

Structural Analysis & Design Software





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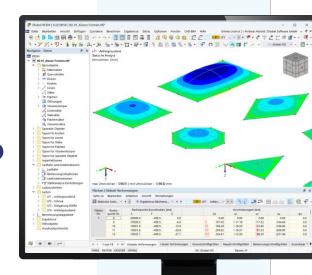
Product Engineering & Customer Support Dlubal Software GmbH



Dipl.-Ing. (FH) Jürgen Theilmann, M.Eng.

Customer Support Dlubal Software GmbH Webinar

Form-Finding and Calculation of Pneumatic Membrane Structures in RFEM 6





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Questions During the Presentation

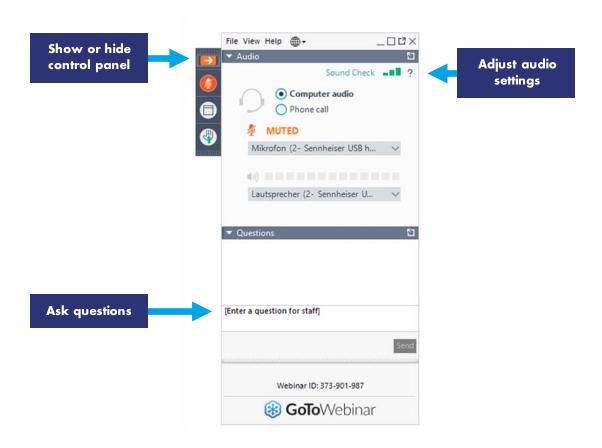


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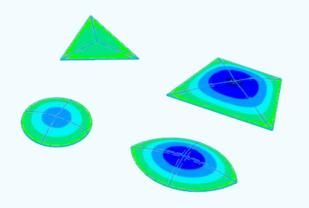


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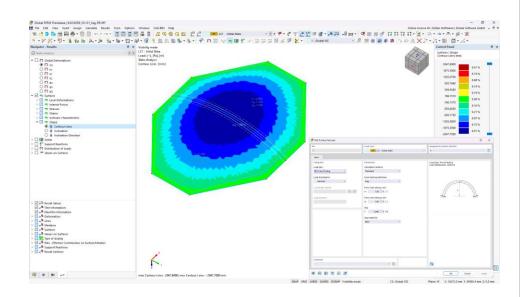
- O2 Modeling of a pneumatical system
- O3 Wind Analysis and generation of wind loads
- O4 Design of the supporting structure
- 05 Prospect





Overview

- Surface Load Sag (pre-release version)
- Ponding Load (pre-release version)
- Difference Results
- Set of members Loads





Reference Example

Beispiel 3.8

Es wird ein Folienkissen mit einer Spannweite von 4 m und einer Länge von 12 m betrachtet, und für die Berechnung der Spannungen und Verformungen wird in der Mitte des Kissens ein Streifen mit 1 m Breite herausgeschnitten. Mit einer geringen Spannung in Richtung der langen Seite ist der mittlere Bereich einachsig gekrümmt und weist einen homogenen und anisotropen Spannungszustand auf, vgl. Abb. 2-107.

Das Eigengewicht der Membran mit ca. 0,01 kN/m² wird für die nachfolgenden Berechnungen vernachlässigt. Die Windbelastung wird vereinfachend als konstant über die Breite angenommen, zum Beispiel für ein Kissen aus dem mittleren Bereich einer größeren Dachfläche. Sehnee und Windbelastungen gelten für Karlsruhe unter 400 m. ü. NN.

Charakteristische Einwirkungen

Innendruck $p_{i,k} = 0.3 \text{ kN/m}^2$

Schnee $s_k = 0.52 \text{ kN/m}^2$

Windsog $w_{s,k} = -1.2 \cdot 0.65 \text{ kN/m}^2$

 $= -0,78 \text{ kN/m}^2$

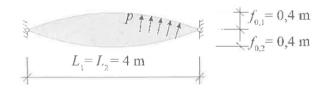


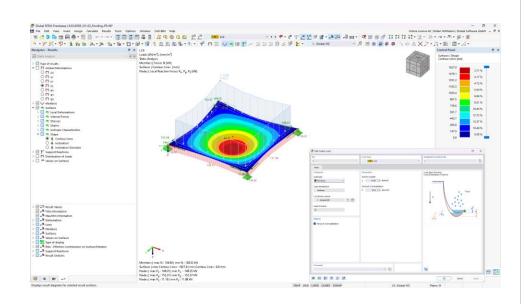


Abb. 3-230: Geometrie und Belastung

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Prospect

- Release of Surface Load Sag
- Release of Ponding Load
- Development of Cutting-Patterns







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