Presentation of Novenco
Application Areas

- **Land:**
  - Office buildings, schools and universities
  - Hospitals, churches
  - Shopping mall
  - Nursing homes
  - Industrial buildings

- **Marine:**
  - Offshore
  - Navy
  - Cargo vessels
  - Yachts
  - Ferries etc.
Previous Novenco Land projects

- Sea west 10000m²
- SEB bank 36000m²
- Mikado house 32000m²
- Office Building 29000m²
- Hospital 3000m²
- Shopping Centre 5000m²

Since 2005 Novenco land projects have increased in popularity and in application from office buildings to hospitals in Denmark, UK, Italy, Norway, Iceland and Finland.
Why is Water Mist popular?

- Recognised by local authorities
- Environmentally friendly
- Reduces Fire and Water damage
- Time and cost efficient
  - Low installation and maintenance costs due to press fitting and few nozzles
- Saves space
  - Smaller dimension of pipes
  - Leaves space for other ceiling installations such as ventilation and cables.
  - Smaller sprinkler rooms - smaller pump units
- Requires less water
  - Smaller water tank
- Aesthetically appealing
  - Concealed nozzle
  - Protective nozzle cover of any colour to match ceiling
Dtek is one of the installation companies that Novenco have used in the recent projects shown before. Dtek is one of the leading installation companies in Denmark and here to talk more about it and the Novenco system is Anders Sindal who is the owner of Dteka dn is also a chairman of Danish Sprinkler section.

Marie Karlsson; 07.09.2009
Anders Sindal Kristensen

- Owner of Dtek
- Chairman of Danish Sprinkler section
- Sprinkler certified engineer
Dtek- Danish Technical Enterprise

- DTEK A/S employs about 150 people located in Copenhagen, Århus, Aalborg and Støvring.
- DTEK A/S has experience in mechanical and sprinkler installation.
- DTEK has co-operated with Novenco on several projects in 2007 ranging from nursing homes to office buildings one of the projects underway is Mikado house.
Advantages of the Novenco Xflow ®System

- Simple Reliable system
- Low system cost (Pipe, sprinklerroom)
- Time efficient installation
- Larger area of nozzle coverage
- Smaller pipe dimensions
- Standard components
- Saves up to 50% of water usage-
  - F.ex. 1600l/min conventional vs. 700l/min Novenco water mist system
- Press fitting- Easier maintenance
- Architecturally appealing – concealed sprinkler
Covers – Architecturally appealing solution

- The nozzle is covered by a cover to avoid damage or unintended release.
- The cover is available in several colors.
- A visually appealing solution in which the nozzle is integrated in the ceiling.
As you can see water mist is the optimal choice and Dtek have therefore decided to move forward in installing it in the mikado project. Before installation can commence Dtek must first seek approval from local authorities and DBI. the procedure- next slide

Marie Karlsson; 07.09.2009
XFlow® Nozzles

- **NHP18A**, spacing 5x5m
  Water consumption per nozzle: 40 l/min. at 4 bar, K=20

- **NHP2**, spacing 2x2m
  Water consumption per nozzle: 5 l/min at 7 bar, K=1,9

- **NHP4**, spacing 3x3m
  Water consumption per nozzle: 12.93 l/min at 7,7 bar, K=4,66

- **NHP9**
  Water consumption per nozzle: 27 l/min at 9 bar, K=9
## Sprinkler versus Water Mist

<table>
<thead>
<tr>
<th></th>
<th>Conventional Sprinkler System</th>
<th>Water Mist System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressure at Nozzle</strong></td>
<td>0.5 bar</td>
<td>4 bar</td>
</tr>
<tr>
<td><strong>Way of extinguination</strong></td>
<td>Cooling</td>
<td>Cooling and Oxygen suffocation</td>
</tr>
<tr>
<td><strong>System configuration</strong></td>
<td>Difficult</td>
<td>Simple</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Water consumption</strong></td>
<td>5 l/min/m²</td>
<td>1.6 l/min/m²</td>
</tr>
<tr>
<td><strong>Pipe size</strong></td>
<td>Large</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Recommended Pipe material</strong></td>
<td>Steel</td>
<td>Stainless steel, Galvanized coated pipes</td>
</tr>
<tr>
<td><strong>Working Pressure</strong></td>
<td>&lt; 10 bar</td>
<td>&lt;16 bar</td>
</tr>
<tr>
<td><strong>Fitting</strong></td>
<td>Sprinklerfitting</td>
<td>Pressfitting</td>
</tr>
<tr>
<td><strong>Max. Areal coverage pr. sprinkler</strong></td>
<td>12m²</td>
<td>25m²</td>
</tr>
<tr>
<td><strong>Installation time pr. m²</strong></td>
<td>6.6 minutes/m²</td>
<td>3.25 minutes/m²</td>
</tr>
</tbody>
</table>
Project: Mikado House

