

폴리아세탈  
Polyacetal (POM)

**DURACON®**

성형기술



폴리플라스틱스주식회사

# DURACON® POM

1.	.....	2
2.	.....	2
2.1	.....	2
2.2	.....	3
2.3	.....	3
3.	.....	4
3.1	.....	4
3.2 가	.....	4
3.3	.....	4
3.4	.....	4
4.	.....	5
4.1	.....	5
4.2	.....	5
4.3	.....	6
4.4	.....	7
4.5	.....	7
4.6	.....	8
4.7	.....	8
4.8	.....	8
4.9	(Mold Deposit) .....	12
5.	( ) .....	13
6. 가	.....	13
6.1	.....	13
6.2	.....	14
6.3	.....	15
6.4	.....	17
7.	.....	18
7.1	.....	18
7.2	.....	18
7.3	.....	19
7.4	.....	24
7.5	.....	24
8.	.....	26
8.1	.....	26
8.2	.....	28
8.3	(Draft) .....	28
8.4	(Under Cut).....	29
8.5 가	(Gas Vent).....	29
8.6	.....	30
8.7	.....	31
9.	.....	33

DURACON®,

가

가

.

# 1.

DURACON® POM (Polyacetal Copolymer) 가

가

DURACON 가 (Blow) ,

DURACON 100%

DURACON

DURACON 가 (M90-44 : , M270-44 : , M25-44 : M90-44 )

가 DURACON

가

가

# 2.

## 2.1

	<p>가</p> <ul style="list-style-type: none"> <li>• : 190 210 (250 가 .)</li> <li>•</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="background-color: #ADD8E6;"></td> <td style="background-color: #ADD8E6;"></td> </tr> <tr> <td>200</td> <td>60</td> </tr> <tr> <td>210</td> <td>30</td> </tr> <tr> <td>230</td> <td>10</td> </tr> </table> <p>가</p> <p>가</p> <p>가</p> <p>DURACON®</p> <p>POM</p>			200	60	210	30	230	10
200	60								
210	30								
230	10								
가									

## 2.2

가  
가  
0.05 0.06ppm  
8 0.1ppm  
0.75ppm

## 2.3

### (1) 가 DURACON

가 가 가  
가 가 가 ( ' ' )  
). DURACON  
가

### (2) 가 DURACON

#### (a) DURACON

DURACON , AS DURACON

#### (b) DURACON

DURACON 가 ( , PBT, PET, PPS )  
가 DURACON 가 ( )  
DURACON DURACON

#### (c)

가

### (3) DURACON

DURACON 가 , 가  
DURACON

### 3.

#### 3.1

DURACON® POM

가 ,

1

가 , 2가

$$1 > = \frac{\text{가} \times 20 \text{ 80\% (가 30 50\%)}}{\text{가} \times 100\text{MPa}}$$

#### 3.2 가

가 가 , DURACON

가 가 . 가

가 ,

(Cavity) 가 ,

(Sink Mark), (Void), 가 .

#### 3.3

(Multi-Cavity) 가 가 ,

가 ,

가 ,

(Flow Mark)

#### 3.4

, DURACON

(Drooling) ,

, DURACON

# 4.

## 4.1

DURACON® POM

- : 80 90 × 3 4
- : 190 210
- : 60 80
- : 50 100MPa
- : 5 50mm/s ( 0.3 3m/min )
- : 100 150rpm

( + ) : +  
 ( ) : 가 가

## 4.2

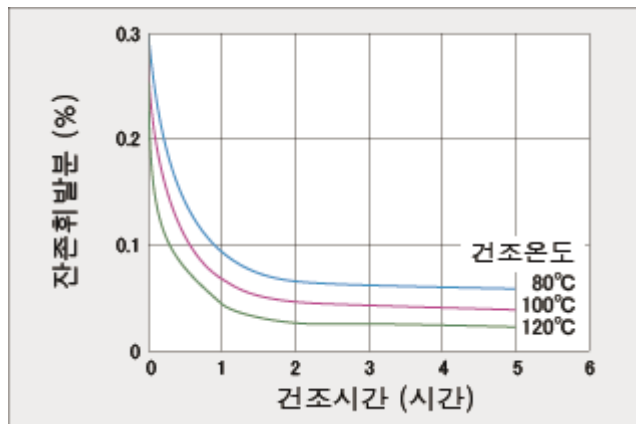
DURACON® POM

가 . 0.1% 가 .

- : 80 90 × 3 4
- : 100 120 × 3 4
- 
- 25mm
- 

가

3 4



4-1

### 4.3

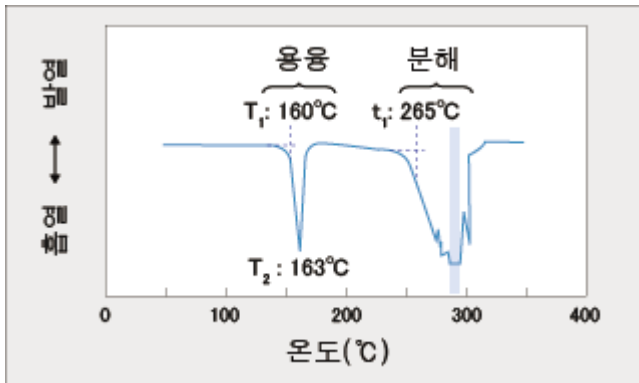
#### 4.3.1

DURACON® POM 165 , 190 210 ( 200~210 )가 ( ) 10 15% (Air Shot)

( ) : 150 170  
 : 170 190  
 : 180 200  
 : 190 210

가 가

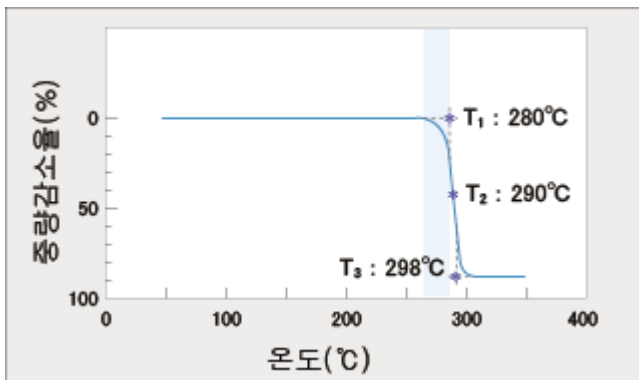
- 가 : ,
- 가 : 가



: 5°C/min  
 : 14mg

T<sub>1</sub>:  
 T<sub>2</sub>:  
 t<sub>1</sub>:

4-2 DSC



: 5 /min  
 : 14mg

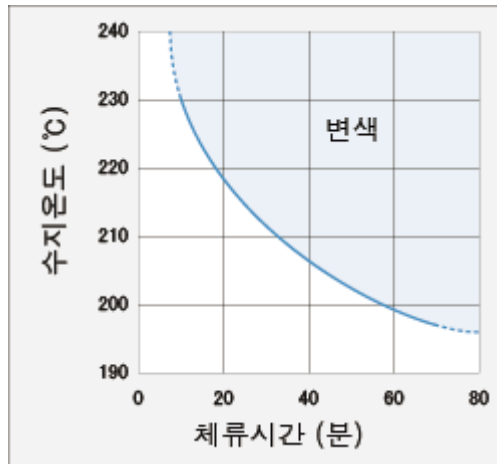
T<sub>1</sub>:  
 T<sub>2</sub>: 50%  
 T<sub>3</sub>:

4-3 TG

4.3.2

, DURACON M90-44

4-4



4-4

4.4

DURACON

60 80

가  
(Annealing)

가

120

30 40

가

- 가
- 가
- MD
- (Short Shot)

4.5

DURACON

: 100MPa

: 50 100MPa

: 80 90%가



- 가
- : (Burr)
- : , , , ,

#### 4.6

- 5 50mm/s (0.3 3m/min) , , (Thickness),
- : 가
- : 가
- 가 가
- 가 : (Jetting), , ,
- 가 : ,

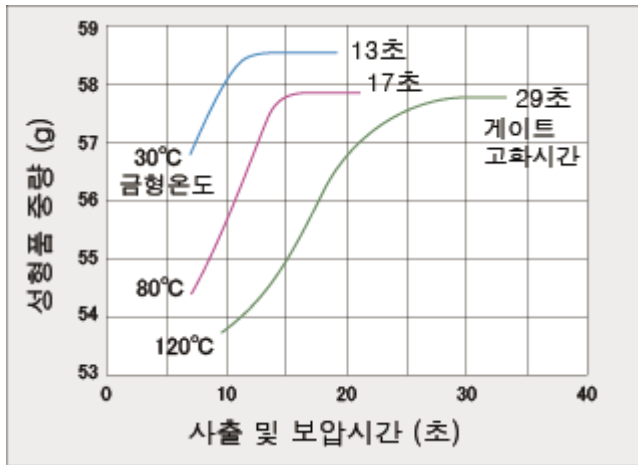
#### 4.7

- : 100 150rpm
- : 0 5MPa
- 가 , ,
- 가 .

