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(A)

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(87)	2001 07 12

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가

가

가

가

가

가

AP ARIPO : 가

EA :

EP :

OA OAPI : 가

(30) 99/16844 1999 12 30 (FR)

(71)	63000	-	23		
	-	- 1763	-	10	12

(72)	가	- 63100	-	34
		- 63200	20	
		- 69008		2

(74)

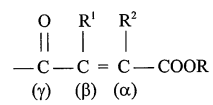
:

(54)

(/)

X(, X , (/) -)

X



X ,

R, R¹ R² , 1가 , R¹ R² .

, 가 , .

1

, , 가 , .

가 (semi - finished product) , (tread)
(white filler) .

, , 가 , ,

(hysteresis)

, (starring agent) ,

가 , 가

가

가

(" 가 ")

가

0 501 227

가

0 810 258

(Al₂O₃)

가

가

" (/)
 / 가
 Y - W - X[, Y
 , X
) , W Y X

(OH)

(" Y")
 (" X"

Y

X

, (/)

가

2 094 859

- SH

가

, " (scorching)"

가

가

가

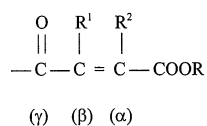
. - SH

가 , 2 206 330
 4 002 594 가 .
 , [: 2 206 330 , 3
 842 111 , 3 873 489 , 3 978 103 3 997 581]
 , - (C₁ - C₄)
 , 가
 가 (/) - 3 - 가 (TESPT
 , 가 [: (Degussa) Si69]. ,
 [: 5 652 310 ,
 5 684 171 5 684 172].

가
 TESPT
 , 가 ,
 (JP 1989/2938
 5), , TESPT

, (A),
 (white filler)(B), " Y" " X" 2 Y
 X
 (/) (C) 가 가 , X
 X - ,
 가 .

X



X ,
 R, R¹ R² , 1가 , R¹ R²
 .
 가
 , 가 , , ,
 , , ,
 가 , 가 .

, ,

(i) (A) (ii) (

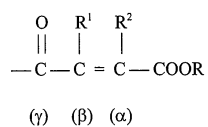
B) (iii) "Y" "X" 2 , Y (

X X /) (C) ,

가 110 190 -

:

X



X ,

R, R¹ R² , 17가 , R¹ R² .

(/) "Y" "X" 2 (,

C)(, Y X X X -

) .

(i) (A) (ii) (

B) (iii) "Y" "X" 2 , Y (

X X /) (

C) , 가 110 190 -

:

I.

I - 1 가

AFNOR - NFT - 43005(1980 11) 가 . 가
 : 가 (,) 100 가 . 1 가
 , 2rpm , 4
 가 (ML 1+4) " (Mooney unit)" (MU, 1 MU=0.83 .) .

I - 2 (scorching)

AFNOR - NFT - 43004(1980 11) 130 .
 T5 가 ,
 5 (MU) 가 .

I - 3

가 . AFNOR - NFT -
 460002(1988 9) . 10% (M10), 100% (M100) 300% (M300)
 (nominal secant moduli)(MPa) 2 (,) (MPa)
 (%) . AFNOR - NFT - 40101(1979 12)

가 (: 1 3),
 1

II.

A, (i) ()
), (ii) (B), (iii) (/)
 (C,).
 , " " , ,
 가 ,
 / .

II - 1. (A)

, " " (, , 2 -
) (,) .
 , " " () 15%(%)

가 가 , 가
 가 :

(a) 4 12 ,

(b) .

" " , " " ()

) 50% .

(A) (BR), (NR),
(IR), , ,

, - - , - , -

- , -

. , 가 - 1,2 4% 80% , - 1,4 80%

. - 1,4 가 .

, 2 8 20
가 가 .

, -, - , " - "

- , - , - , 99 20 %

- 1 80 % .

, - (" SBR"), - (BIR),
(SBIR) 가 .
, - (- IIR), - (SIR),
(BIR) - (SBIR) 가 .

- - 5 50 % 20 40 %, - 1,2 4 65 %, - 1,4 20 80 % 가
. , 5 90 %, (T_g) - 40 -
80 가 . - , 5 50 %

- 25 -50 가 가 . - - ,
15 60 %, 20 50 %, 5 50 %, 20
40 %, 1,2 4 85 %, - 1,4 6 8
0 %, - 1,2 + - 3,4 5 70 %, - 1,4 10
50 %, 20 - 70 - -

가 가 .

, A , , , - ,
- , - .

/ (randomising agent)

/ 가 , , / , .

()

- , A , SBR, SBR/BR, SBR/NR(SBR/IR) BR/NR(B
R/IR) () . SBR , 20 30 % ,
15 65 % , - 1,4 15 75 % - 20 - 55 SBR
, SBR , 90% - 1,4
(BR) .

