simulation and analysis

Business service

- Analysis and documentation

Project description

Strength analyses and simulations to the applicable standard are permanent works during product development.

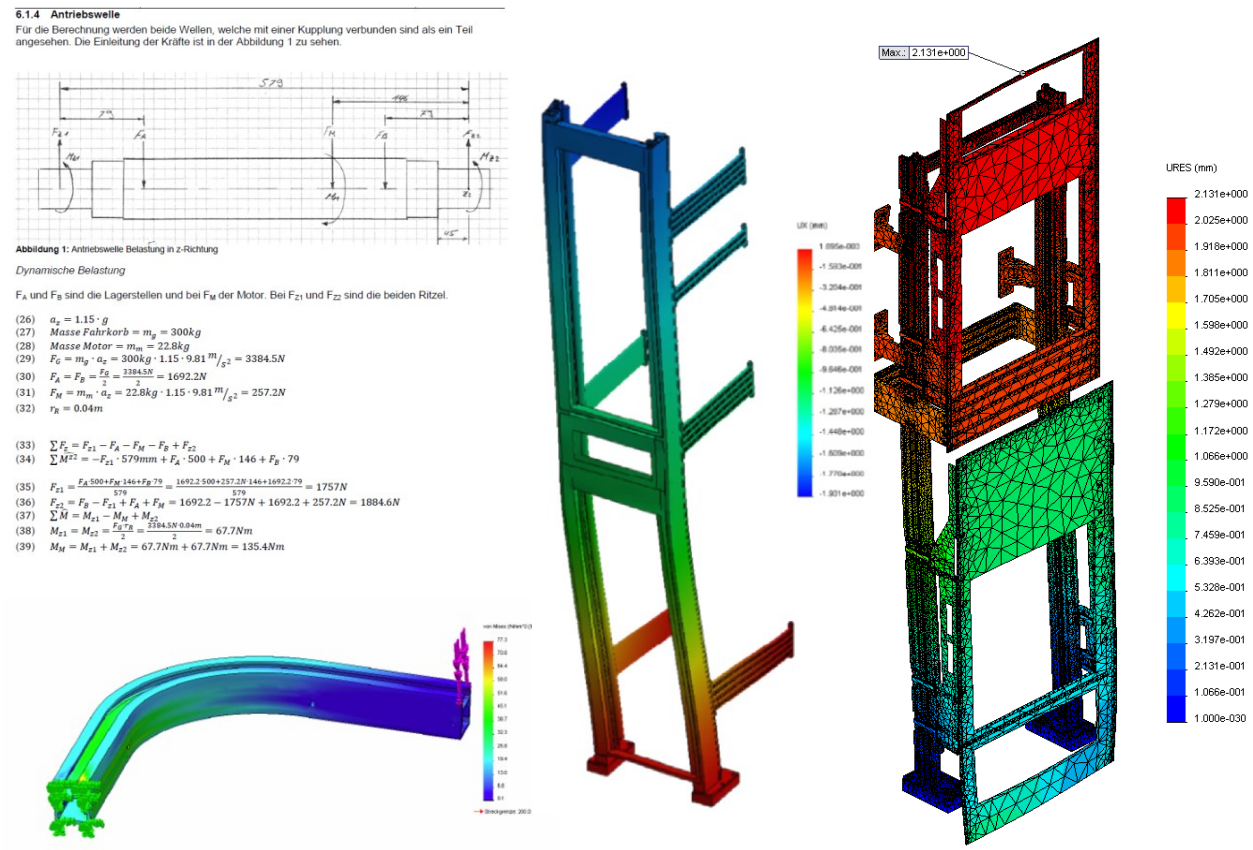
Specification

- various guidelines and standards

«simplify» solution

- Simultaneous constructing and calculating
- use smart CAD software

Status: Simulations are constant work during the product development



6.1.4 Antriebswelle

Für die Berechnung werden beide Wellen, welche mit einer Kupplung verbunden sind als ein Teil angesehen. Die Einleitung der Kräfte ist in der Abbildung 1 zu sehen.

Abbildung 1: Antriebswelle Belastung in z-Richtung

Dynamische Belastung

F_A und F_B sind die Lagerstellen und bei F_M der Motor. Bei F_{z1} und F_{z2} sind die beiden Ritzel.