#### 4.8

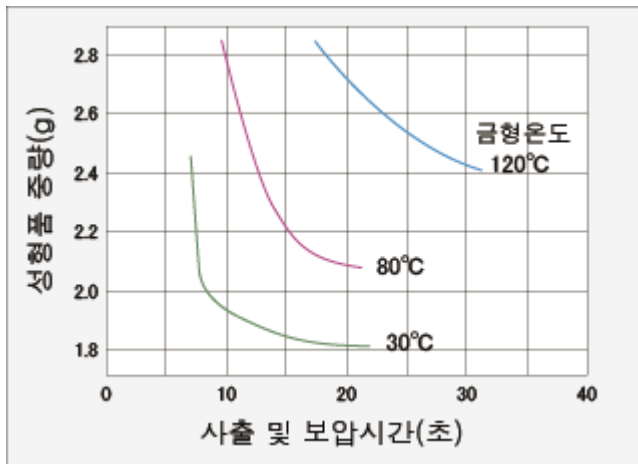
##### 4.8.1

- 가 .
- 4-5 가 .
- ( 4-6)
- ( 4-7)
- , .
- ( 4-8)
- 가 ( 4-9)



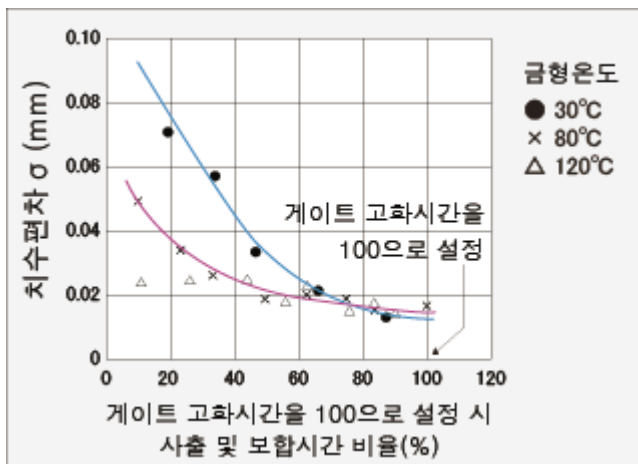
4-5

: 190  
 : 75MPa  
 : 17mm/s  
 :  
 120×120×3mmt  
 ( 4w×2t)



4-6

: 190  
 : 75MPa  
 : 17mm/s  
 :  
 120×120×3mmt  
 ( 4w×2t)



4-7

: ASTM ( 3.2mm)  
 : (213mm)

(Thickness),

가

4-1, 4-2

4-1 ( )

( )	(mm)	(w × t)	( )		
			M90-44	GH-25	
40	1	2 × 1	4	-	
		2 × 1	9	6	
	2	4 × 2	9	6	
		2 × 1	11	10	
		4 × 2	17	10	
	3	6 × 3	20	11	
		2 × 1	14	11	
		4 × 2	20	15	
	4	6 × 3	26	16	
		1	2 × 1	4	-
		2	2 × 1	10	6
	4 × 2		10	7	
60	3	2 × 1	14	10	
		4 × 2	19	12	
		6 × 3	21	12	
	4	2 × 1	15	13	
		4 × 2	22	17	
		6 × 3	31	18	
80	1	2 × 1	5	3	
	2	2 × 1	11	7	
		4 × 2	12	7	
	3	2 × 1	17	14	
		4 × 2	22	14	
		6 × 3	24	15	
	4	2 × 1	18	16	
		4 × 2	27	20	
		6 × 3	34	21	

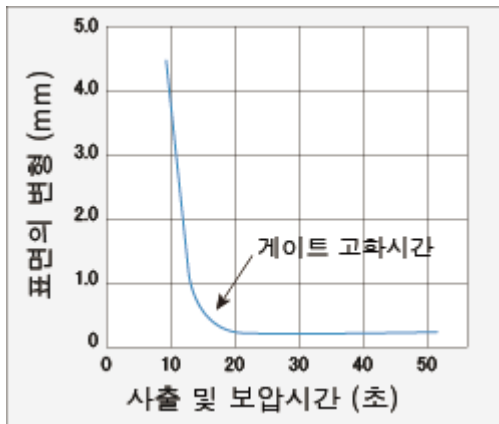
GH-25: 25% : 80mm

4-2

( )

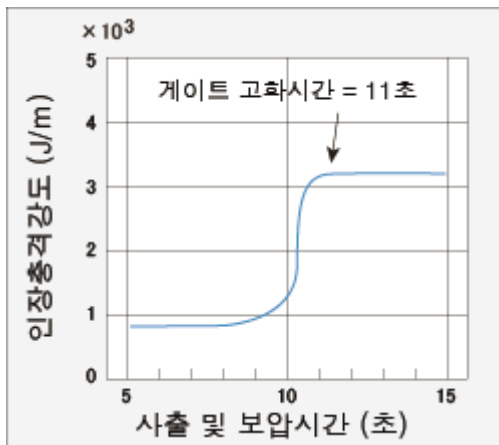
( )	(mm)	(Ø)	( )	
			M90-44	GH-25
40	1	0.5	3.4	2.8
		1.0	3.4	2.8
	2	1.0	8.6	6.2
		1.5	9.0	6.4
		2.0	15.8	11.2
60	1	0.5	3.8	2.8
		1.0	3.8	2.8
	2	1.0	9.8	7.0
		1.5	10.6	7.8
		2.0	18.2	12.8
80	1	0.5	4.2	3.4
		1.0	4.2	3.4
	2	1.0	11.8	7.8
		1.5	12.6	9.0
		2.0	19.2	15.8
	3	2.0	20.6	16.8

GH-25: 25% : 50mm



:  
120mm × 2mm  
(1.5mm )

4-8



:  
: 180  
: 80  
: 100MPa  
: 50mm/s

:  
(2.5mm )

4-9

4.8.2

4-10 DURACON® POM M90-44

가

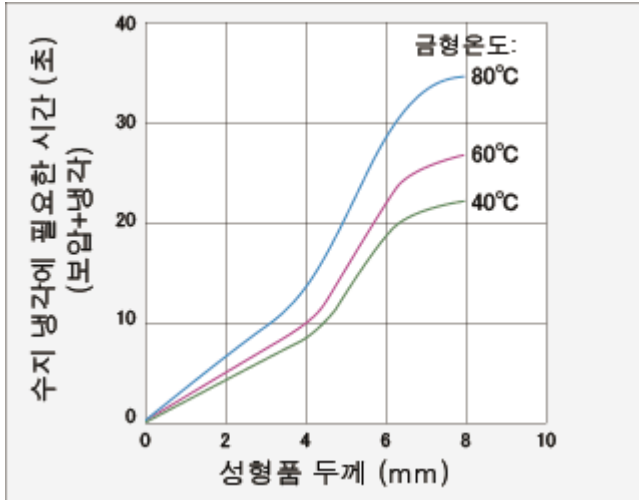
가

가

가 ( + )

