connections Advantages



Roof

Reference: TU 清华大学

Product Manufacturing Applications **Connections** Advantages

As....

Reference: Nordic

Product Manufacturing **Applications** Connections Advantages

As....

Reference: Hötzbau Untertalmer

Reference: EPFL, Switzerland

Product Manufacturing **Applications** Connections Advantages

Connections

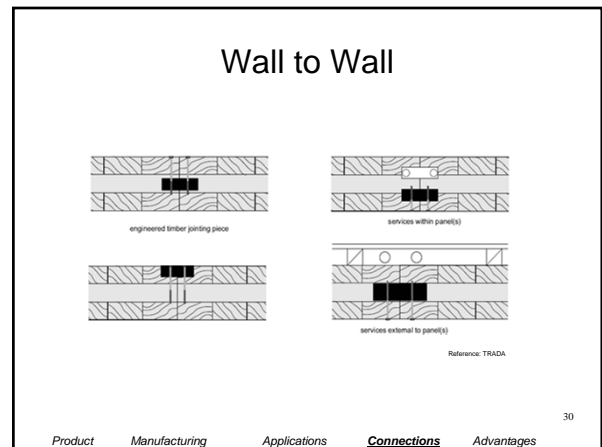
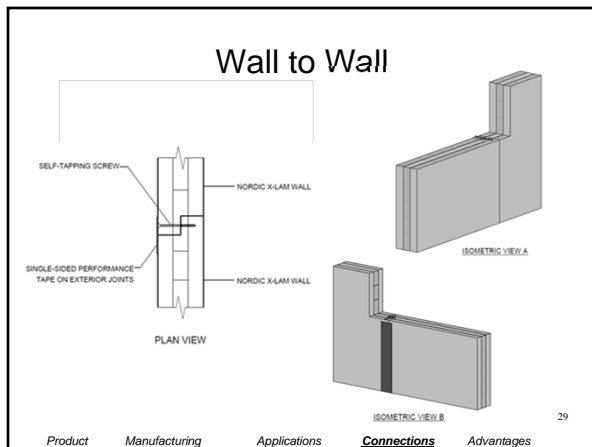
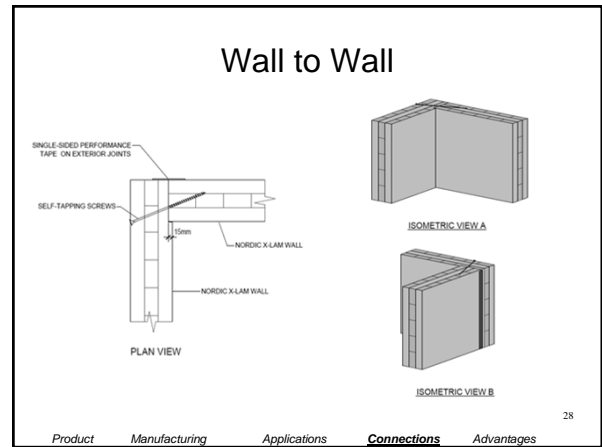
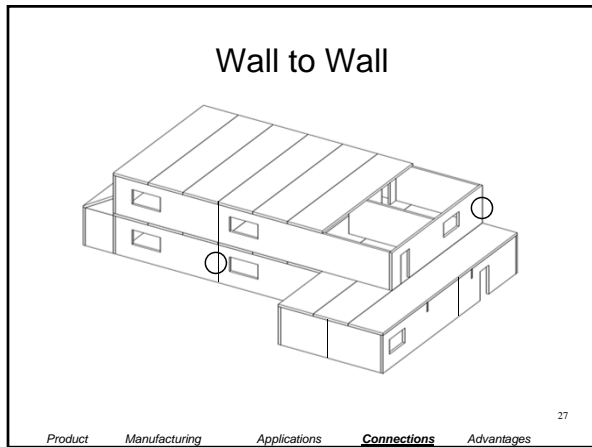
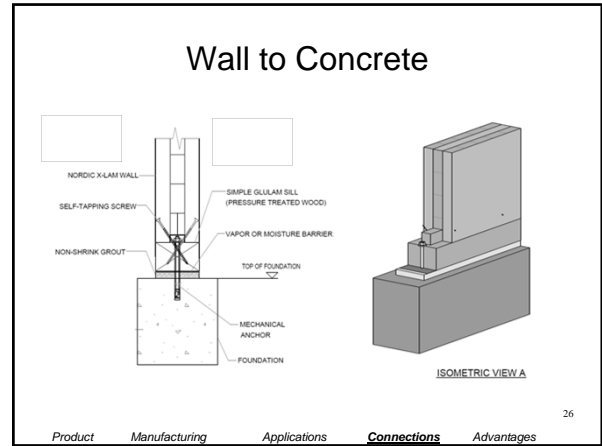
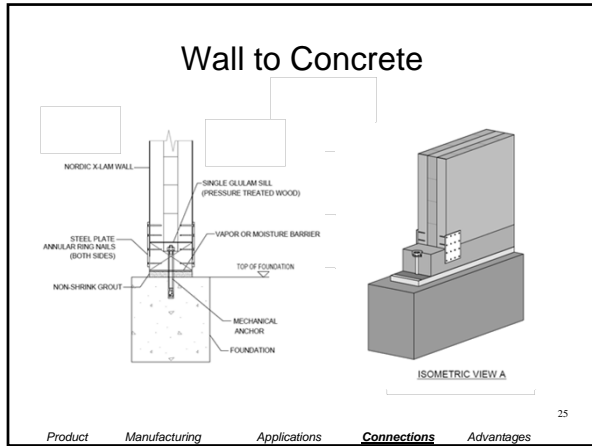
