

# Aeronautica 47-500/750 kW Foundation loads

65 m hub height

Wind class: IEC-IIA  
Park configuration

## Extreme loads on foundation (bottom flange of tower):

### Notice!

All extreme loads are **including** a load safety factor of: 1.35

Except for tower and nacelle mass which includes a safety factor of: 0.90

App. nacelle mass kg: 37000

App. tower mass kg: 83000

Total mass incl. safety factor: 120000

### Extreme loads including above safety factors:

Horizontal force [kN]:	440
Bending moment [kNm]:	21668
Vertical force [kN]:	1019
Torsional torque [kNm]:	728

## Equivalent fatigue loads on foundation (bottom flange on tower):

Equiv. load ranges for diff. cycle numbers m - denotes the S/N - curve slope

The following fatigue loads, should be taken into consideration at the same time:

### **Vertical force (FxT):**

N-ref: 2.41E+08

m	N-ref	N=10E7	N=10E6
3	30.58	88.36	190.37
4	29.05	64.39	114.50
6	29.40	49.98	73.36
8	30.88	45.98	61.31
10	32.56	44.77	56.36
12	34.20	44.59	54.02

### **Torsional torque (MxT):**

N-ref: 7.24E+08

m	N-ref	N=10E7	N=10E6
3	195.76	815.93	1757.86
4	214.02	624.30	1110.18
6	251.59	513.64	753.92
8	287.43	490.91	654.64
10	320.17	491.31	618.52
12	349.51	499.39	605.02

### **Horizontal force (Fzh0):**

N-ref: 2.48E+08

m	N-ref	N=10E7	N=10E6
3	31.93	92.29	198.83
4	37.02	82.04	145.90
6	46.91	79.74	117.04
8	55.55	82.70	110.29
10	63.36	87.11	109.67
12	70.73	92.22	111.72

### **Bending (Myh0):**

N-ref: 2.48E+08

m	N-ref	N=10E7	N=10E6
3	1652.86	4776.61	10290.90
4	1959.57	4343.34	7723.67
6	2541.99	4321.32	6342.82
8	3063.19	4560.42	6081.42
10	3552.14	4883.77	6148.31
12	4020.95	5242.63	6351.59

## Lines of direction for stiffness properties of foundation:

The foundation should as a minimum have a stiffness equal to a beam of length 2 meter, fixed in one end and with the minimum stiffness properties:

$$EI: 1.50E+11 \text{ Nm}^2$$