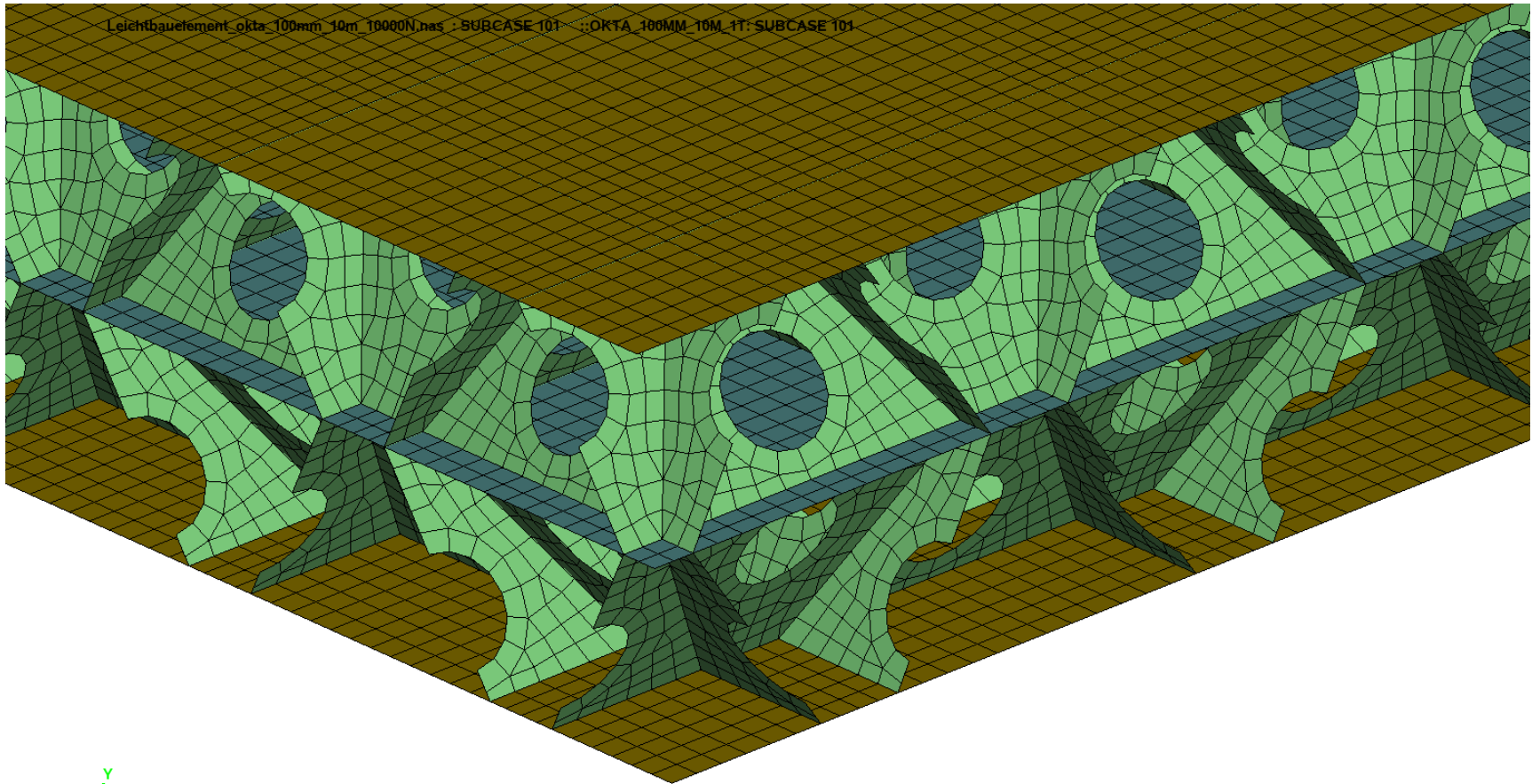


LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Modelaufbau



LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Modelaufbau

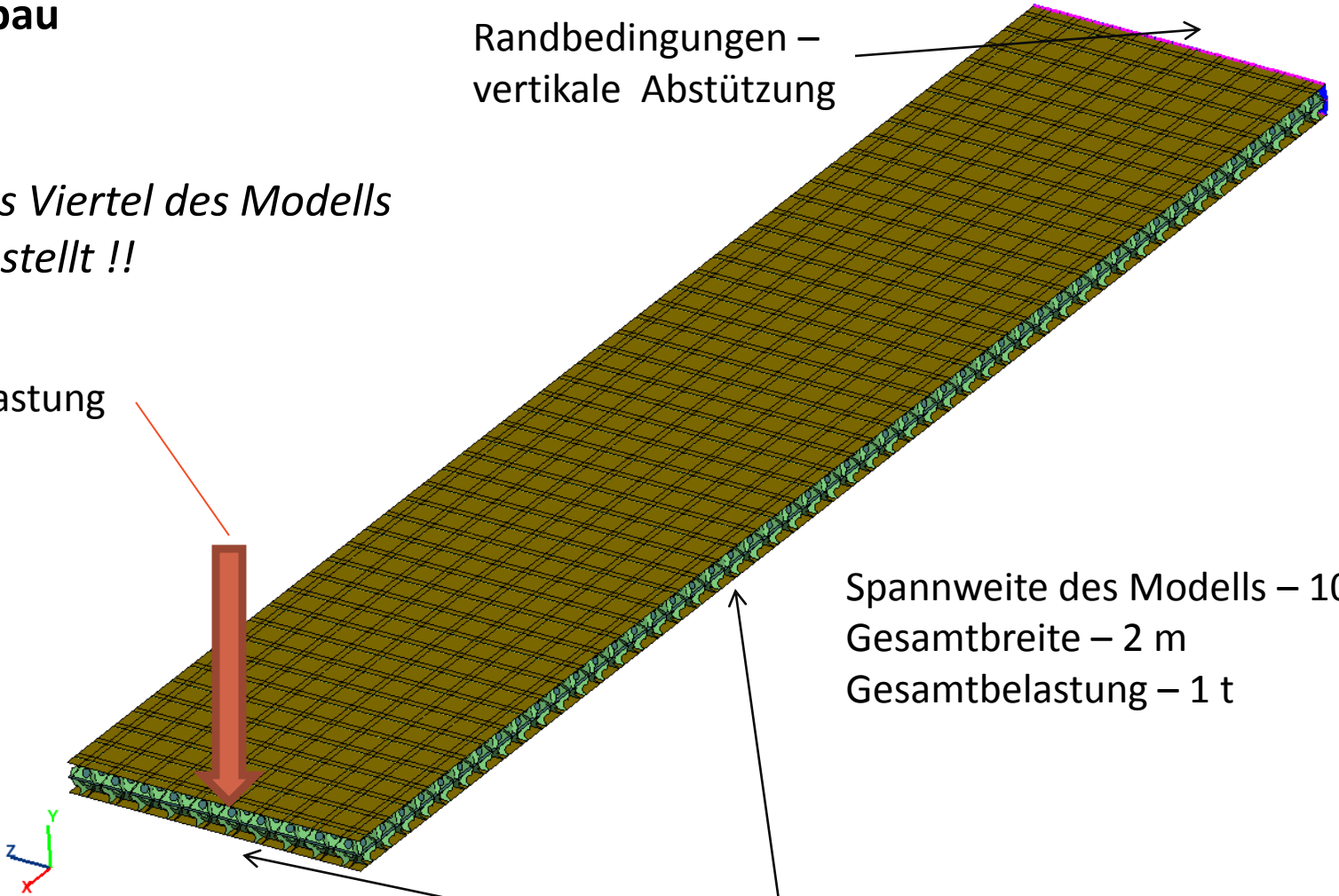
!! nur das Viertel des Modells ist dargestellt !!