가

, 가



4-10

: 80mm 1 8mm

2w×1t ( 1 4mm )  
4w×2t ( 5 8mm )

: 80mm 가

가

가

4.9 (Mold Deposit)

DURACON® POM

가

- ( 60 80 100 120 ),  
( )

- 190 210 , 가

- 1
- (60 )

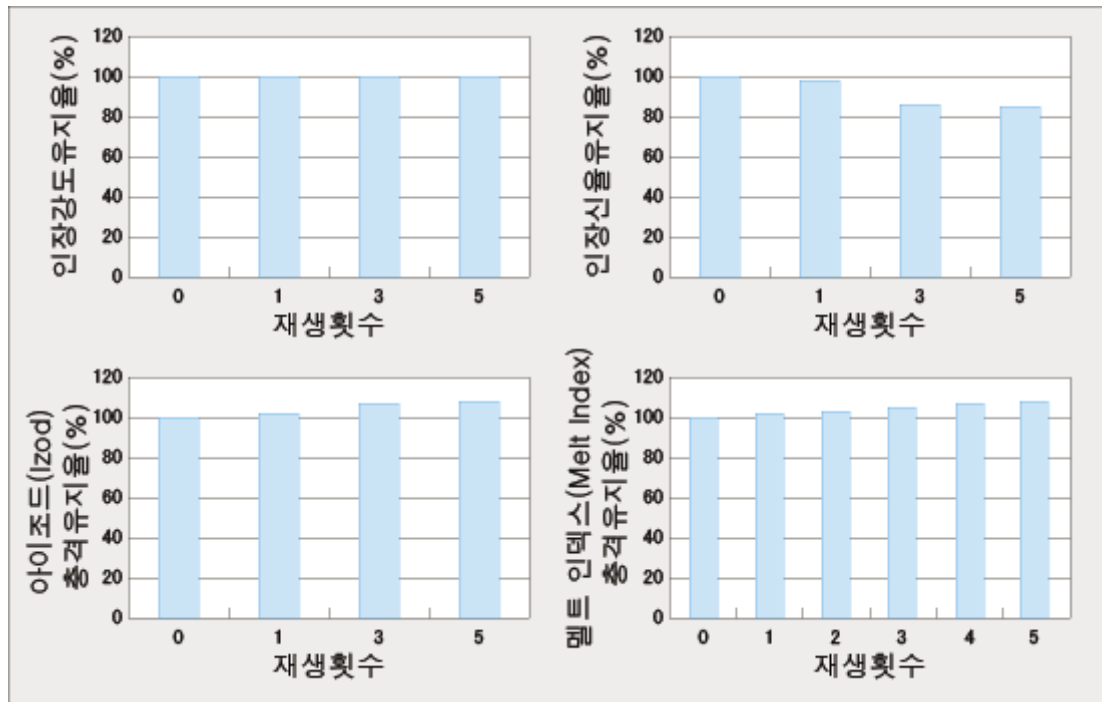
- 가 가 가

## 5. ( )

5-1 100%

가

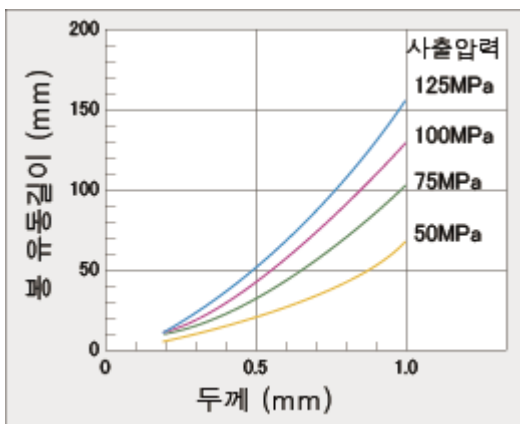
- 가 가
- ... 가
- 가
- ... 가
- ... 가



5-1

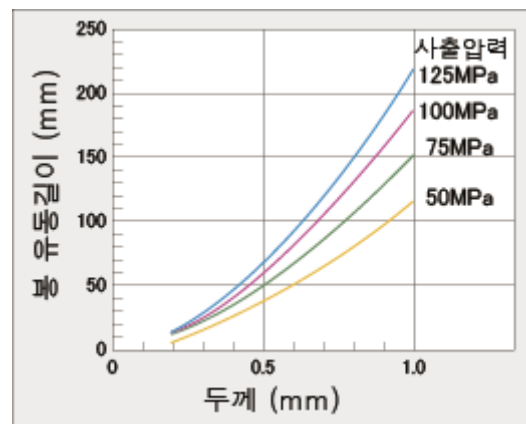
## 6. 가

6.1



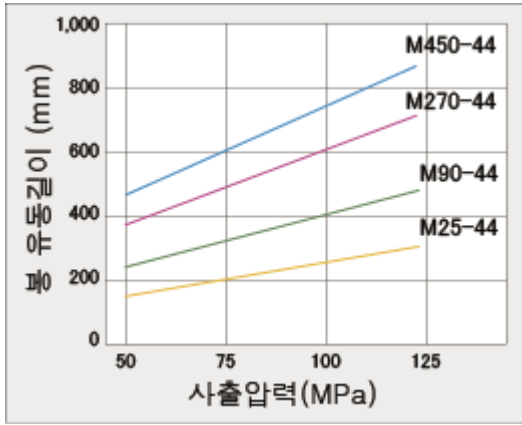
6-1 M90-44

( )



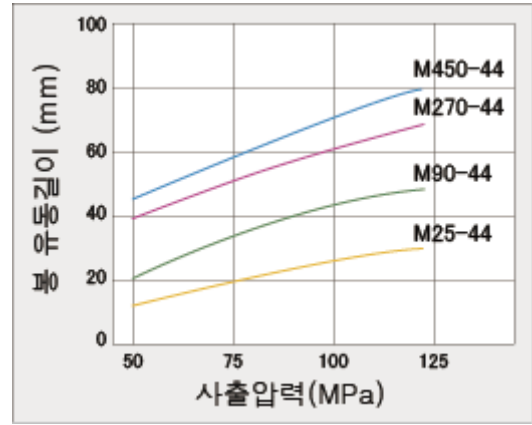
6-2 M270-44

( )



6-3 2mmt

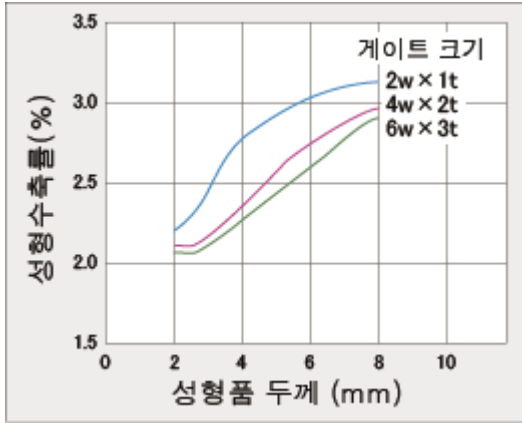
: 190 , 80 ,



6-4 0.5mmt

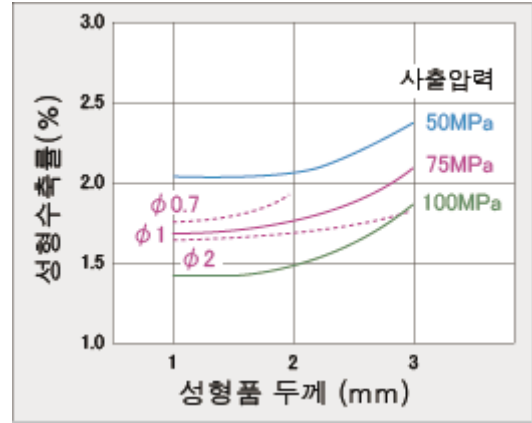
67mm/s

6.2



6-5 M90-44

( )



