Forces at the roller guide

F_x	:	Force in feed direction
F_y	:	Force in Y direction
F_z	:	Force in Z direction
M_x	:	Moment for longitudinal axis (X)
M_y	:	Moment for lateral axis (Y)
M_z	:	Moment for vertical axis (Z)
F_r	:	Force on the roller
l_y	:	Guiding distance in y direction (see Table on page TL11)
l_{x1}	:	Guiding distance in x direction (see Table on page TL11)
l_{x2}	:	Guiding distance in x direction (see Table on page TL11)

Direction of force F_y

F_y shared by 2 rollers

$$F_r = F_y \cdot 0.5$$

Direction of force F_z

$+F_z$ and $-F_z$ shared by 4 rollers

$$F_r = F_z \cdot 0.25$$

Moment M_x

M_x shared by 2 rollers

$$F_r = M_x / l_y \cdot 0.5$$

Moment M_y

M_y shared by 2 rollers

$$F_r = M_y / l_{x2} \cdot 0.5$$
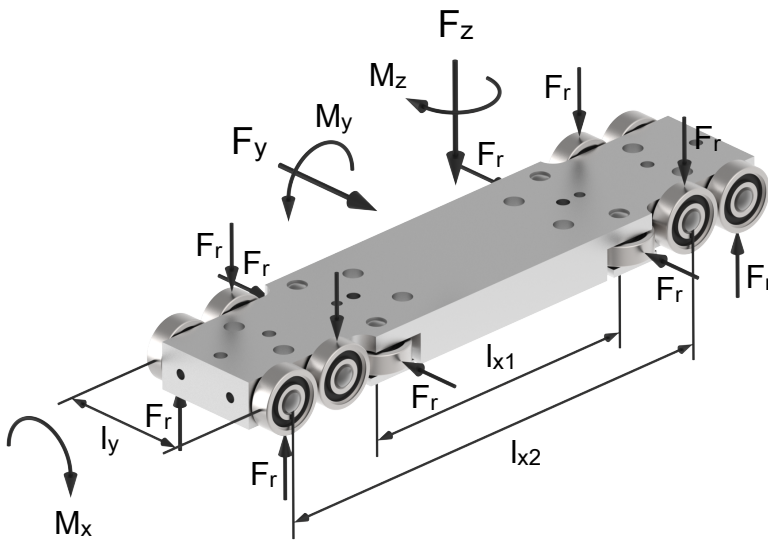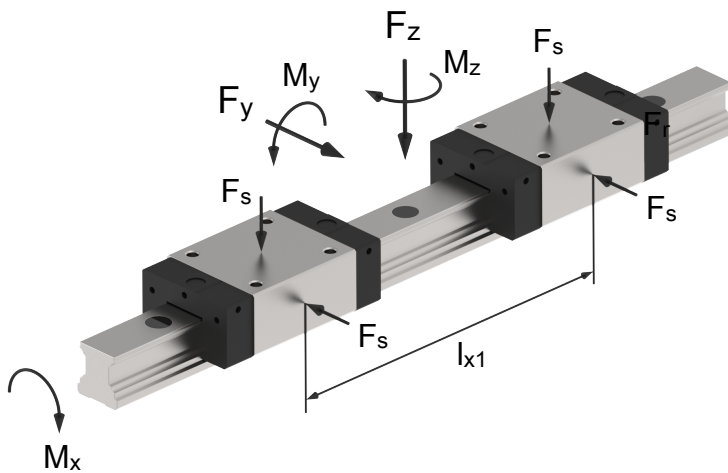
Moment M_z

M_z shared by 1 roller

$$F_r = M_z / l_{x1} \cdot 1$$

F_x : Force in feed direction

F_y : Force in Y direction

F_z : Force in Z direction

M_x : Moment for longitudinal axis (X)

M_y : Moment for lateral axis (Y)

M_z : Moment for vertical axis (Z)

M_t : Permissible dynamic moment for the guide carriage

(see Table on page TL12)

C : Dynamic load rating (C_{dyn}) for the guide carriage

(see Table on page TL12)

F_s : Force on a carriage

I_{x1} : Guiding distance in x direction (see Table on page TL12)

Direction of force F_y

F_y shared by 2 carriages

$$\mathbf{F_s} = F_y \cdot 0.5$$

Direction of force F_z

F_z shared by 2 carriages

$$\mathbf{F_s} = F_z \cdot 0.5$$

Moment M_x

M_x shared by 2 carriages
With combined external load (F_z and F_y)
in combination with a torsional moment

$$\mathbf{F_s} = |F_z| + |F_y| + C \cdot (|M_x| / M_t) \cdot 0.5$$

Moment M_y

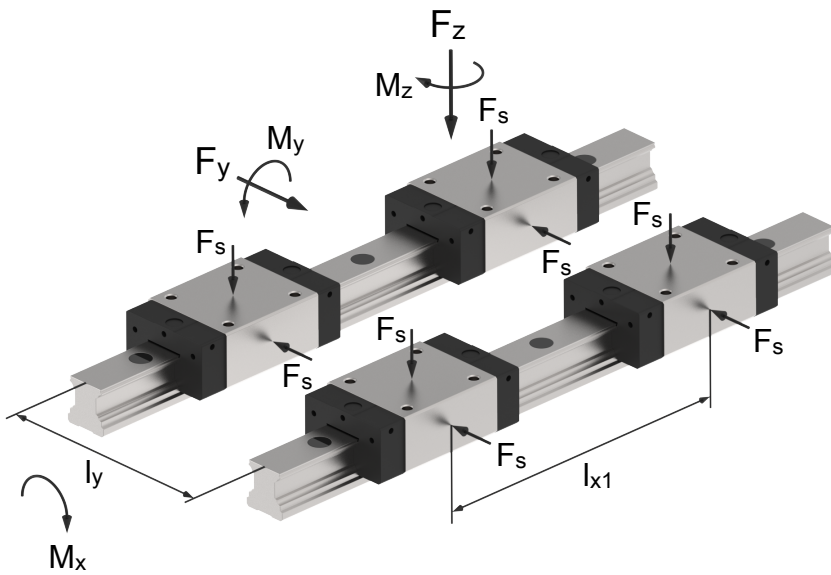M_y shared by 2 carriages
(with opposite direction of force)

$$\mathbf{F_s} = M_y / I_{x1} \cdot 1$$

Moment M_z

M_z shared by 2 carriages
(with opposite direction of force)

$$\mathbf{F_s} = M_z / I_{x1} \cdot 1$$

Forces at the double rail guide

F_x	:	Force in feed direction
F_y	:	Force in Y direction
F_z	:	Force in Z direction
M_x	:	Moment for longitudinal axis (X)
M_y	:	Moment for lateral axis (Y)
M_z	:	Moment for vertical axis (Z)
F_s	:	Force on a carriage
l_y	:	Guiding distance in y direction (see Table on page TL12)
l_{x1}	:	Guiding distance in x direction (see Table on page TL12)

Direction of force F_y

F_y shared by 4 carriages

$$F_s = F_y \cdot 0.25$$

Direction of force F_z

F_z shared by 4 carriages

$$F_s = F_z \cdot 0.25$$

Moment M_x

M_x shared by 4 carriages
(2 per opposite direction of force)

$$F_s = M_x / l_y \cdot 0.5$$

Moment M_y

M_y shared by 4 carriages
(2 per opposite direction of force)

$$F_s = M_y / l_{x1} \cdot 0.5$$

Moment M_z

M_z shared by 4 carriages
(2 per opposite direction of force)

$$F_s = M_z / l_{x1} \cdot 0.5$$