Linienbelastung

Randbedingungen –
vertikale Abstützung

Spannweite des Modells – 10 m
Gesamtbreite – 2 m
Gesamtbelastung – 1 t

Symmetrischerandbedingungen



LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Modelaufbau

Material: 2024T351

$E = 72\,000\text{ MPa}$

$R_m = 420\text{ MPa}$

$R_{p02} = 290\text{ MPa}$

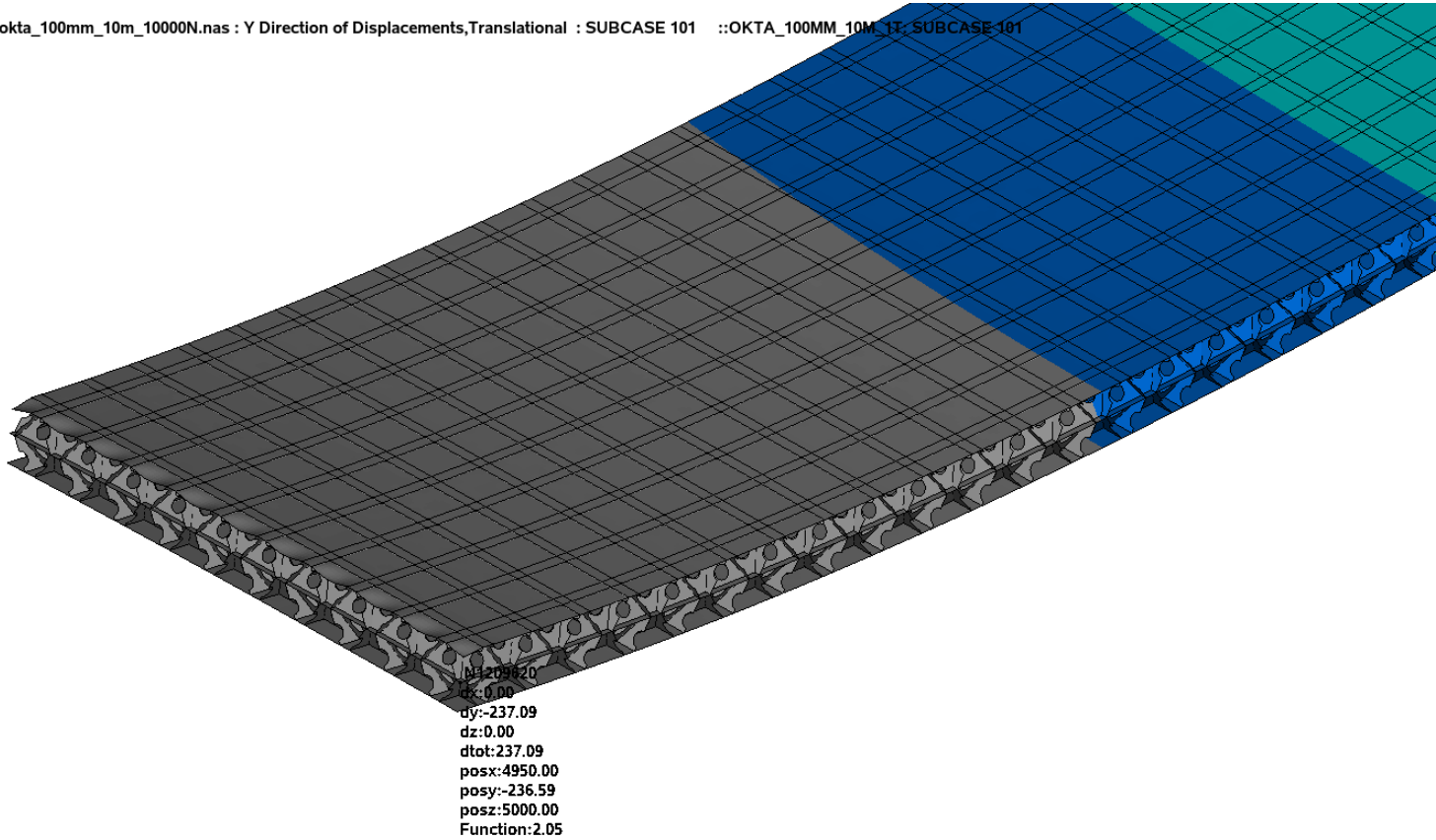
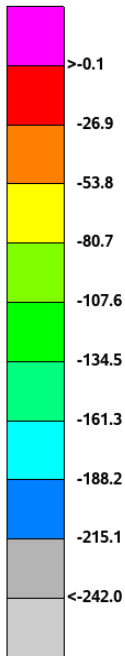
$\rho = 2.75\text{ t/m}^3$

LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Ergebnisse

Verformungen

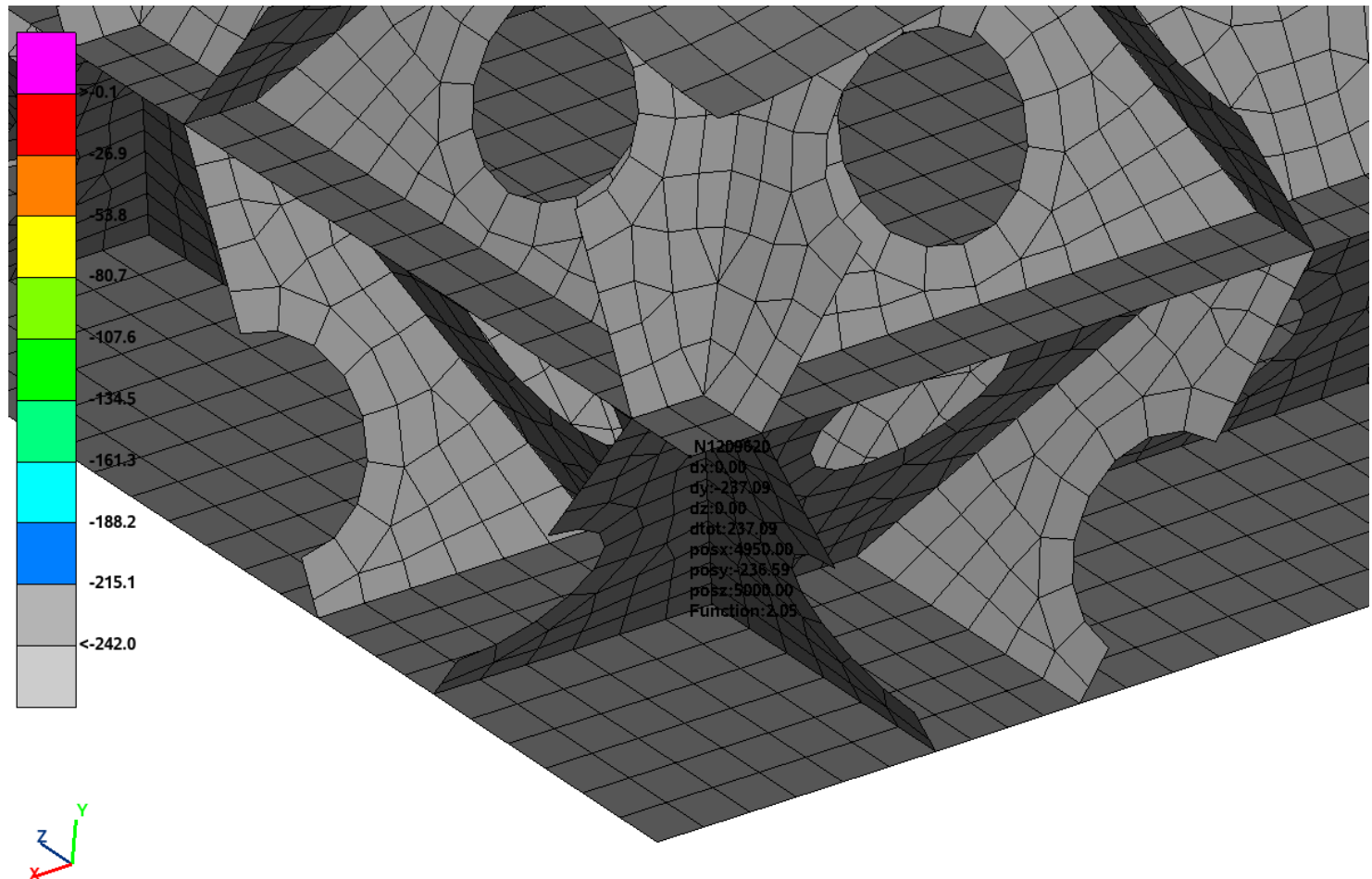
Leichtbauelement_okta_100mm_10m_10000N.nas : Y Direction of Displacements, Translational : SUBCASE 101 ::OKTA_100MM_10M_1T: SUBCASE 101



LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Ergebnisse

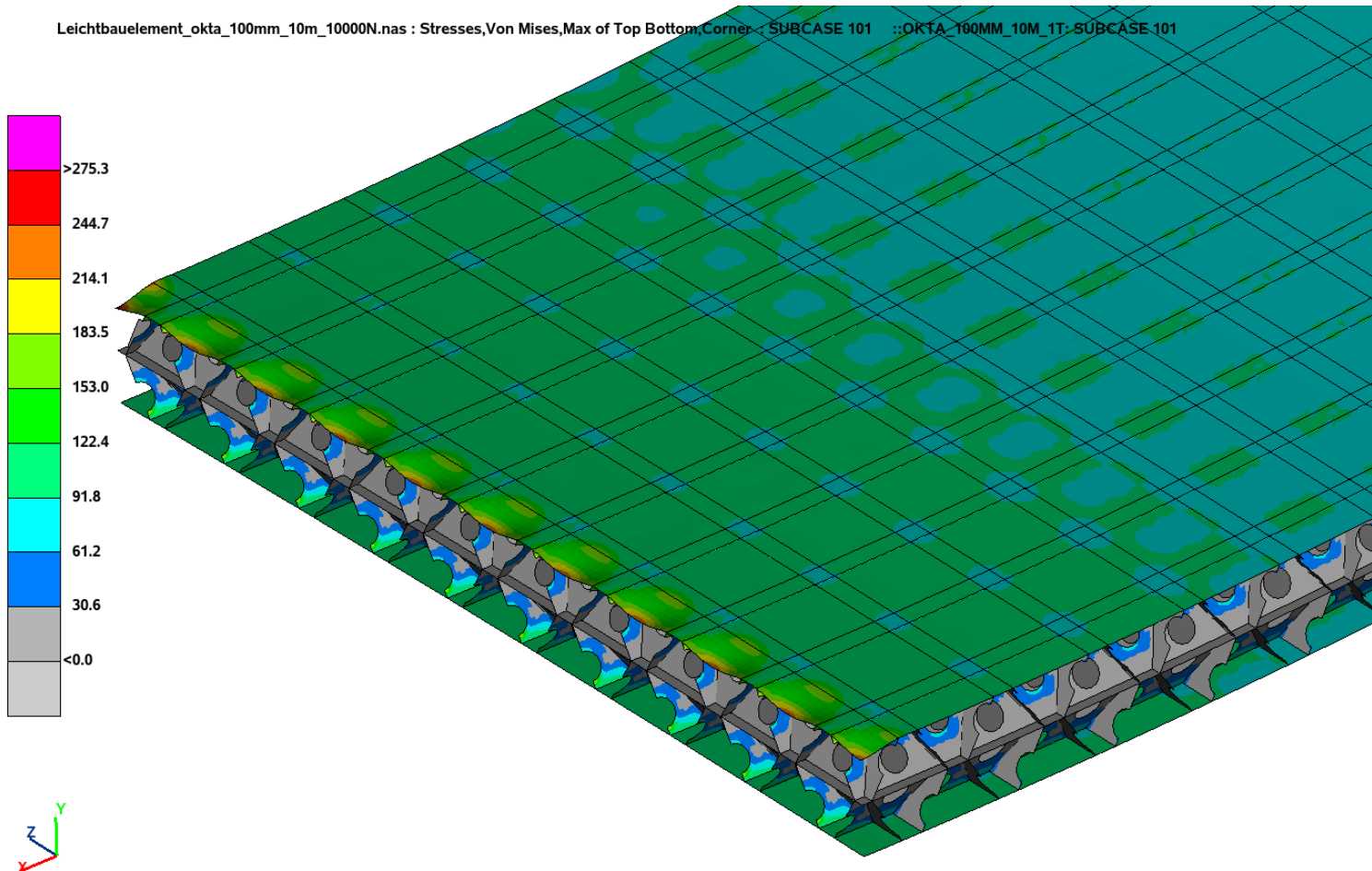
Verformungen – 237 mm



LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Ergebnisse

Spannungen – Von Mises



LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Ergebnisse – analytische Berechnung