6-6 M90-44

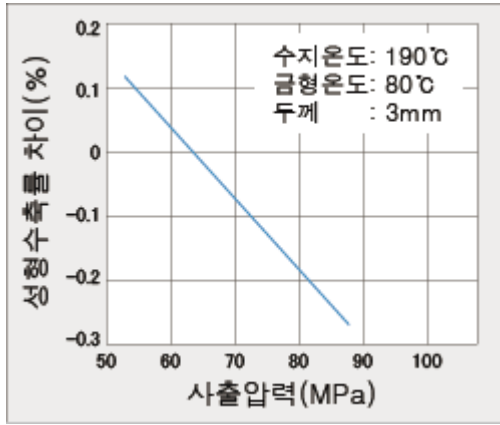
( )

: 50MPa  
 : 190  
 : 80  
 : 50mm/s  
 : 80x80mm

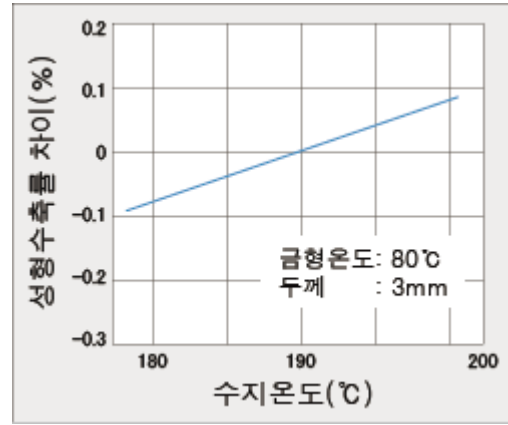
: 190  
 : 80  
 : 17mm/s  
 : 50x50mm 平板  
 : 1.0

6-1

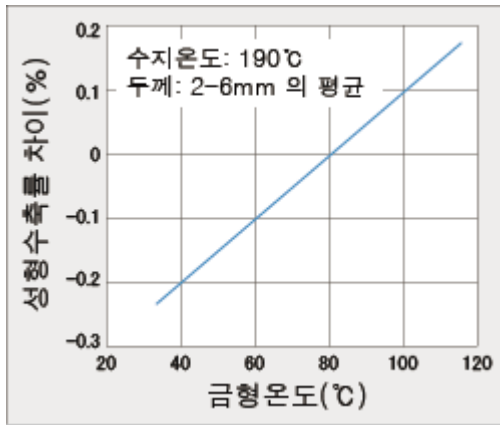
(Thickness)			



6-7



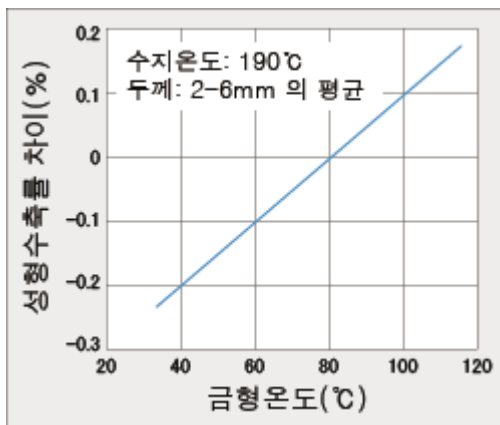
6-8



6-9

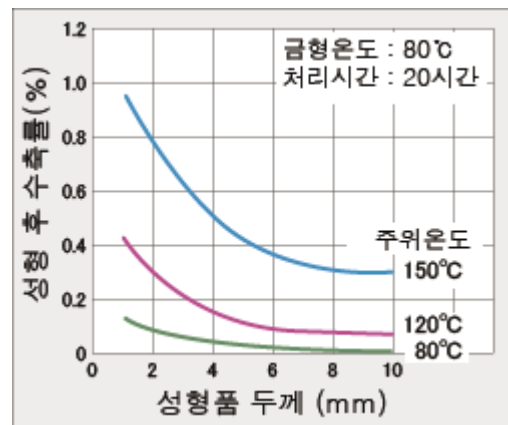
### 6.3

#### 6.3.1



6-10

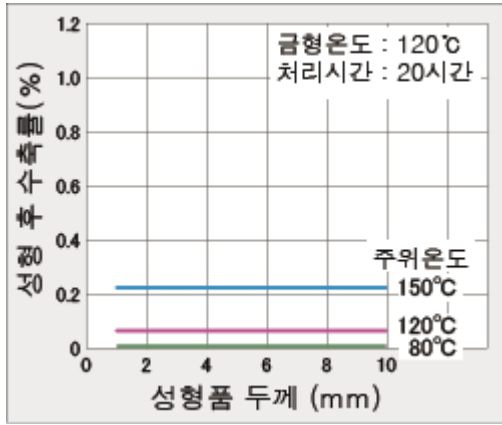
( 30 )



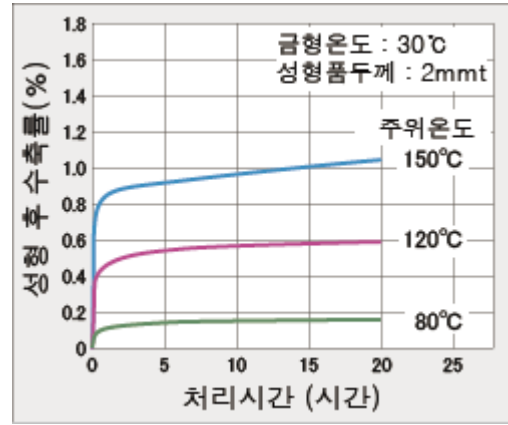
6-11

( 80 )





6-12 ( 120 )



