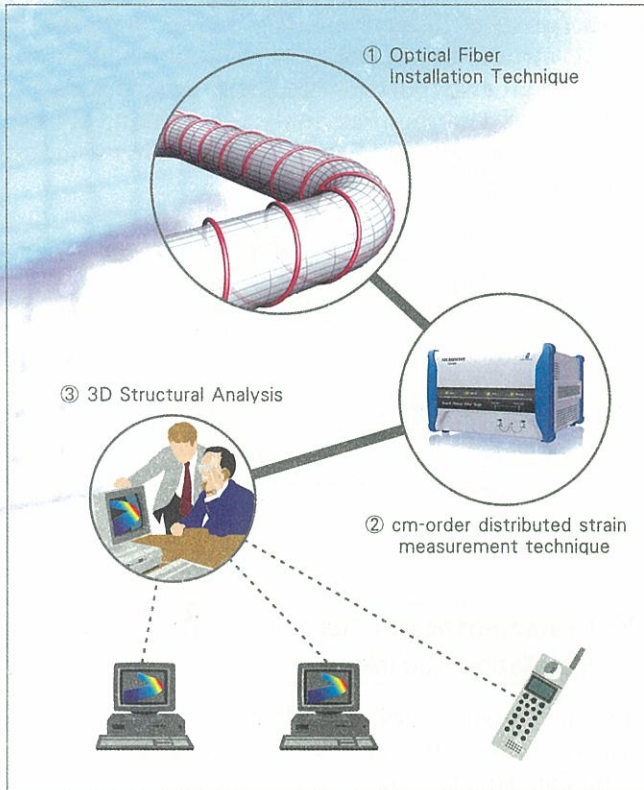


Structural Health Monitoring System



The Neubrex Structural Health Monitoring System (SHMS) combines:

1. measurements of temperatures and strains at remote location
2. highest spatial resolution and accuracy*
3. 3D structural analysis tools

to monitor and assess the state of the structure. The structural simulation assists engineers in preventing both structure failure and accidents, further leveraging the costs of deployment. The cm-order spatial resolution, high accuracy of the measurements (never realized simultaneously before) reliability and stability, make the Neubrex SSMH a powerful diagnostic tool for assessment of localized hazards.

* On the market today (Source: Neubrex, internal testing, Oct 2004)

NEUBREX TECHNOLOGIES

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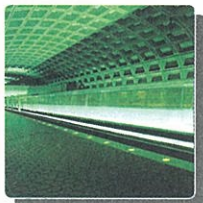
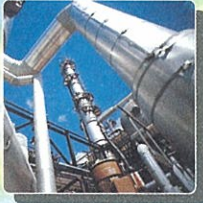
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Give you a feel

The Neubrex cutting-edge Structural Health Monitoring System delivers the most advanced distributed sensing system on the market. With extreme accuracy and innovative analysis, the system offers the highest spatial resolution (up to 10 cm) ever available for use in a broad range of applications including:



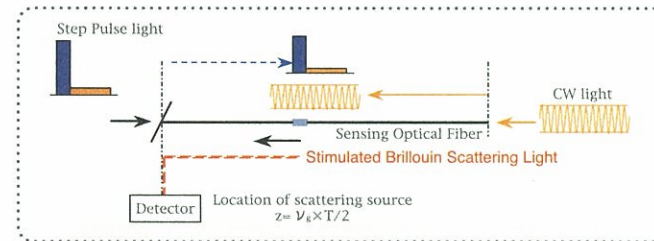
- Energy industry
(pipelines, pressure vessels, technological systems)
- Transport
(railroads, ships, airplanes)
- Civil infrastructure
(bridges, tunnels, dams)

Features of Strain Measurement Technique

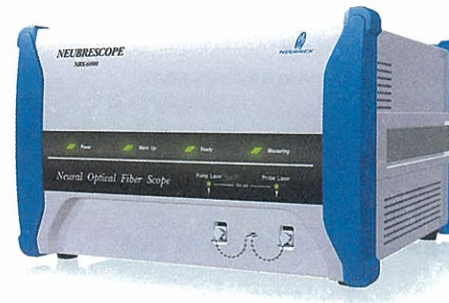
Neubrex technology provides tools for detecting even the smallest deformations, caused by cracks or fatigue, untraceable up to now by existing measuring techniques.

- Behind the scene :
Pulse-PrePump Brillouin Optical Time Domain Analyzer (Pulse-PrePump BOTDA)
- Accuracy of strain measurement : $\pm 0.0025\%$ ($\pm 25 \mu \epsilon$)
- The highest spatial resolution ever available :
less than 10cm
- High accuracy of temperature measurement : $\pm 1^\circ \text{C}$
- Distance range : up to 20km
(with spatial resolution of 1 m)
- Simultaneous measurement of strain and temperature

Working principle of PPP-BOTDA

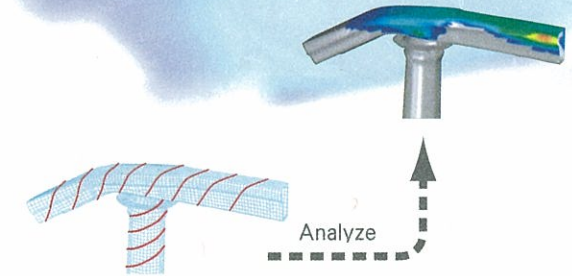


Measuring Device : NEUBRESCOPE®



3D Structural Analysis

The accuracy of measurements combined with the full 3D structural analysis gives you an insight into the internal distribution of temperatures, strains, and stresses. The Neubrex analysis technique allows you to monitor and predict failures in many technological systems.



Characteristics of Zipper-Style Optical Fiber Installation Technique

The zipper-style optical fiber installation technique ensures trouble-free installation, substantially shortening deployment time.

<Features of Optical Fiber Sensing>

- measurement in inaccessible locations and/or severe environment conditions
- distributed measurements along the fiber
- explosion-safe
(can be directly installed in the flammable liquids/gases)
- temperature range : $-50 \sim +500^\circ \text{C}$
- temperature compensation no longer required
- insensitive to interference from electromagnetic wave/lightning/electric power surge
- can be simultaneously used in telecommunication technology
- long-term stability and durability