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ABBREVIATIONS AND SYMBOLS LIST

a = Distance between the shaft (mm).

a_c = Average number of working cycles per month.

A = Ratio between the diameter of drum or pulley and the rope diameter.

A_t = Area of neck on the twist lock pin (mm)

b = Width of gear face (mm).

b_o = Size factor.

b_{rct} = Tooth width of the ratchet gearing (cm).

b_s = Surface factor.

c_B = load factor for crane.

ck = Pitch clearance (mm).

C = Factor characterizing rope construction and the ultimate tensile strength of the wire material.

C_1 = Factor depending on the rope diameter.

C_2 = Factor determining the additional production and operational factors not accounted for by factor C and C_1.

Cm = Factor correction moment.

C_s = Distance between the shaft of sprocket (mm).

Ct = Factor correction torque.

d_f = Dedendum circle diameter (mm).

d_i = Diameter inside bearing (mm).

d_k = Addendum circle diameter (mm).

d_m = Mean diameter (mm).

d_o = Diameter outside bearing (mm).

d_{pawl} = Diameter of the ratchet wheel pawl pivot (cm).

d_r = Diameter of the rope (mm).

d_s = Shaft diameter (mm).

d_0 = Pitch circle diameter (mm).

D_d = Diameter of the drum and pulley (mm).

D_k = Diameter of outside sprocket (mm).

D_l = Diameter of the compensating pulley (mm).

D_p = Pitch circle diameter of sprocket (mm).

D_r = Diameter of tyre (mm).

D_{rct} = Ratchet wheel diameter (cm).

D_B = Diameter of naf sprocket (mm).

e_1 = Crane with very heavy condition of operating.

e_2 = Factor depending on rope construction.

f = Coefficient of adhesion of wheels with rail.

f_c = Correction factor.

f_h = Life factor.

f_n = Speed factor for roller bearing.

f_v = Dynamic factor.

F = Plan load of sprocket (kg).

F_g = Hoisting load (kg).

F_{gl} = Hoisting equipment load (kg).

F_{rct} = The peripheral force on the outside diameter of the ratchet wheel (kg).

F_t = Tangential tooth load (kg).

F_u = Permission maximum load of sprocket (kg).

F_B = Average limited strength of sprocket (kg).

F'_b = Permission bending load per width (kg/mm).

F'_H = Permission surface load per width (kg/mm).

F_{222} = The rope cross-section (mm^2).

G = Rigidity module of the steel (kg/mm^2).

G_o = Magnitude of the weight (kg).

G_0 = Weight of the trolley (kg).

GD^2 = Gyration moment of motor and gyration moment of coupling ($kg.m^2$).

$GD^2_{coupling}$ = Gyration moment of the coupling ($kg.m^2$).

GD^2_{motor} = Moment of gyration ($kg.m^2$).

h = The travel of the brake lever (mm).

H_r = Height to which the load is raised (mm).

H = Height of teeth gear (mm).

i = Ratio of transmission.

i_w = Number of wires.

I = Moment of inertia (cm^4).

I_c = Moment of inertia for coupling ($kg.m/sec^2$).

k = Coefficient of rolling friction.

k_t = Concentration stress factor

k_H = The factor of strength contact (kg/mm^2).

K = The effort applied by the operator on the brake lever (kg).

l = Lead (mm).

l_h = The length of the helix on the drum (mm).

L_d = Length of the drum (mm).

L_h = Bearings nominal life (hours).

L_p = Length of chain.

m = The module of gears.

m_{rct} = Module of the ratchet gearing (cm).

m_z = Factor depending on the number of repeated bends of the rope z during the period of its wear until it fails.

M = Bending moment (kg.mm)

M_{br} = Braking moment (kg.m).

M_{dyn} = Dynamic Torque In Acceleration (kg.m).

M_{st} = Static Moment Of Motor (kg.m).

M'_{dyn} = Dynamic moment braking (kg.m).

M'_{st} = Static moment braking (kg.m).

n = Speed of the shaft (rpm).

n_{drum} = Drum speed (rpm).

n_{output} = Speed of little sprocket (rpm).

n_r = Speed of tyre (rpm).

n_w = Wheels speed (rpm).

N = The life of the rope (months).

N_{br} = Braking power (kW or HP).

N_{cs} = Critical speed of shaft (rpm).

N_{rated} = Rated power (kW).

N_{st} = Static Power (kW or HP).

p = Pitch of sprocket (mm).

P = Equivalent radial load (kN).

P_a = Permission maximum pressure (kg/mm^2).

P_d = Plan power (kW).

P_k = The total peripheral braking force on the drum surface (kg).

P_{max} = The force exerted on the wheels (kg).

P_{rct} = Pressure on unit length of the ratchet wheel tooth (kg/cm).

Q = Load (kg).

Q_{tot} = Total load (kg).

s_f = Safety factor.

t = Thickness of the pin (mm).

t_{br} = Breaking time (sec).

t_s = Starting time (sec).

T = Torque on the shaft (kg.mm).

v = Pheripheral velocity (m/s).

v_c = Velocity of chain (m/s).

v_d = Velocity of the drum (m/min).

v_h = Hoisting velocity (m/min).

v_r = Travelling velocity (m/min).

v_t = Trolley velocity (m/s).

V_d = Volume displacement (cm^3).

w = Width of the pin (mm).

W = Resistance to motion (kg).

W_g = Gears weight (kg).

W_s = Shaft weight (kg).

Y = The tooth form factor.

Y_b = Bending deflection (mm).

z = Number of teeth gear.

z_p = Amount of pulley.

z_1 = The number of repeated bends.

z_2 = Number of repeated bends per cycle (raising and lowering) at the full lifting height and one-sided bending.

z_3 = The number of bends (bends).

Z_{adh} = Adhesive force (kg).

Z_i = The maximum permissible tension (kg).

Z_p = Tension on the rope (kg).

Z_{rct} = Number of teeth ratchet gearing.

α = Pressure angle (degree).

α' = Angle of wrap (degree).

β = Braking coefficient.

B' = Factor of change in the endurance of the rope due to lifting the load to less than the full height and to lifting less than the full load.

δ = Coefficient accounting for effect of the mass of transmission mechanism.

δ_s = Permissible deflection for the shaft (cm).

δ_w = Diameter of wire (mm).

δ_y = Deflection of the shaft (cm).

σ = True tensile stress in the rope (kg/mm^2).

σ_a = Bending strength (kg/mm^2).

σ_b = Breaking strength (kg/mm^2).

σ_{bend} = Safety bending stress (kg/cm^2).

σ_{bw} = Endurance strength for building steel (kg/mm^2).

σ_{bwn} = Ultimate tensile stress (kg/mm^2)

σ_B = Tensile strength (kg/mm^2).

σ_{comp} = The tension stress (kg/mm^2).

σ_i = Permission of bending stress on the shaft (kg/mm).

σ_{max} = Local unit compressive stress (kg).

σ_{zul} = Permission tensile stress (kg/mm^2).

μ = Coefficient of friction.

τ = Shear strength on the pin (kg/mm^2).

τ_a = Permission shear strength (kg/mm^2).

τ_{tw} = Endurance strength for building steel (kg/mm^2).

τ_{twn} = Ultimate shear stress (kg/mm^2).

φ = Coefficient dynamic for constant load.

ρ = Density of the steel (kg/mm^3).

η_p = Pulley efficiency.

η = Efficiency of the mechanism.

ω = The wall thickness of a welded drum (mm).

ω_m = Coefficient of movement resistance.

θ = Torsion deflection (degree).