

(9)

- (1) -

9.

9.1

(1)	.
(2)	.
(3)	가 , .
(4)	, .
(5)	QC 77가 , .
(6)	.
(7)	.

(1) (QC)

,
.
, , ,
, ,
.
, (),
.

· , ,
· ,
· ,

· (plan)

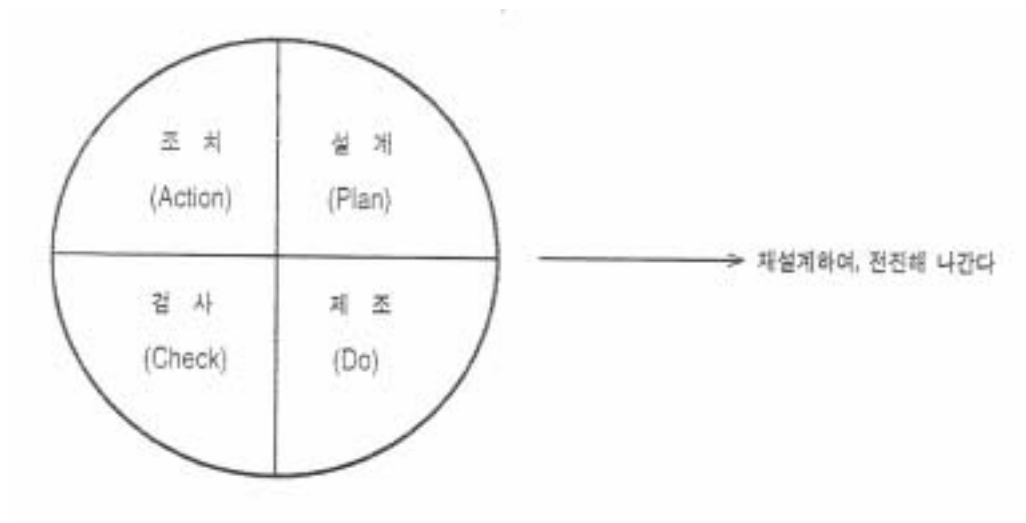
(do)

(check)

(action)

· ,
· ,
· QC ,

“ 가, ” .



< 9.1> (Deming circle)

1)

· ,
· ,
· “

” “ ” ,
 .

 가 .

 ,
 .

2)

, ,
 , 가 ,
 . : , ,
 , .
 . : ,
 .
 . : ,
 .

. A .

○, × .

(1) , .

(2) QC

.

(3) .

(4) , .

(5)	,	,
	.	

$$[\quad](1) \times \quad, \quad .$$

(2) × QC

(3) $\circ$,

$$(4) \quad \times \quad ,$$

(5) $\circ$

. B .

$\circ, \times$.

$$(1) \quad \quad \quad , \quad \quad ,$$
$$(2) \quad \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} = \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} + \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} \mathbf{w}_i, \quad \mathbf{w}_i \in \mathbb{R}^n, \quad \mathbf{w}_i \in \mathbb{R}^n, \quad \mathbf{w}_i \in \mathbb{R}^n$$
$$(3) \quad \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} = \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} + \frac{\partial \mathcal{L}}{\partial \mathbf{w}_i} \frac{\partial \mathbf{w}_i}{\partial \mathbf{w}_i},$$

(4)

(5) , ,

$$[\quad](1) \circ$$

(2) $\times$ - - - .

(3) $\circ$

(4) $\times$

· B ·

() , .

(1) 가

(A) (B) ,

(C)
(D)
(E)

(2) (A)가 , (B)

$$\begin{aligned} & \quad \cdot \quad (C), \\ (D) \quad & \quad , \end{aligned}$$

(E) .

[가

]

(3) (A), (B), (C)

,

(A) , , (D),

.

(B) , , (E)

(C) , (F) ,

[

]

[]

	A	B	C	D	E	F
(1)						
(2)						
(3)						

. B .

A B , .

A () B ()

(1) ,

.

(2)

.

(3) , .

[] (1) - (2) - (3) -

(2)

$$= \begin{aligned} & \cdot \quad , \\ & + \\ & + \\ & + \\ & \dots\dots\dots \\ & \dots\dots\dots \end{aligned}$$

가 ,

.

,

.....

.....

가 .

1)

, ,

·
·
·

a)

b)

2가

a)

.....

無限모집단



b)

.....