(26) $a_z = 1.15 \cdot g$
(27) $Masse\ Fahrkorb = m_y = 300kg$
(28) $Masse\ Motor = m_m = 22.8kg$
(29) $F_G = m_y \cdot a_z = 300kg \cdot 1.15 \cdot 9.81\,{}^{m}/_{s^2} = 3384.5N$
(30) $F_A = F_B = \frac{F_G}{2} = \frac{3384.5N}{2} = 1692.2N$
(31) $F_M = m_m \cdot a_z = 22.8kg \cdot 1.15 \cdot 9.81\,{}^{m}/_{s^2} = 257.2N$
(32) $r_R = 0.04m$

(33) $\sum F_z = F_{z1} - F_A - F_M - F_B + F_{z2}$
(34) $\sum M^{22} = -F_{z1} \cdot 579mm + F_A \cdot 500 + F_M \cdot 146 + F_B \cdot 79$

(35) $F_{z1} = \frac{F_A \cdot 500 + F_M \cdot 146 + F_B \cdot 79}{579} = \frac{1692.2 \cdot 500 + 257.2N \cdot 146 + 1692.2 \cdot 79}{579} = 1757N$
(36) $F_{z1} = F_B - F_{z1} + F_A + F_M = 1692.2 - 1757N + 1692.2 + 257.2N = 1884.6N$
(37) $\sum M = M_{z1} - M_M + M_{z2}$
(38) $M_{z1} = M_{z2} = \frac{F_B \cdot r_R}{2} = \frac{3384.5N \cdot 0.04m}{2} = 67.7Nm$
(39) $M_M = M_{z1} + M_{z2} = 67.7Nm + 67.7Nm = 135.4Nm$

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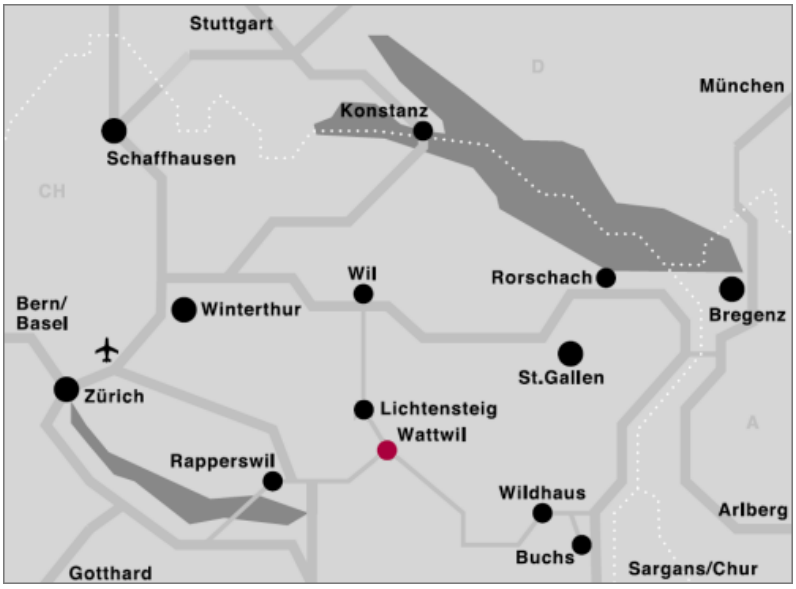

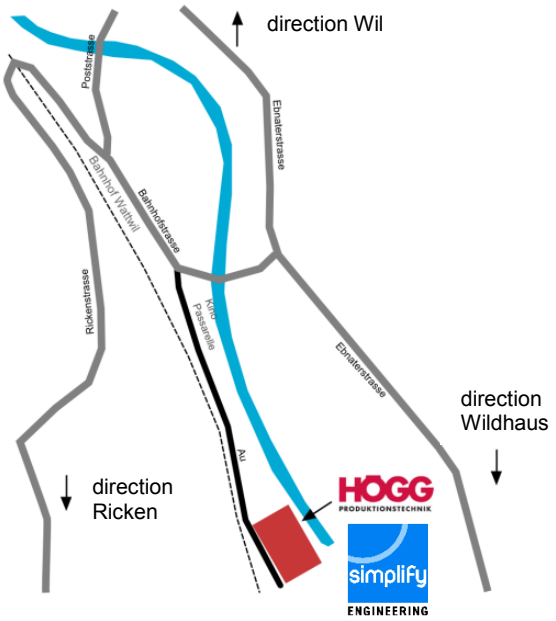

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