6-13

2가 가

- 
- 

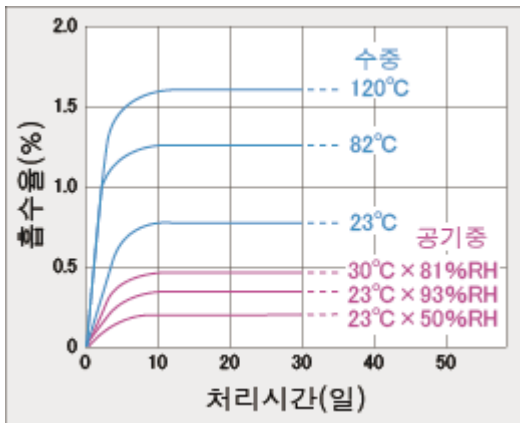
가

- 
- 
- 

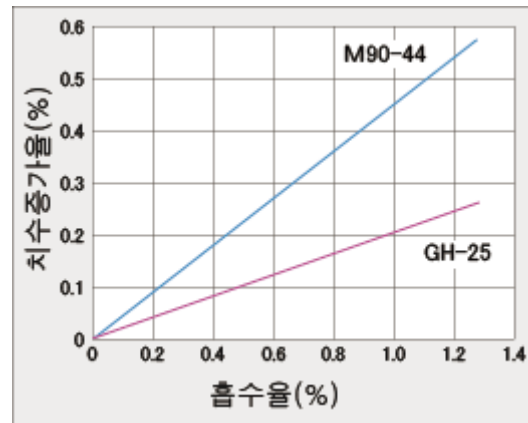
: 145 150

2 3mm : 30

6.3.2



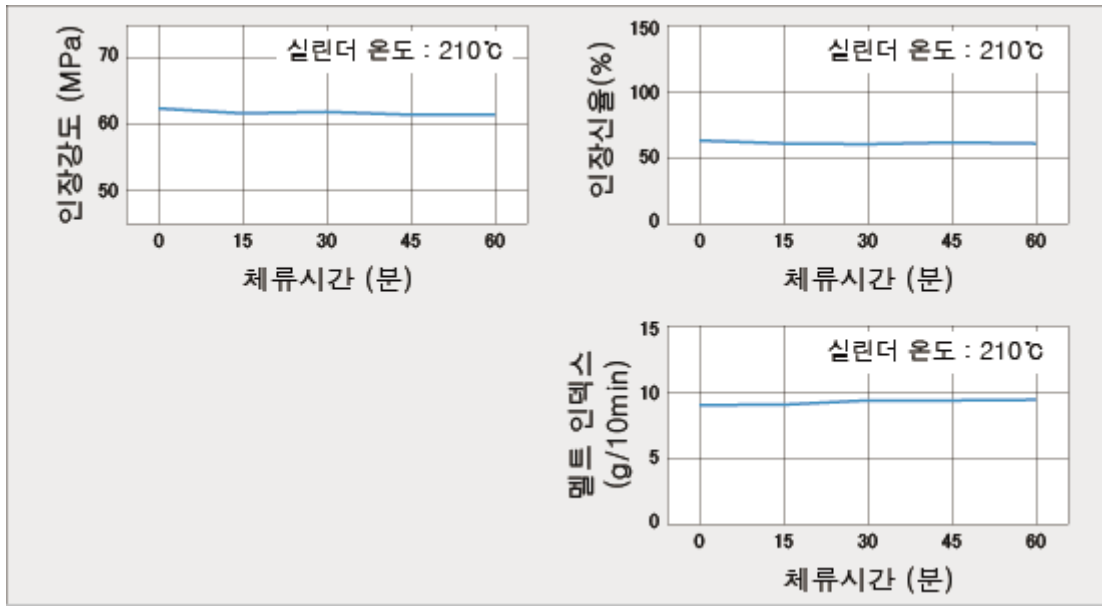
6-14



6-15

6.4

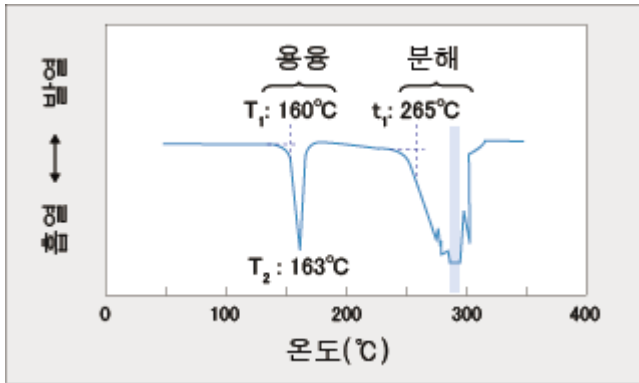
6.4.1



6-16

6.4.2

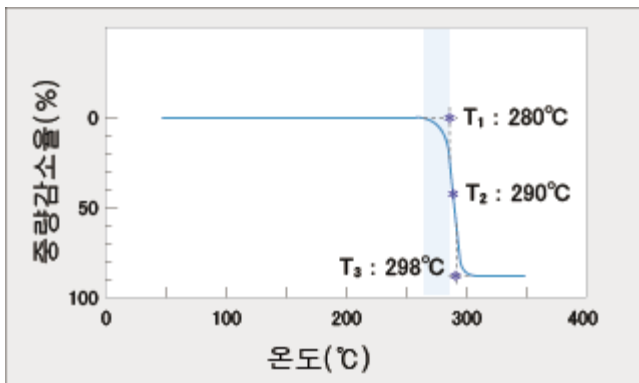
DSC( ) TG( ) DURACON® POM  
 6-17, 6-18 . 20 30 ,  
 10 , 가 .



: 5°C/min  
 : 14mg

T<sub>1</sub>:  
 T<sub>2</sub>:  
 t<sub>1</sub>:

6-17 DSC



: 5 /min  
 : 14mg

T<sub>1</sub>:  
 T<sub>2</sub>: 50%  
 T<sub>3</sub>:

6-18 TG

## 7.

### 7.1

- .

(Thickness)

(Core)

가

가

- 

(Thickness)가

- 

가

가

- 

가

1/3~1/2

### 7.2

(a)

DURACON® POM

7-1

SPI

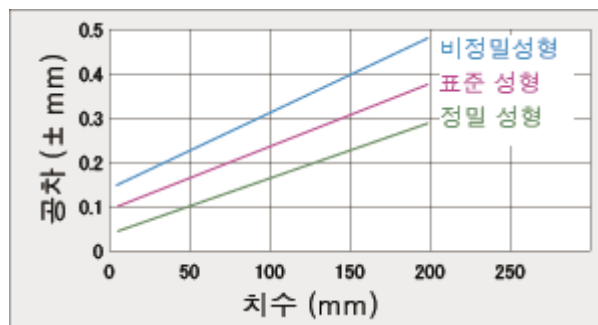
- 가 20 40mm
- 가 80 100mm

...  $\pm 0.20$  0.25%

...  $\pm 0.15\%$

가

가



7-1

(b)

7-1

		(mm)	$\pm 3\sigma_{n-1}$	(*) (%)		0.047 (49.045 $\pm$ 0.023) (*)
		49.025	0.006	0.012	-	
1	1	49.047	0.005	0.010	0.020	
	2	49.047	0.005	0.010		
	3	49.053	0.003	0.006		
2		49.055	0.005	0.010	-	
3		49.055	0.009	0.018	-	
4	1	49.049	0.007	0.014	0.024	
	2	49.057	0.006	0.012		
	3	49.055	0.006	0.014		
5		49.046	0.004	0.008	-	
6		49.046	0.004	0.008	-	
7		49.042	0.006	0.012	-	
8	1	49.039	0.006	0.012	0.020	
	2	49.045	0.005	0.010		
	3	49.045	0.006	0.012		
9		49.045	0.006	0.012	-	
10	1	49.046	0.006	0.012	0.020	
	2	49.040	0.004	0.008		
	3	49.039	0.006	0.012		
11		49.033	0.004	0.008	-	

(\*)  $\pm 3\sigma_{n-1} / \bar{x} \times 100$  (%)

(\*)  $\bar{x} \pm 3\sigma_{n-1}$  (mm)

7.3

(a)

- (Base) (Thickness)

•

H 가

H  
( 7-2, 7-2).

•

(Thickness) < (Thickness)  
(Thickness) > (Thickness)

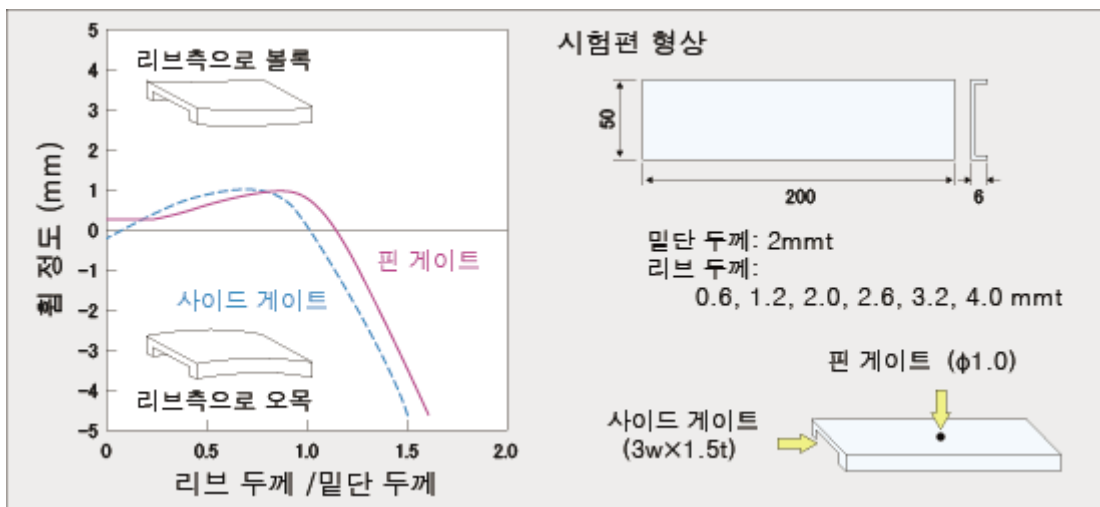
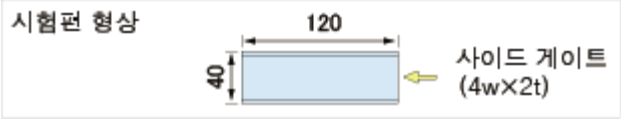
/ = 1 1.2

