

Stress assessment for the updated DQW crab cavity

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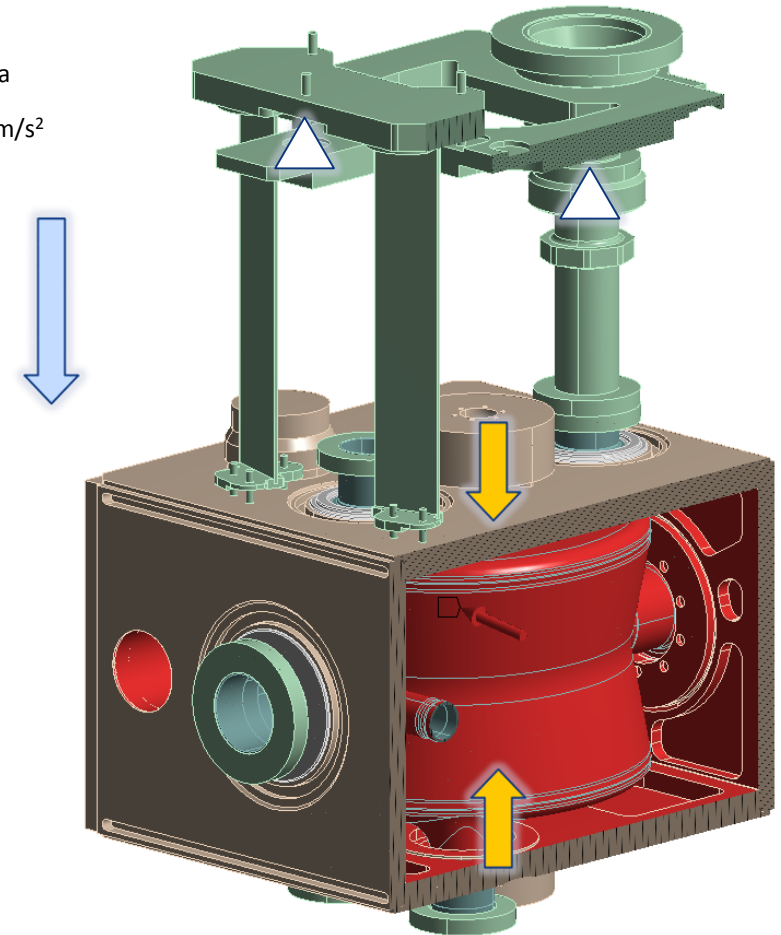
ENGINEERING
DEPARTMENT

Material

According to Konrad Eiler, the yield strength for Niobium is **88 MPa**. Therefore the plastic analysis is not required, since the cavity will operate in the elastic zone.

BCs and loads

- △ Fixed support
- ↓ Pretuning 0.1 mm
- Pressure 0.18 MPa
- ↓ Gravity 9806.6 mm/s²



Results

Classification line	Stress category	Case	Allowable stress		Calculated stress [MPa]
			[MPa]		
1	P_m	Pressure	f	58	18
	$P_m + P_l + P_b$		$1.5f$	88	57
	$\Delta(P+Q)$	Pressure + Tuning	$3f$	174	105
2	P_m	Pressure	f	58	17
	$P_m + P_l + P_b$		$1.5f$	88	55
	$\Delta(P+Q)$	Pressure + Tuning	$3f$	174	97
3	P_m	Pressure	f	58	13
	$P_m + P_l + P_b$		$1.5f$	88	64
	$\Delta(P+Q)$	Pressure + Tuning	$3f$	174	70