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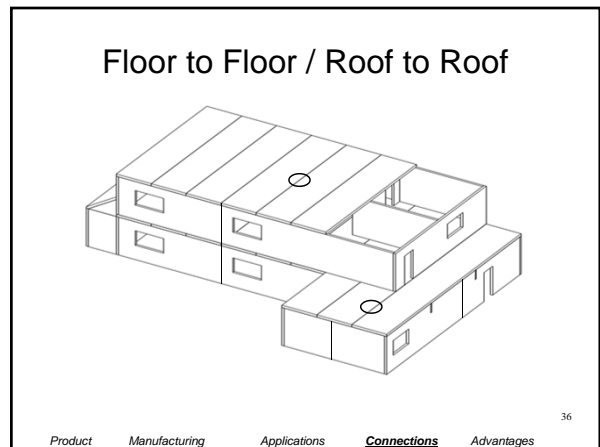
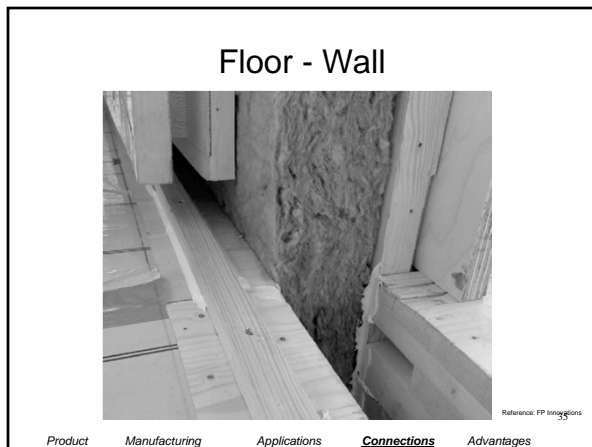
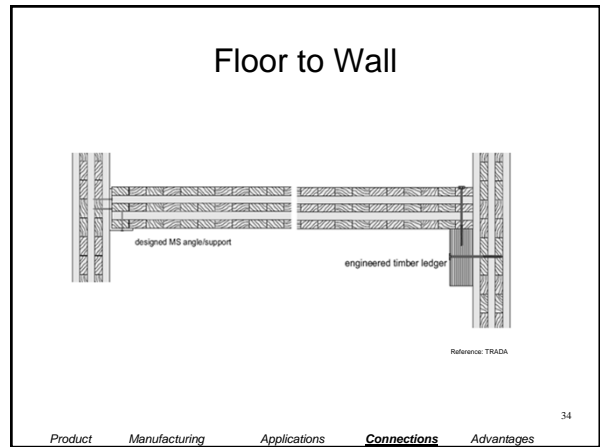
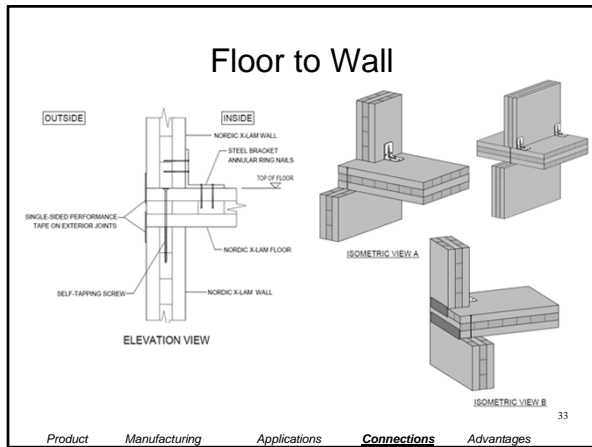
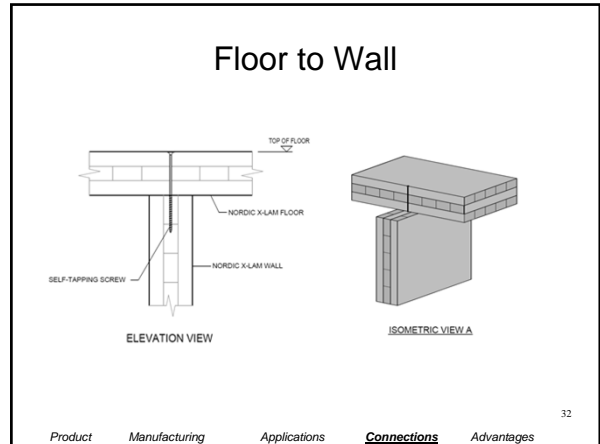
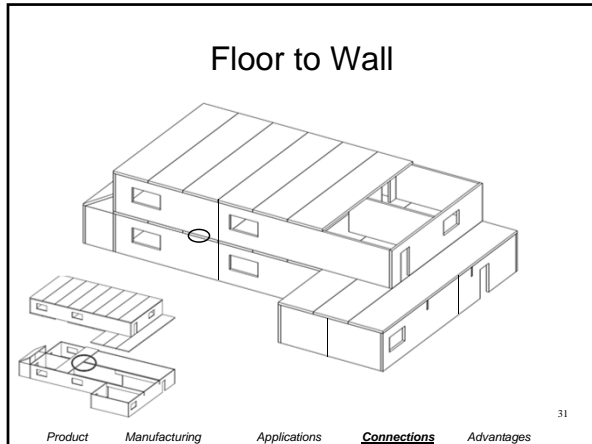
Wall to Concrete

