

Cable Chain Cleanliness Class DATA

Reported by Mr. Chae Sang Yoon, Quality Assurance Team

Date: July 31, 2004



Tested by	Mr. Chae Sang Yoon, Quality Assurance Team
Test Date	July 30, 2004
Test Place	Clean Room (1000 Class)
Test Conditions	Temperature 19.5 ' ~21.5 ', Humidity 50% ~ 51%

Robostar Co., Ltd

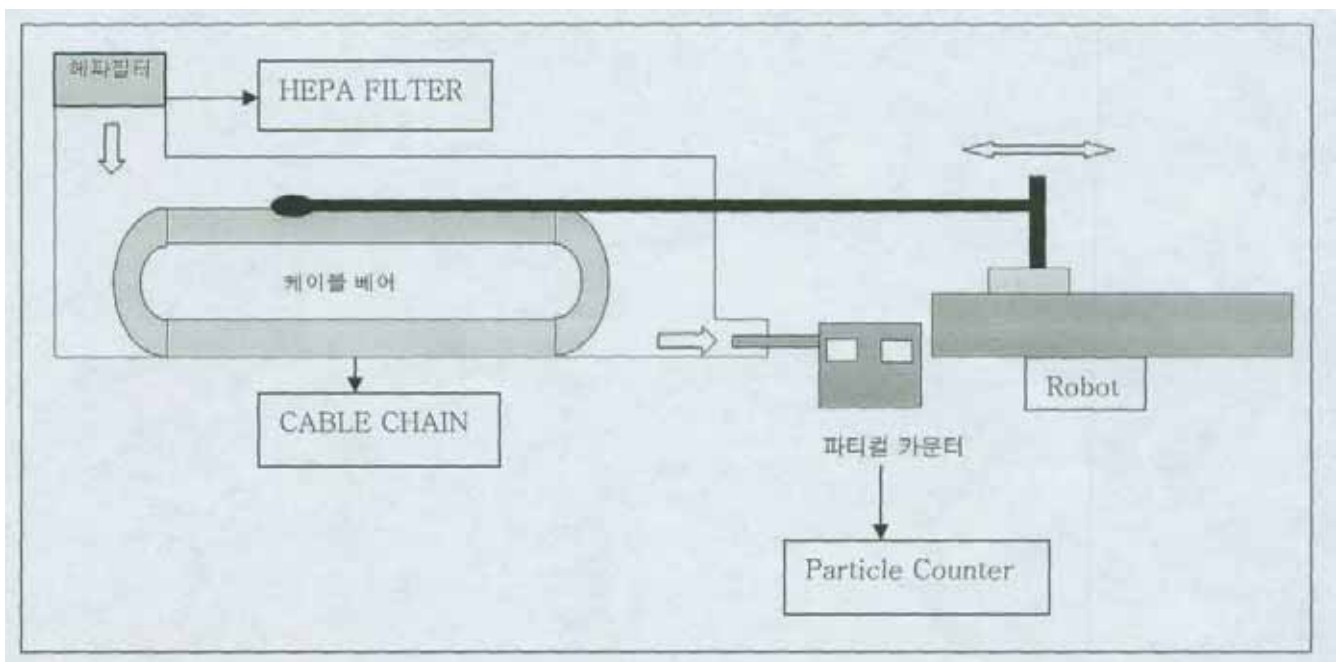
1. Test Items

1.1 Cable chain (CP028CR.55.R75-2000L)

1.2 Cable chain (CP040CR.75.R150-2000L)

2. Test Method / Conditions

Method of Measuring the Cleanliness



1) Maximum Speed(Motor): 3,000 [rpm]

Setting the Controller and Robot to reach temporary maximum speed, 3,000 [rpm].