- Located in Ørestad, Copenhagen
- 32000m²
- 6-storey Office building with atrium.
- Novenco Water Mist system installed by Dtek.
Convince change of system with consulting firm and or Architect

Consulting firm makes changes in Fire report.

Local authorities review fire report for eventual approval under conditions that DBI will perform the final inspection

Confirmation for water mist = Installation can commence after manufacture guidelines
System manufacture make design and installation guidelines.

DBI inspect system for final approval.
Fitting of the Water mist system has to undergo the following procedure:

1. Contact architect and or consulting firm in order to convince them that the water mist system is in the best interest of the building/project.
2. When the firm is convinced they make changes in the fire report- the fire report is a detailed fire analysis of the building- includes: technical drawing of the building, Escape routes, fire simulations and tests etc.
3. When the fire report is done, it is sent to the local authorities for approval under the condition that when installed, it will undergo DBI final inspection. This is an ongoing process and changes can be made until an approval is acquired.
4. When approval of fire report is acquired the installation can commence. Installation must be implemented under certain specifications. These specifications are given by the watermist manufacturer. The specification contains datasheets, instruction manuals and installation guidelines of the system.
5. When installation is complete, DBI inspects the system for approval. The system MUST follow Danish standard approvals and guidelines.

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Installation of system

- System must be approved for Inspection by:
  - DBI
  - Local authorities
- System must fulfill DBI 251/4001 guidelines.
- News folder 07/2009
  - Water Mist Systems for Buildings-DBI
- Installation implemented by qualified personnel
  - Certified personnel under– DBI guideline 001, and 002
Supply Line for Nozzle

■ DN15 connection

■ Concealed sprinkler with flex pipe
Main Line

Main Pipe DN 50
Atrium solution
Sprinkler Room

Pump and Control panel in sprinkler room
With installation complete and all components in place, the only thing remaining is the Final inspection that is implemented by DBI. And to inform you more on DBI is Ander Frost-Jensen director of Services at DBI.

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100 sprinklers/Loop system

- Sprinkler spacing
- Max 3,5 x 3,5 m
- A=12 m²
48 nozzles NHP 18A

- Nozzle spacing
- Max 5 x 5 m
- A=25 m²
## Price, Sprinkles vs. Water Mist

### Sprinklersystem
- **Costprice, loopsystem**: dkr. 98.000,-
- **Installationtime**: hrs. 132
- **Sprinklerhead**: pcs. 100
- **Min/m2**: 7,2
- **More blue men, lift, tool**

### Low watermistsystem
- **Costprice, loopsystem**: dkr. 62.500,- (87.000,-)
- **Installationtime**: hrs. 65
- **Sprinklerhead**: pcs. 48
- **Min/m2**: 3,85
- **Less blue men, lift, tool**
Anders Frost-Jensen

Director of inspection and investigation services
Danish Institute of Fire and Security Technology
DBI - The Danish Institute of Fire and Security Technology

- DBI - a knowledge centre in the field of security and fire safety
- Denmark's leading knowledge centre in the field of fire safety and prevention. We maintain our knowledge through relevant participation in research and development activities and services that we offer private and public enterprises, institutions and authorities.
Standardisation of watermist

- Increased popularity → need for standardization
  - Changing from sprinklersystems to watermist-systems need a approval from authorities

- Mist system
  - Water mist is like sprinkler and must uphold specific demands on energy and water flow, operation and maintenance

- New standard implementation of guidelines 2010
  - Mist guidelines 254
System Approvals in Denmark

APPROVAL STANDARDS

- VdS
- DBI – Danish Institute of Fire and Safety Technology
- FM Global
- UL
- Approval from Marine classifications
Inspection requirements

- Executed by accredited Inspection company
- Approval from DBI and local fire authorities
- Yearly inspections
- Inspected after DBI Guideline 004

- "Automatiske brandsikrings- anlæg - færdigmelding, inspektion og godkendelse"