, " (heavy duty)" , , (, ,), -
, A , , (- , ,
- , -) .
A SBR .

(50 %) (A)가 ,

, A , .

, (: 가) A , A , -

II - 2. (B)

. , 80 % , 50 % ,

, " " () " " (,)
, " (clear)" , ,

, (SiO₂) (Al₂O₃) , 2

450m²/g , 30 400m²/g , BET CTAB (" HD")가 , 가 ,

5 MP 1115 MP, PPG (Akzo) Perkasil KS 430, (Degussa) BV 3380, (Rhodia) Zeosil 116
35 088 " " (Huber) Zeopol 8741 8745, 0 7

/g, 60 250m²/g , 0 810 258 BET 30 400m²
D65CR 가 500nm, 200nm (Baikowski) A125, CR125

가 (ball) /

60 250m²/g, 80 200m²/g , BET

()
HAF, ISAF SAF
N115, N134, N234, N339, N347 N375

20 150phr (, +) 10 200phr,
120phr, 가 40 100phr , 가 , 30

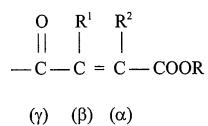
, BET (Brunauer) , (Emmet) (Teller)
[: " The Journal of the American Chemical Society" , Vol. 60, page 309, February 1938]
AFNOR - NFT - 45007(1987 11) , CTAB AFNOR - NFT
- 45007(1987 11)

II - 3. (C)

가 , (/) " Y" " X" 2
Y , X

X
X

X



X ,

R, R¹ R²
1가 , R¹ R² , 1 6 .

" Y , "

(OR¹) () (, R¹ 1가 ,)

. R¹ 1 18 , C₁₋₆ , C₂₋₆ , C₅₋₈ , C₁₋₁₈ , C₂₋₁₈ , C₅₋₁₈

C₆₋₁₈ ,

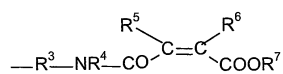
X

X

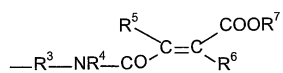
I

II

I



II



I II ,

R³ 1 10 2가 ,

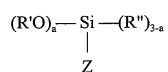
R⁴, R⁵ R⁶ , , 1 6

1가 ,

R⁷ 1 6 1가 .

, III 가 ,

III



III ,

R' , 5 8 , 1 4 , 2 6 , 1가 ,

R" , 1 6 , 5 8 , 1가 ,

Z - L - X(, L , 1 16 , 2가 , S, O N) ,

a 1, 2 3 .

III 가 , (Y) (R'O)_a , L L - R³ - NR⁴ -). (: I II

I, II III :

- III R' , , n- , , n- , CH₃OCH₂ - , CH₃OCH₂CH₂ - CH₃O CH(CH₃)CH₂ - ,

- III R" , , n- , , n- , n- , ,

- I II R³ - (CH₂)₂ - , - (CH₂)₃ - , - (CH₂)₄ - , - CH₂ - CH(CH₃) - , - (CH₂)₂ - CH(CH₃) - (CH₂) - , - (CH₂)₃ - O - (CH₂)₃ - - (CH₂)₃ - O - CH₂ - CH(CH₃) - CH₂ - ,

- I II R⁴, R⁵ R⁶ , , , n- , n- ,

- I II R⁷ , , n- .

, :

- R' , , n- ,

- R" ,

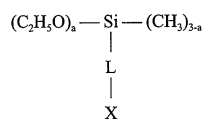
- R³ - (CH₂)₂ - - (CH₂)₃ - ,

- R⁴, R⁵ R⁶ ,

- R⁷ .

III , III - 1 :

III - 1



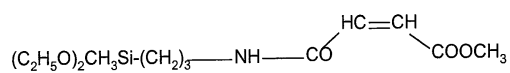
III - 1 ,

L - R³ - NR⁴ (I II) ,

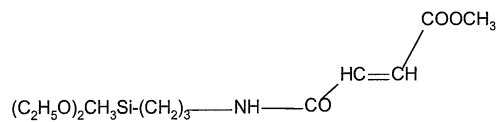
X I II .