Product Manufacturing Applications **Connections** Advantages

Wall to Concrete

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

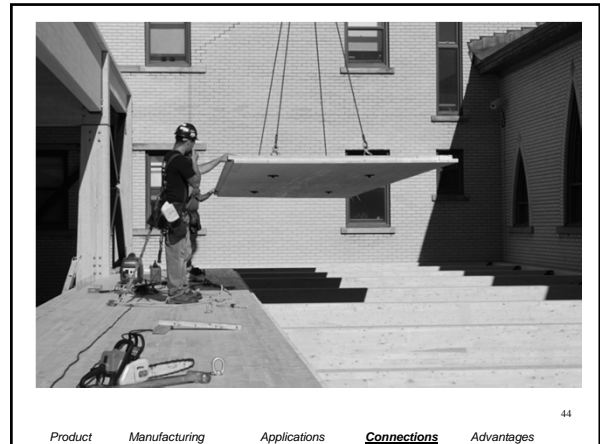
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Product Manufacturing Applications **Connections** Advantages



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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

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Product Manufacturing Applications **Connections** Advantages

Advantages

Table 1: Span and height capabilities of mainstream structural materials in multi-storey buildings

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

Reference: TRADA

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

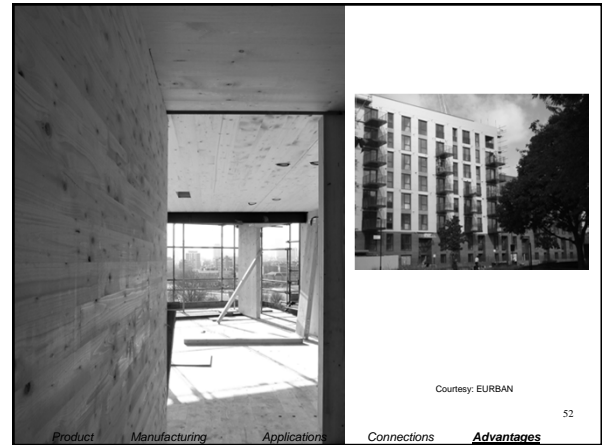
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Product Manufacturing Applications Connections **Advantages**



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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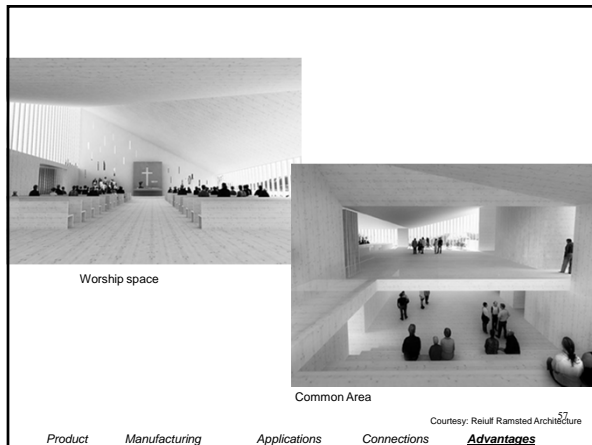
Product Manufacturing Applications Connections **Advantages**

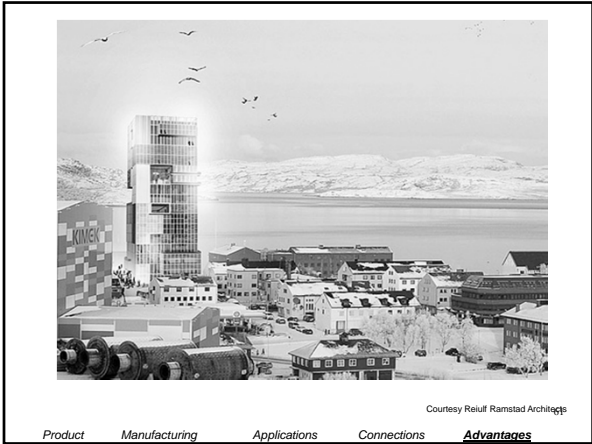


Courtesy: Alex de Ruijck-dimm

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Product Manufacturing Applications Connections **Advantages**





THANK YOU



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The slide features a large, bold 'THANK YOU' message centered between two horizontal lines. Below this, on the left side, is the 'NORDIC' logo, which includes a stylized house icon above the word 'NORDIC' and 'NORDBUILDING' in smaller text below. To the right of the logo is the website address 'www.nordicewp.com'. In the bottom right corner, the number '62' is displayed.