•

/

Table 7-2

		1	2	3	4	5	6
	30	0.04	0.06	0.29	-0.68	-0.55	0.04
	80	0.05	0.08	0.61	-0.44	-0.04	0.04



7-2

(b) L / D

L / D

•

가

•

1/3 1/2

L 가 T

D

(Thickness) /

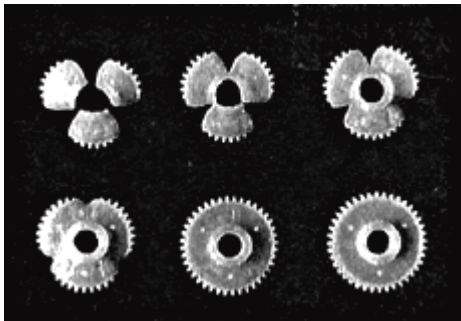
(Thickness) = 1/2

•

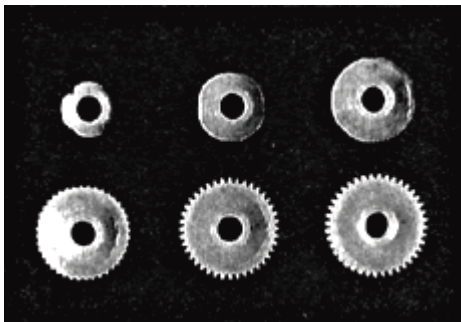


(d)

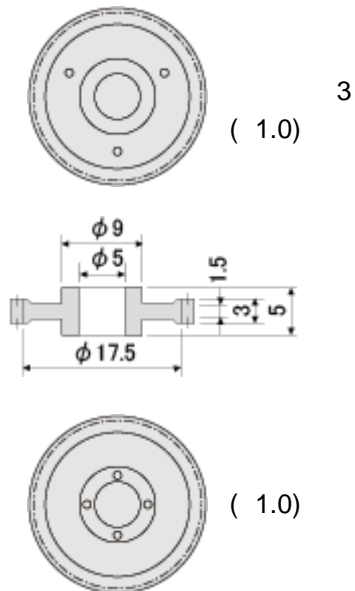
- >
- <
- H
- 1, 1
- 3 가 , 3 가
- 가 7-3



(a) 3



(b) 4



4

7-3 (Gear)

(e)

가

(Thickness)

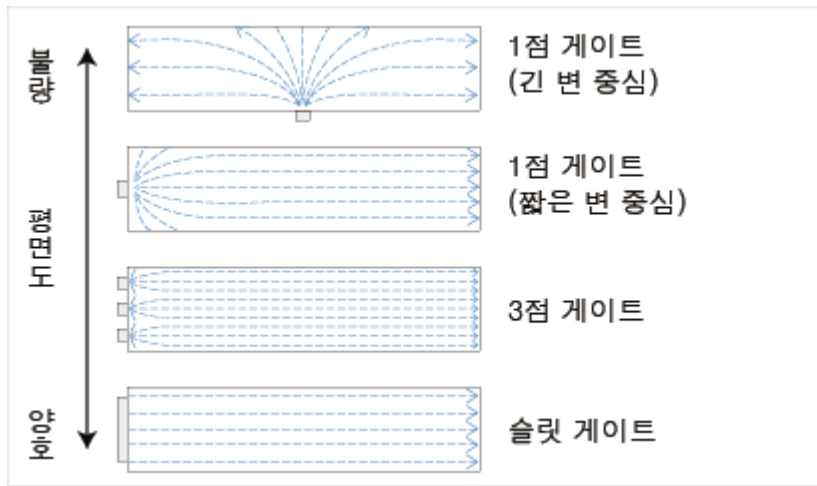
, 2

. 2

(f) 가

가

7-4



7-4 가

(g)

(1)

4-8

(2)

(3)

가

가

가

가

가

가

(4)

가

가



### 7.4

DURACON® POM

가 ( 7-5).

2

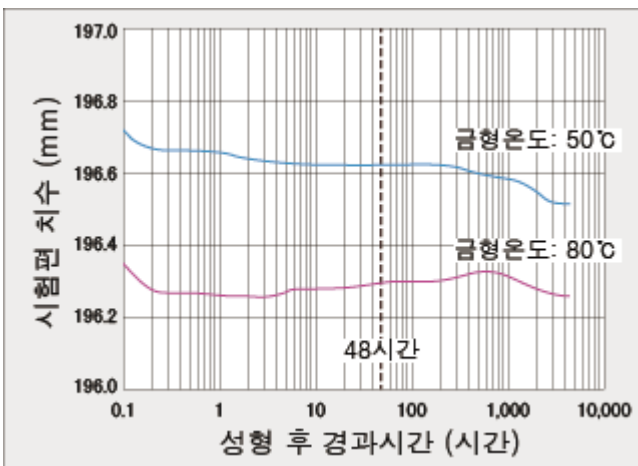
가

2

가

30

( , 가 ) 2



: 23 ×50%RH

: ASTM I

7-5

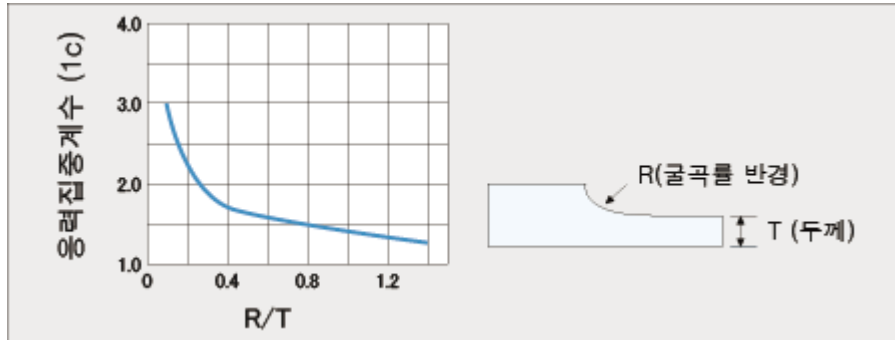
### 7.5

7-4

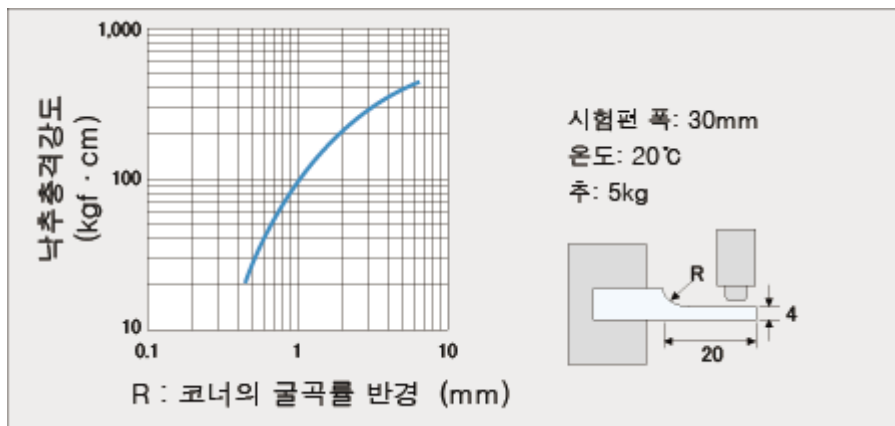
(Sharp Corner)	• ( 가 )
(Weld)	•
	• ,
가 가 (Thickness)	• ( )
(Thickness)	•
	• (Notch)
	• , ,
	•
	• 가
	• (Cold Slug)
	•
	• ( , , )
	• ( , 가 , )

(a)

가 ( 7-6, 7-7).