2)

,

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 ,
 .
 .
 .
 ,
 ,
 .
 .
 .
 ,

3)
 가 .

..... ,
 ,

4)
 , , ,

a) (: $\bar{x}$)

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n}$$

b) (median : $\bar{x}$)

c) (midpoint : M)

$$M = \frac{X_{\max} + X_{\min}}{2}$$

d) (mode : Mo)

가

5)

가 .

a) () (S)

$$S = (x_i - \bar{x})^2$$

b) (S₂)

$$S^2 = \frac{S}{n}$$

c) (V)

$$V = \frac{S}{n-1}$$

d) (s)

$$s = \sqrt{s^2}$$

e) (CV)

$$CV = \frac{s}{\bar{x}} \times 100$$

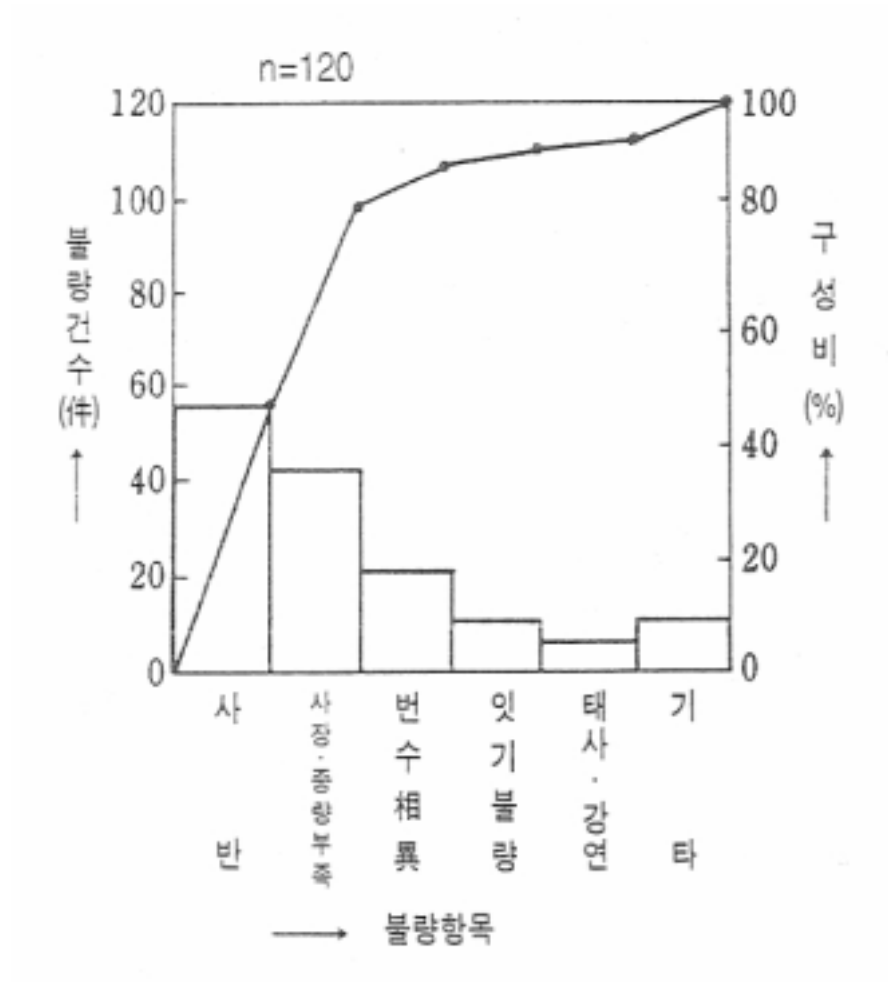
(3) QC 7가

1) 圖

, , () ,

, 가

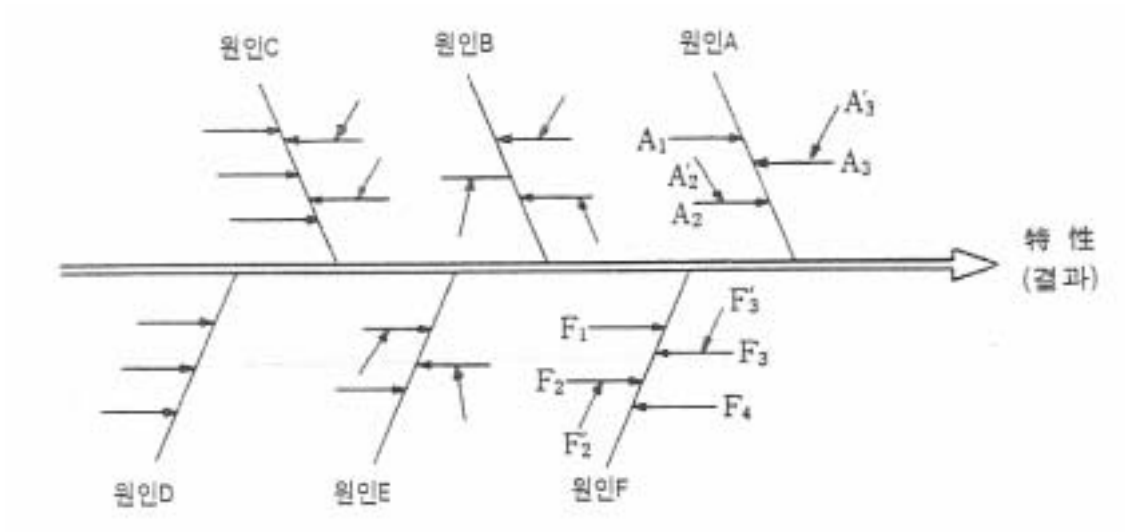
가 ,



< 9.2> (pareto)

2)

가 () () 가



< 9.3>

3) (histogram)

가

, , , .

4) (check sheet)

, “正” “///”

.

.

5) (graph)

,

가

. ,

. , , , ,

. , ,

.

6) ()

2 X Y
가
.
.
가 .

.

7)

.
()
가
.
.
.

(4) ()

가 가 .

, 가
가 . (histogram) . ,
.

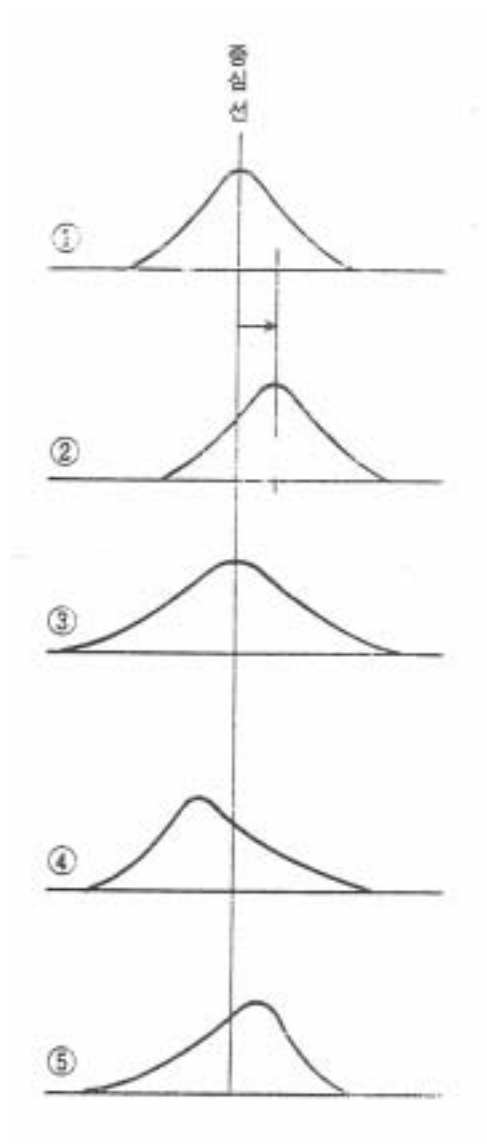
() .

1)

(k) .

가 .

負



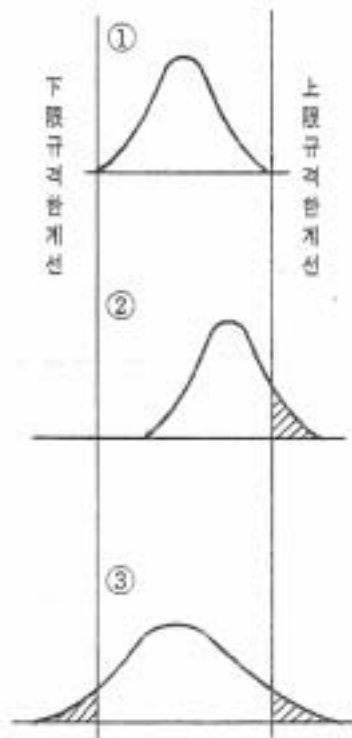
< 9.4>

<

>

. < 9.5> ,

가.



