

# Cross Roller Tables - Overview

## About Part Numbers

Part numbers of MISUMI Cross Roller Tables and Cross Roller Guides have been changed since the 2010 catalog. See the information below.

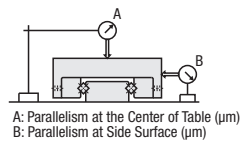
Product Name	Shape	Old Part Number	New Part Number	Page
Cross Roller Tables		SYT	CRT	P547 P548
		SYTD	CRTD	
		SYTS	CRTS	
		SYTSD	CRTSD	
		SVT	CRU	
Cross Roller Guides		SV	CRV	P549
		SVS	CRVS	

## Structure and Features

Product Name	Feature	Structure
Cross Roller Tables	Highly accurate and rigid cross roller tables with cross roller guides CRV integrated with accurately finished ground tables and bases.	
Cross Roller Guides	The linear motion bearing structure comprised of two 90-deg. V grooved rails and cylindrical rollers. The rollers are arranged alternately orthogonal to each other, and the structure is able to support moment loads in all directions.	
Ball Slide Guides	With no circulation of rolling elements, the Ball Slide Guides slide smoothly, accurately and quietly with little friction.	

## Precision

**Cross Roller Tables**  
Accuracies of Cross Roller Tables are shown by the dial indicator as the table is moved (no load).



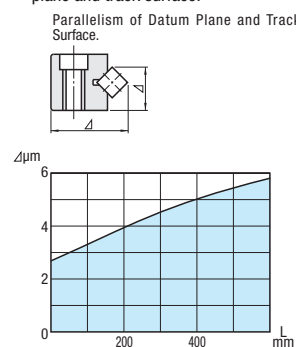
No.	CRT CRTD CRTS CRTSD			CRU		
	Deflection A	Height H Tolerance	Width W Tolerance	Deflection A	Height H Tolerance	Width W Tolerance
1025	4			4		
1035	5			5		
1045	5			5		
2035	4	±100	±100	2	±100	-200~ -400
2050	4			4		
2065	5			5		
3055						±100
3080						



**Ball Slide Guides**  
Accuracies of Cross Roller Guides are shown by the dial indicator deflection at table move as the Cross Roller Table CRT Series.

L	BSG BSGP BSGM BSGMP		
	Deflection A	Height H Tolerance	Width W Tolerance
L ≤ 45	4	±20	±25
L ≥ 55	5		

**Cross Roller Guides**  
Accuracies of Cross Roller Guides are shown by the parallelism of datum plane and track surface.



## Load Rating

Calculate the cross roller guide load ratings as below.

1 Rail	Vertical Use of 1 Rail	Parallel Use of 2 Rails
Dynamic Load Rating (N) $C = \left(\frac{Z}{2}\right)^{3/4} \cdot C_1$	Dynamic Load Rating (N) $C = \left(\frac{Z}{2}\right)^{3/4} \cdot C_1 \cdot 2^{7/9}$	Dynamic Load Rating (N) $C = \left(\frac{Z}{2}\right)^{3/4} \cdot C_1 \cdot 2^{7/9}$
Static Load Rating (N) $C_0 = \left(\frac{Z}{2}\right) \cdot C_{01}$	Static Load Rating (N) $C_0 = \left(\frac{Z}{2}\right) \cdot C_{01} \cdot 2$	Static Load Rating (N) $C_0 = \left(\frac{Z}{2}\right) \cdot C_{01} \cdot 2$

C<sub>1</sub>: Basic Dynamic Load Rating per Roller (N) C<sub>01</sub>: Basic Static Load Rating per Roller (N) Z: No. of Rolling Elements

## Rated Life

Calculate the rated life of cross roller guide with the following formula.

$$L = \left( \frac{f_T \cdot C}{f_w \cdot P} \right)^{10/3} \cdot 50$$

L: Operating Life (km) f<sub>T</sub>: Temperature Factors (See Fig. 2)  
C: Dynamic Load Rating (N) f<sub>w</sub>: Load Factors (See Table-4) P: Applied Load (N)

## Life Hours

$$L_h = \frac{L \cdot 10^3}{2 \cdot \ell_s \cdot n_1 \cdot 60}$$

L<sub>h</sub>: Life Hours (hr) L: Operating Life (km)  
ℓ<sub>s</sub>: Stroke Length (m) n<sub>1</sub>: Reciprocating cycles per Minute (cpm)

## Load Factor (f<sub>w</sub>)

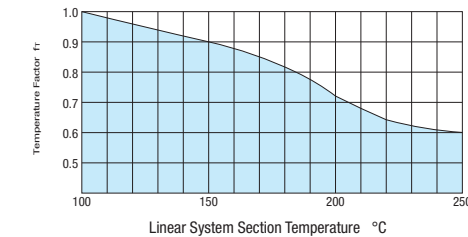
To calculate load applied to the Cross Roller Tables, other than object weight, it requires inertia force attributed to motion velocity or moment loads. It, however, is difficult to attain accurate calculations due to potential vibration and impacts caused during reciprocating motion, other than repeated start-stop motions. Therefore, Load Factor Table helps simplify life calculations.

Condition of Use	f <sub>w</sub>
No shocks/vibrations, low speed: 15m/min. or less	1.0~1.5
No significant shocks/vibrations, medium speed: 60m/min. or less	1.5~2.0
With shocks/vibrations, high speed: 60m/min. or more	2.0~3.5

## Temperature Coefficient (f<sub>T</sub>)

If the Cross Roller Table temperature exceeds 100°C, the Cross Roller Table and shaft hardness decreases, resulting in less allowable load and shorter life than used at a room temperature. Please correct the rated life according to the temperature factors. Please use Cross Roller Guides under the allowable temperature shown on each product page.

Fig. Temperature Coefficient



## Cross Roller Guides Mounting Procedures

- Secure rails A, B and C on the table and base with screws and temporarily tighten screws on rail D (Fig. 1).
- Remove end stops and insert the cage from the end (Fig. 2).
- Adjust the table position to place the cage in the center of the rail.
- Mount the dial indicator to the predetermined position (Fig. 3).
- Stroke the table and tighten the adjustment screws within the cage (a-e) with a torque wrench (Fig. 4 ~ 6).
- Repeat (5) until the dial indicator value becomes and remains minimum.
- Fully tighten the adjustment screws while the dial indicator value remains minimum.
- Fully tighten the screws on rail D.