7-6



7-7

(b)

7-5

1/2 1/3

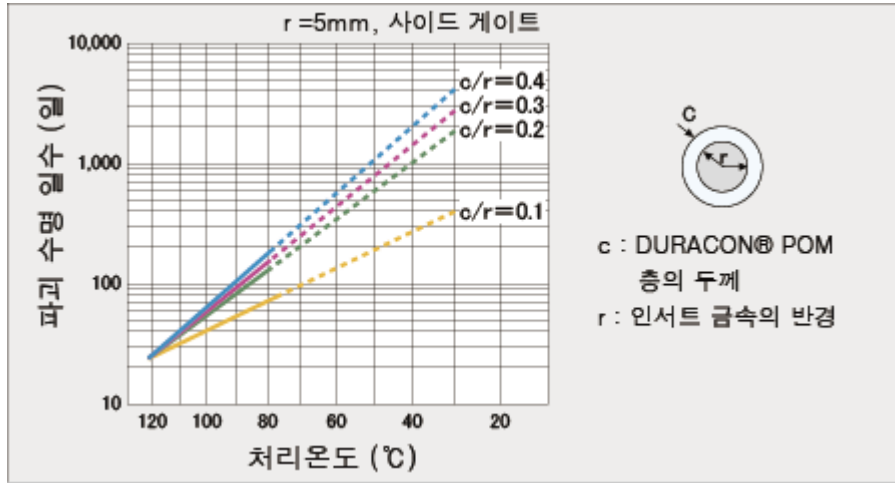
7-5 가

		(MPa),	(MPa),
M90-44		60	59
		58 (98%)	27 (46%)
GH-25		129	2.2
		55 (42%)	0.9 (41%)

: ISO (2mm)

(c) ,

가 , (Crack) 가  
(Thickness)  
가 가



7-8

## 8.

### 8.1

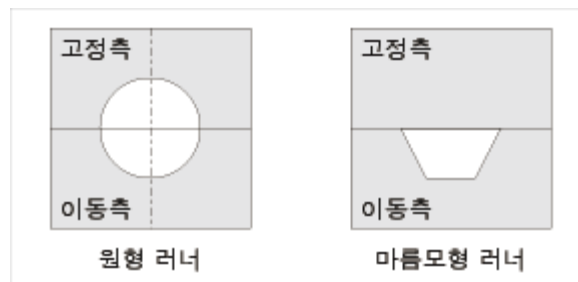
#### 8.1.1 (Cold Runner)

(a)

가

가 가

8-1



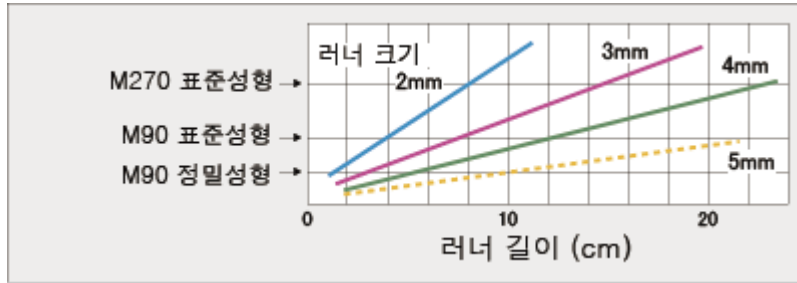
8-1

(b)

가

8-2

가



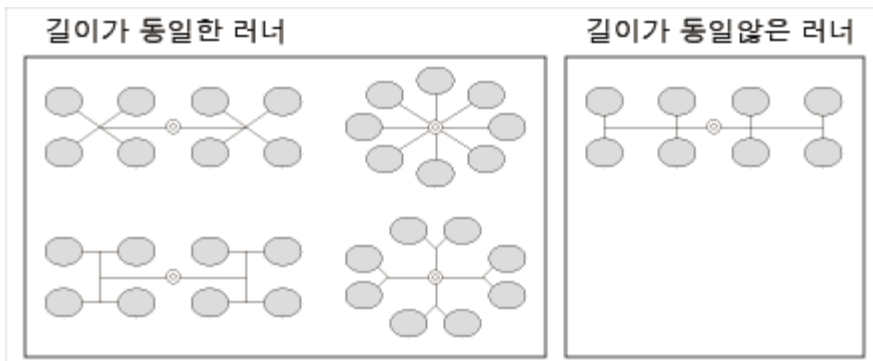
8-2

(c)

가

8-3

가



8-3 8

### 8.1.2 (Hot Runner)

가

(Hot Chip)

(Manifold)

(Recoloring),

가

가

( ),

DURACON® POM

## 8.2

- 60 70%
- 1 1.5 ( )
- ( )

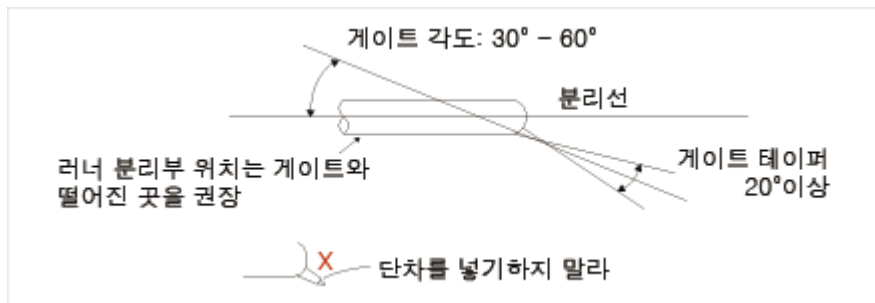
- (Thickness)

- 
- 
- 
- 가

DURACON® POM

가

8-4



8-4

## 8.3 (Draft)

DURACON® POM

(非晶性)

- 0.25° 0.5° 가 1°  
(Knock Out) , (Knock Pin) ,

### 8.4 (Under Cut)

(Snap-Fit)

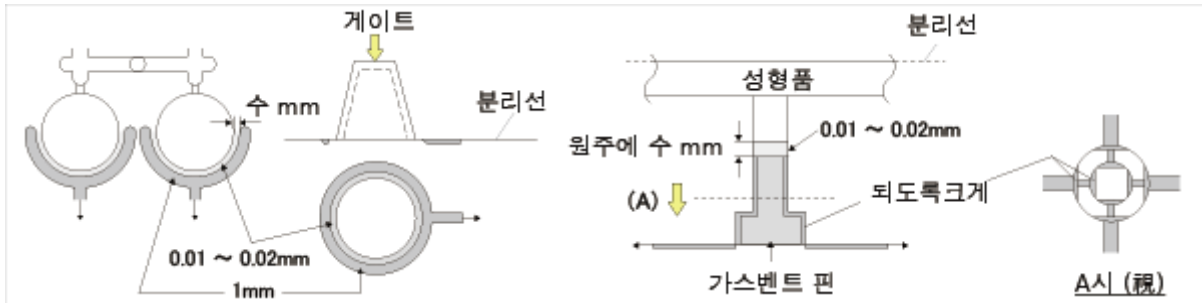
- 가 . , .
- M90-44 2.5 3%
- GH-25 0.5%

### 8.5 가 (Gas Vent)

가 가 가  
가 가 가 . 가 가

8-5

mm 1/100 2/100mm 가 , 1mm



8-5 가

8.6

가

• 가

•

(a) ( , )

(b) 가

( 가 가 )

(c)

( , )