2) Robot Specification

Without damaging to Motor, set the speed adjustment to reach maximum speed, 3000 [rpm]

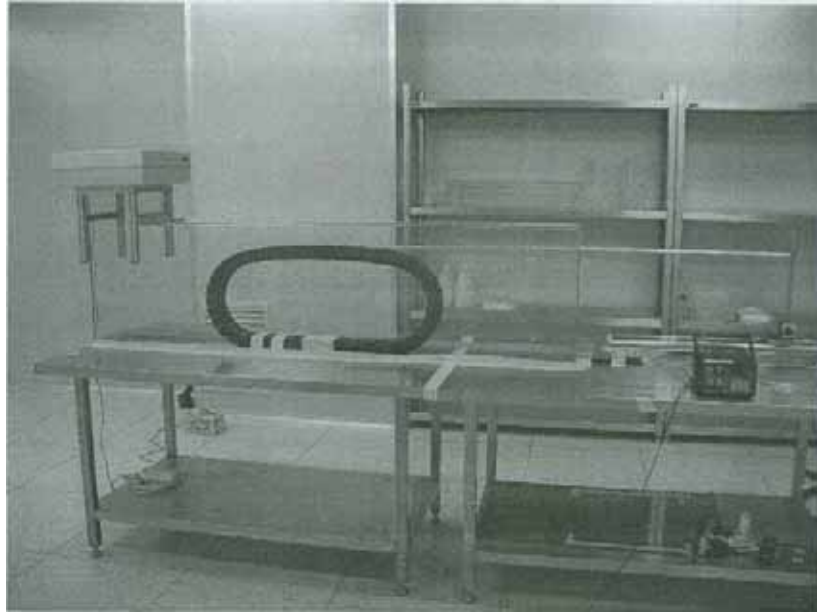
a. RBCD 21NSA

b. Pitch/rev 10, ST 600

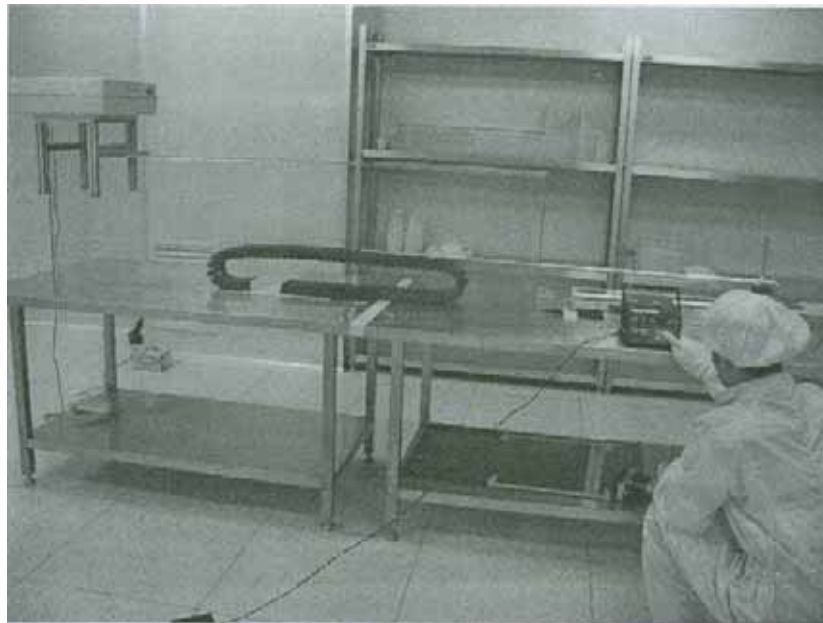
3) Test Oxygen Quantity: 28.3 L

4) Test Time: 10[min]/No

5) Test Particle: Over 0.3 um



(Fig 1 Tool, Arrangement of Test Apparatus)



(Fig 2 Measurement)



(Fig 3 Particle Counter)

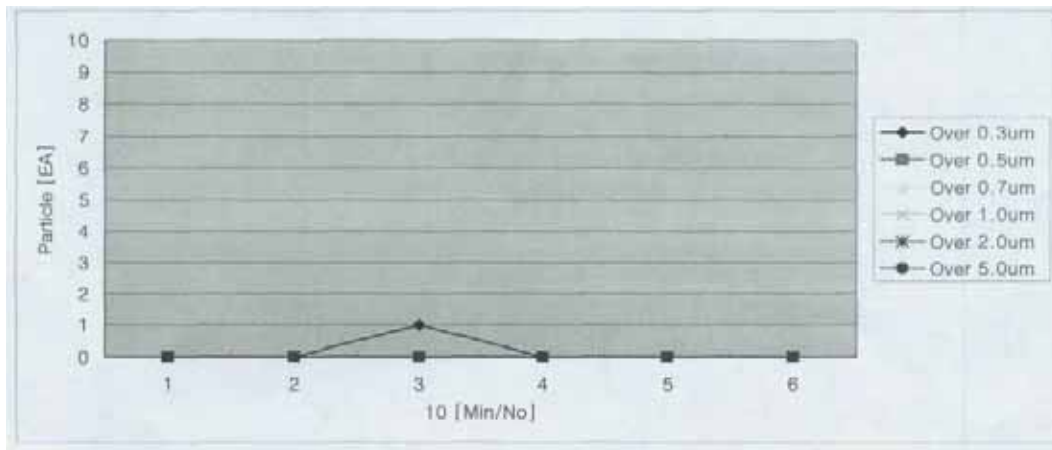


(Fig 4 HEPA Filter)

