|  |  |
| --- | --- |
| Calculation number / work number | overhead 5-4,5-6 / |
| Rated capacity of crane, [kg] | 5 000 |
| Span, [m] | 4,500 |
| Wheel base, [mm] | 2 000 |
| Rail type / track clearance, [mm] | 40\*30S / 52 |

**Dynamic factors according to EN 13001-2**

|  |  |  |
| --- | --- | --- |
| φ1 | 1,10 | For hoisting and gravity effects acting on the mass of the crane |
| φ2 | 1,19 | For inertial and gravity effects acting on the hoist load |
| φ3 | 1,00 | For sudden release of a part of the hoist load |
| φ4 | 1,00 | Loads caused by travelling on uneven surface |
| φ5,Trolley | 2,07 | For loads caused by acceleration of traversing machinery |
| φ5,Bridge | 2,07 | For loads caused by acceleration of travelling machinery |
| φ6 | 1,10 | Dynamic factor for test loads |
| φ7 | 1,25 | For buffer forces |
| φ8 | 1,10 | Gust response factor |
| ç | 0,00656 | Remaining hoist load |

(Note! Given wheel loads don’t include any dynamic or partial safety factors)

**Vertical wheel loads** (given wheel loads are without dynamic factors)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Load action / Component** | **Wheel1,1** | **Wheel1,2** | **Wheel2,1** | **Wheel2,2** |
| Self weight of the crane (tp1), Fz,i,j | -3,27 kN | -3,46 kN | -2,34 kN | -2,52 kN |
| Self weight of the crane (tp2), Fz,i,j | -2,36 kN | -2,54 kN | -3,25 kN | -3,43 kN |
| Weight of the hoist load (tp1), Fz,i,j | -19,5 kN | -19,6 kN | -5,15 kN | -5,16 kN |
| Weight of the hoist load (tp2), Fz,i,j | -4,05 kN | -4,07 kN | -20,6 kN | -20,7 kN |
| Dynamic test load (tp1), Fz,i,j | -21,4 kN | -21,5 kN | -5,66 kN | -5,68 kN |
| Dynamic test load (tp2), Fz,i,j | -4,46 kN | -4,47 kN | -22,6 kN | -22,7 kN |

(tp1 = Trolley position closest to Rail 1, tp2 = Trolley position closest to Rail 2)

**Horizontal wheel loads** (given wheel loads are without dynamic factors)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Load action / Component** | **Wheel1,1** | **Wheel1,2** | **Wheel2,1** | **Wheel2,2** |
| Acceleration of the crane bridge (tp1), Fx,i,j | -0,659 kN | 0,659 kN | -0,218 kN | 0,218 kN |
| Acceleration of the crane bridge (tp1), Fy,i | Total longitudinal force on Rail 1 = -0,777 kN | | Total longitudinal force on Rail 2 = -0,777 kN | |
| Acceleration of the crane bridge (tp2) , Fx,i,j | 0,214 kN | -0,214 kN | 0,787 kN | -0,787 kN |
| Acceleration of the crane bridge (tp2), Fy,i | Total longitudinal force on Rail 1 = -0,777 kN | | Total longitudinal force on Rail 2 = -0,777 kN | |
| Skewing of the crane (tp1), (Rail 1 guiding), Fx,i,j, S1=0 kN | 0 kN | -3,98 kN | 0 kN | -1,33 kN |
| Skewing of the crane (tp2), (Rail 1 guiding), Fx,i,j, S1=0 kN | 0 kN | -1,14 kN | 0 kN | -4,17 kN |
| Skewing of the crane (tp1), (Rail 2 guiding), Fx,i,j, S2=0 kN | 0 kN | -3,98 kN | 0 kN | -1,33 kN |
| Skewing of the crane (tp2), (Rail 2 guiding), Fx,i,j, S2=0 kN | 0 kN | -1,14 kN | 0 kN | -4,17 kN |
| Acceleration of trolley(s), Fx,i,j | -0,123 kN | -0,123 kN | -0,123 kN | -0,123 kN |
| In-service wind (tp1), Fy,i | Total longitudinal wind force on Rail 1 = 0 kN | | Total longitudinal wind force on Rail 2 = 0 kN | |
| In-service wind (tp2), Fy,i | Total longitudinal wind force on Rail 1 = 0 kN | | Total longitudinal wind force on Rail 2 = 0 kN | |
| Storm wind, Fy,i | Longitudinal force on storm lock 1 = 0 kN | | Longitudinal force on storm lock 2 = 0 kN | |
| Crane collision to buffers (tp1), FB,i | Buffer force on Rail 1 = 7,88 kN | | Buffer force on Rail 2 = 5,69 kN | |
| Crane collision to buffers (tp2), FB,i | Buffer force on Rail 1 = 5,74 kN | | Buffer force on Rail 2 = 7,83 kN | |

(Fx,i,j = Transverse force of Wheel j on Rail I, Fy,i = Longitudinal force on Rail I, Fz,i,j = Vertical force of Wheel j on Rail I, S1 = Guiding force on Rail 1, S2 = Guiding force on Rail 2)