• (

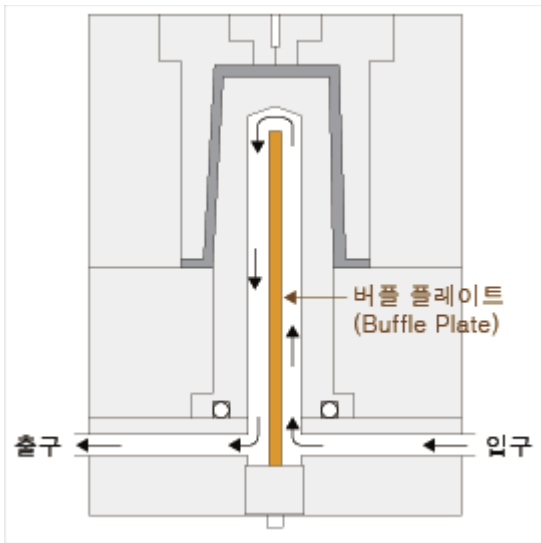
)

(a) ( 8-6, 8-7)

(b) ( 8-8)

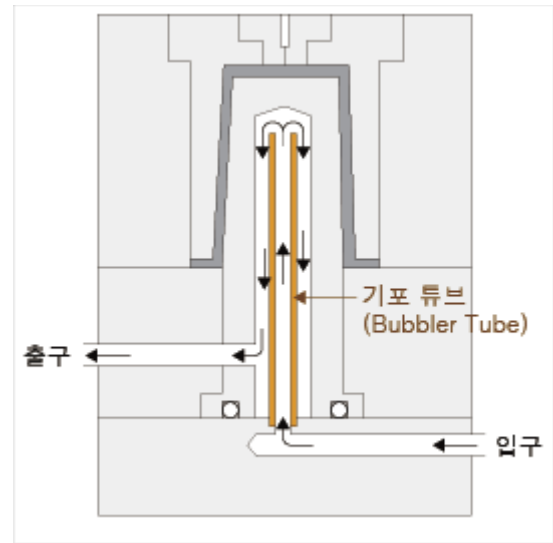
(c) ( 8-9)

(d) ( 8-10)



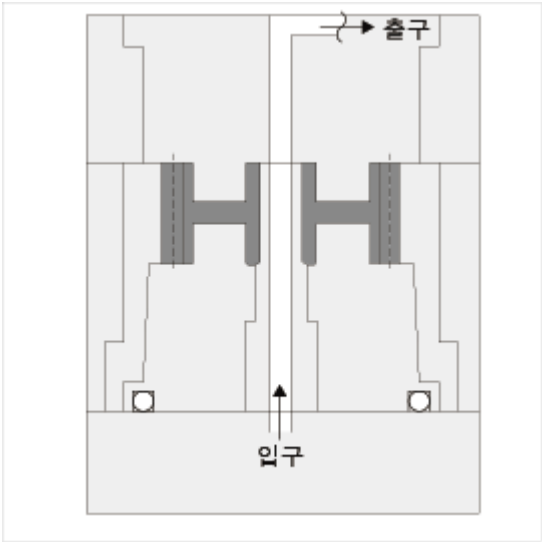
8-6

( )

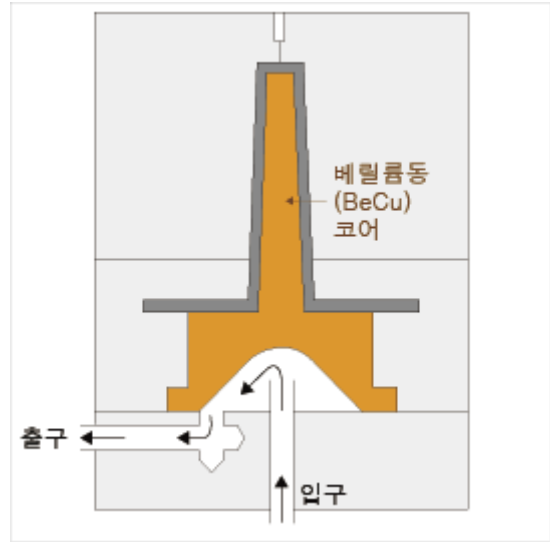


8-7

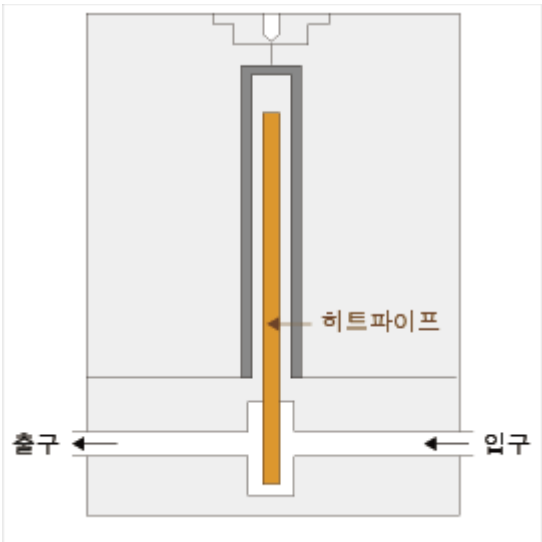
( )



8-8



8-9



8-10

8.7

DURACON® POM

- 가
- ( ) 가 , 가

S55C < NAK-55, SNC415 < SKD-11 <

( )

SUS440C < PSL

( )



8-1

	(W/m · )
( )	386
20C	121
275C	109
( )	221
A7075	151
(ZAS)	109
	53
SKD 61	34
SKD 11	27
13Cr	26
18-8	16

8-2

	JIS	HRC							가	
	S55C	13	D	D	A'	-	A"	C	B	B'
	SCM440	28	D'	D'	B'	-	A	B	B'	B'
	SCM440	33	C	C	A	-	A'	C'	B	A
	SNCM420	33	C	D'	A'	-	B'	B'	A'	A
	SUS	33	C	A'	A		D'	A'	A	A
	SUS	33	C	A	A		B	B	A	A
	SUS630	35	C'	A'	A		D'	B'	B'	A
	SKD61	40	B	B	B	-	B'	C	C'	B
	AISIP21	40	B	C	D'	-	A'	A	B	B'
	AISIP21	40	B	B	C'	-	B'	A'	A"	B'
	SKD11	60	A'	B	C'	B	B	A'	A	D
	SKD12	57	A	B	C'	B'	B'	C'	C	C
	SKD61	50	A	B	B	B	A	B'	B'	B
	SUS420	52	A	A'	B	A'	B	A"	A'	B
	SUS440C	57	A'	A	C	A	C'	A'	A	D
		53	A	B	A"	A'	C'	A"	A"	A"

가 : ( ) A" > A' > A > B' > B > C' > C > D' > D ( )

# 9.

9-1

<p>1.</p>	<p>(1) 가  (Jetting)</p>	<p>&lt;1 &gt;  a. b. c. d.  &lt;2 &gt;  e. f. ( ). • • 가 g. (Tab Gate)</p>
	<p>(2) 가  (Thickness)</p>	<p>a. R b. (Thickness)가 R</p>
	<p>(3) 가</p>	<p>가</p>
<p>2. ,</p>	<p>(1)</p>	<p>a. b. , c. d.</p>
	<p>(2) 가</p>	<p>a. 가 b. c.</p>
<p>3.</p>		<p>a. ( ) b. c. d. 가 e. (Relief) f. (Thickness)</p>

4. (Silver Streak)	(1) 가 가	a. (100 ). b. c. d. 가 e. 가
	(2) (Air Pocket)	
	(3) PE, PP	
5.	(Thickness) 가 , 가	a. b. , , c. d. e. (Thickness) 1/3 f. (Thickness)
6.	(1) PE, PP	
	(2)	a. b. c.
	(3) 가	a. b. 가 ( ).
7.	(1)	< > a. (100 ). b. c. 가 d. < > e.
	(2)	a. b. c. , , d. 가
8.	가 가 , .	a. (Thickness)가 가 b. , , , 50 60% c. d. e. f.

가

가

•가

'SDS'

DURACON®

가

가

Address: #1713, Hanshin Inter Valley 24, 707-34, Yeoksam-dong, Gangnam-gu, Seoul 06211, Korea

Phone: +82-2-2183-2270

Fax: +82-2-2183-2273

**<http://korea.polyplastics.com/>**