3. Test Result 1 (Value Scope)

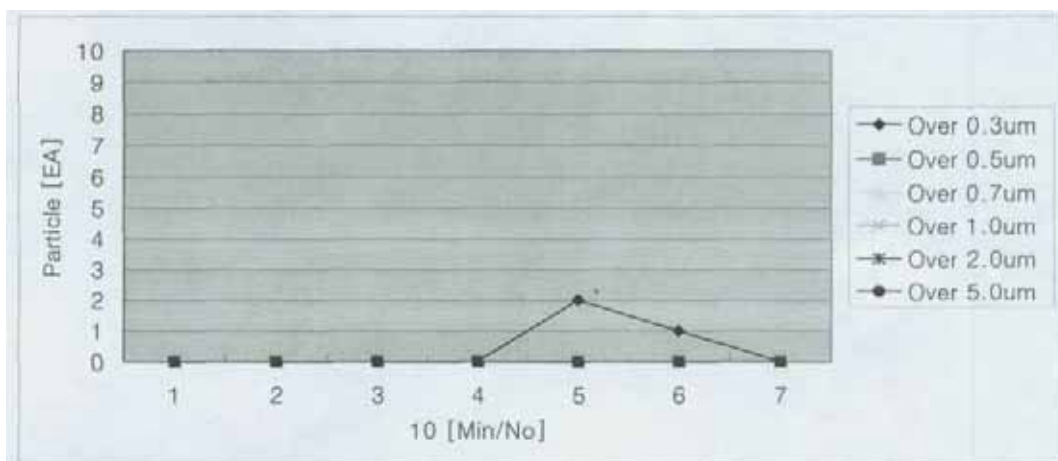
3.1 Cable Chain(CP028CR.5.R75-2000L)

Cable Chain(CP028CR.5.R75-2000L)						
Rate	Particle Size					
	Over 0.3 um	Over 0.5um	Over 0.7um	Over 1.0 um	Over 2.0 um	Over 5.0 um
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	1	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
Min	0	0	0	0	0	0
Max	1	0	0	0	0	0
AVG	0	0	0	0	0	0



3.2 Cable Chain (CP040CR.75.R150-2000L)

Cable Chain(CP040CR.75.R1 50-2000L)						
Rate	Particle Size					
	Over 0.3 um	Over 0.5 um	Over 0.7um	Over 1.0 um	Over 2.0 um	Over 5.0 um
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	2	0	0	0	0	0
6	1	0	0	0	0	0
7	0	0	0	0	0	0
Min	0	0	0	0	0	0
Max	2	0	0	0	0	0
AVG	0	0	0	0	0	0



4. Test Result 2 (Class) 4.1

Cleanliness Class Standard

This is conversion table.

High particle count limits of each cleanliness class (particles/CF)

Particle size	Cleanliness						
	2	28	285	2,857	28,571	275,814	2,857,142
0.1 um or bigger	0	6	67	674	-	-	-
0.2 um or bigger	0	2	28	288	2,885	28,857	288,571
0.3 um or bigger	0	1	10	100	1,000	10,000	100,000
JIS	Class-2	Class-3	Class-4	Class-5	Class-6	Class-7	Class-8
ISO		Class 1	Class 10	Class 100	Class 1,000	Class 10,000	Class 100,000

* JIS : Japanese Industrial Standard

* ISO : International Organization for Standardization

4.2 Product Class

Section	Cable Chain (CP028CR.5.R75-2000L)	Cable Chain (CP040CR.75.R150-2000L)
CLASS	Class 1~10	Class 1~10

5. Others

Test result will be different according to following test conditions.

- 1) Clean Test Method
- 2) Speed
- 3) Moving Distance
- 4) Width
- 5) Test Time
- 6) Test Particle Size
- 7) Aging Time