Dimension of the cell

Oktaeder cell height	$l_o =$	100	mm
Basic cell height	$l =$	50.0	mm
Face sheet thickness	$t_s =$	1.0	mm
Web thickness	$t_w =$	1.0	mm
Middle plate thickness	$t_m =$	1.0	mm
Hole position	$r =$	20	mm
Hole diameter	$d =$	26	mm
Web angle	$\alpha =$	59.01	deg

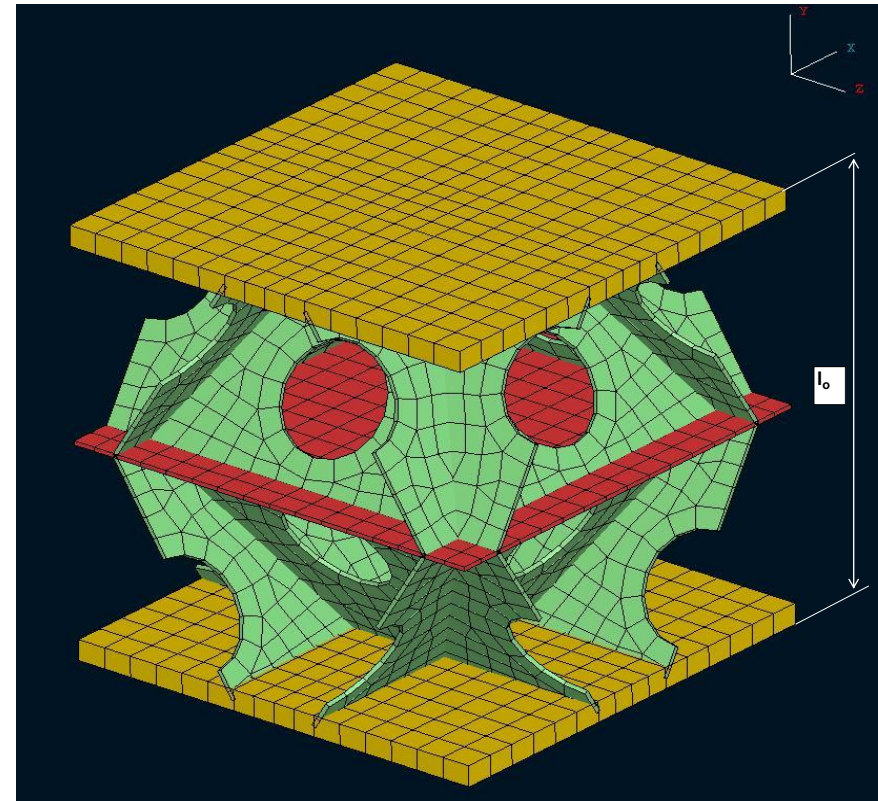
Cross section area	$A_{\text{cell}} =$	422	mm ²
Moment of inertia	$I_{x_{\text{cell}}} =$	6.364E+05	mm ⁴

Dimensions of the panel

Length	$a =$	10000	mm
Width	$b =$	2000	mm

Moment of inertia	$I_x =$	1.273E+07	mm ⁴
Minimal bending modulus	$W_x =$	254551	mm ³
Cross section area	$A =$	8446	mm ²
Panel material volume	$V =$	0.1089	m ³

Approx. panel weight	$m =$	299.5	kg
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Material

Name	2024 T351
Young modulus	$E =$ 72000 MPa
Yield stress	$R_{p02} =$ 290 MPa
Density	$\rho =$ 2.75 t/m ³

LEICHTBAUELEMENT – OKTAEDERPLATTE 100 / 1 mm

Ergebnisse – analytische Berechnung

Simply supported beam

Center load	P =	1000	kg
Maximal deformation	w =	227.3	mm
Maximal bending moment	M =	25000	Nm
Max/min stress on the faces	σ =	98.2	MPa

Solid beam of equivalent stiffness

Height:	42.4	mm
Weight:	2333	kg