< 9.5>

3)

가

:

,

가

8

$$(S_U - S_L) \div 8 = \sigma$$

, S_U :

S_L :

: , 가

$$(S_U - S_L) \div 6 = \sigma$$

· .

· . , 가

· .

· , .

, 가

· .

가 2 (가)

· .

“ ” “ ”

가 .

a) (Cp : Process Capacity Index)

, S_U : , S_L : , σ :

$$Cp = \frac{S_U - S_L}{6\sigma} = \frac{S_U - S_L}{6\sigma}$$

· , 8σ ,
 $C_p = 8\sigma/6\sigma = 1.33$. , $C_p > 1.33$.
· , 6σ $C_p = 6\sigma/6$
 $\sigma = 1$, $C_p < 1.00$.
· , 4σ $C_p = 4\sigma/6$
 $\sigma = 0.66$, $C_p < 0.66$.
(Cp) 가 .

가	(Cp)	(Ca)
A	$1.33 < C_p$	$Ca < 12.5$
B	$1.00 < C_p < 1.33$	$12.5 < Ca < 25.0$
C	$0.66 < C_p < 1.00$	$25.0 < C_p < 50.0$
D	$C_p < 0.66$	$50.0 < C_p < 100.0$

b) (Ca : Accuracy Index)

, $\bar{x}$: , Sc :

$$Ca = \frac{\bar{x} - Sc}{S_U - S_L} \times 100(\%)$$

· $\bar{x}$ 가 $1/8(S_U - S_L)$

$$Ca = \frac{1/8(S_U - S_L)}{S_U - S_L} \times 100 = 12.5(\%)$$

· $\bar{x}$ 가 $1/4(S_U - S_L)$, $Ca = 25.0\%$

· $\bar{x}$ 가 $1/2(S_U-S_L)$, Ca = 50.0%

· $\bar{x}$ 가 (S_U-S_L) , Ca = 100.0%

가 , (Ca) 가 .

· A ·

○, ×

(1) .

(2) , .

(3) 가

(4)

·

(5) 가

(6) 가 , 가 ,

·

(7) .

(8)

·

(9) , 가 가 .

(10) , 100 .

[] (1) × , , 가

·

(2) × (lap) 가

, 가 .

(3) ○ , 가

.

(4) ○

(5) × .

, ,

.

(6) × .

(7) ○ 가 100

. 가

가 .

(8) × .

(9) ○

(10) ○

. A .

A B ,

A () B ()

(1) 가 가

(2)

(3)

(4)

[] (1) - (2) - (3) - (4) -

· A ·

가 .

Uster U%

(·)

[] , ,

..... , , , , , , ,

· B ·

○, × .

(1) , ,

, 가 ,

가 .

(2) ,

.

(3) 가

.

(4) 가 가 .

(5) ,

가 .

[] (1) ○

(2) × ,

.

(3) × 가

·
(4) × 가 100

· 가 ·

(5) ○ ,

·

· B ·

() ,

(1) (A) (B)가
, (B) (C)

·

[]

(2) (A) (B) ,
, (C)
가 ,

(D) , (E) ·

[가 가
]

(3) (A)
, (B)
, (C) ·
(D) (E)

가

.

[

]

(4) (A) (B)가 , , (C)

,

(D)

1. 2. 3. (E)

.

[

]

(5) 가 (A)

가 . (B) ,

가 . (C) ,

(D)

.

[

]

[]

	A	B	C	D	E
(1)					
(2)					
(3)					
(4)					
(5)					

,

$$(x_{\max}) =$$

$$(x_{\min}) =$$

$$(R) =$$

$$= \frac{\quad}{5} = \dots\dots\dots 5$$

154.5~159.5 .

.

154.5 ~ 159.5		

.

[]

$$x_{\max} = 180, x_{\min} = 157$$

$$R = 180 - 157 = 23$$

$$= \frac{23}{5} = 4.6\cdots\cdots5$$

154.5 ~ 159.5

.

154.9~159.5	/	1
159.5~164.5	### ## //	12
164.5~169.5	### ### ## ## ## //	27
169.5~174.5	### ### ## ## ## ## /	31
174.5~179.5	### ////	9
179.5~184.5	//	2
		82

.