III - 1 , a가 2 , L - (CH₂)₃ - NH - , X가 - CO - CH=CH - COOCH₃
 , Z가 - L - X, - (CH₂)₃ - NH - CO - CH=CH - COOH₃ N[- (-)]
 [III - 2] N[- (-)] [III - 3]

III - 2



III - 3



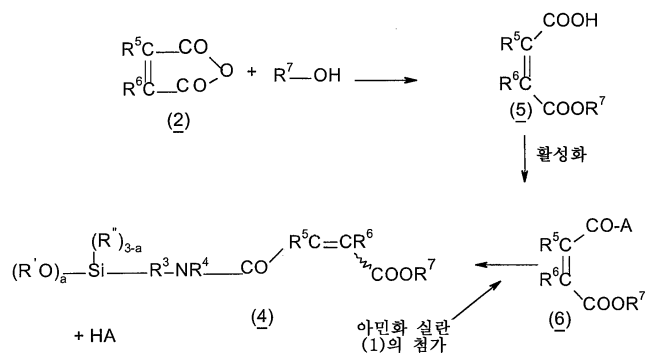
III, III - 2 III - 3 - - .

(1) (5) (6) 가

R⁷ - OH (2) (1),, (5)
(6) (2),

가 (4) , (1) (6) 가 ,
(3)(, (6) A
) .

1



(1) (3)

, 가 : , 가

- (1) : J. Med. Chem., 1983, 26, pages 174 - 181,

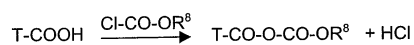
- (2) (3) : John JONES, Amino Acid and Peptide Synthesis, pages 25 - 41, Oxford University Press, 1994.

(5) 가 가 , 가

:

(i) , (T - CO -
- O - CO - OR⁸ -),

2



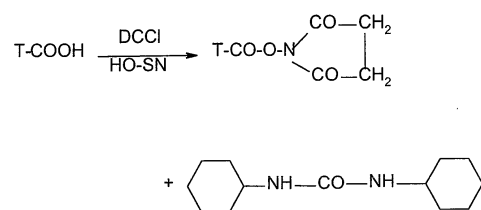
2 ,

T - R⁵C=CR⁶ - COOR⁷ ,

R⁸ , 1 3 .

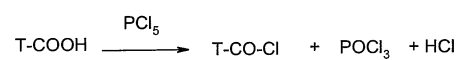
(2i) N - (HO - SN) ,
(DCCI) ,

3



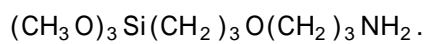
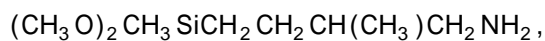
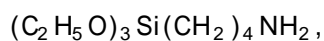
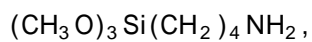
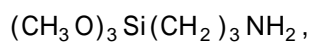
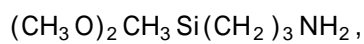
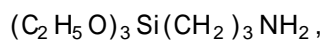
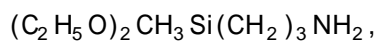
(3i) ,
(: - Cl),

4



(i) (2i)가 .

가 (1) :



X

C

,

.

C

0.5

%

20

%

.

가

,

가

.

,

C

3

15 %,

5

12

%

.

C

가

,

.

, , 가 , ,
 X C가 10 % , 8
 % .

, (C) (" Y")
 , " " " X" .

II - 4. 가

, , 가 , , 가 , 가 ,
 , , , , .

, (C) ,
 (, Y) 가
 (:), 1 , 2 3 (: -), 가
 [: , - - 가 (, , - -)] . ,
 , C .

II - 6.

- 2 : ,
 0 180 1 (, ") 110 190 , 13
) , (T_{max}) , 60 100 ,
 [: 110 , 0 501 227]. , 가 가

B C A
 , 130 180 , 110 190 ,
 - .

, - 1 () ,
 가 가 가 , 가
 . - 2 가
 (100) , 가

2 10 .

, , 가 ,
 , 5 15 ().

가

가 () 130 200 , 가
가 , 5 90 .

), " 가 " (,) " " 가 (가 가
) .


(,

III.


III - 1.

III

1)

2 (698.1g 7.12mol) , 70 가
(221.4g 6.92mol) 가
20 23 , 1 10.10² Pa ,
23  (786.9g)가 (: 86%).

2)

가 2 (219.17g 1.
685mol) , (CH₂Cl₂, 950g) , - 60 , N -
(187.58g 1.854mol) 4 가 . 가가 , - 60
(Cl - CO - OC₂H₅, 201.21g 1.854mol) 10 가 .
 10

(C₂H₅O)₂CH₃Si(CH₂)₃NH₂ (322.43g 1.685mol) 15 가
가 . 23 .

2

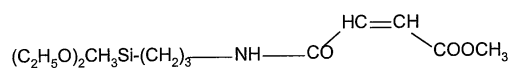
/ (50/50)

(29 Si) NMR NMR ,

:

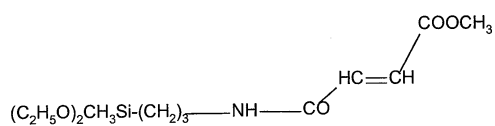
- III - 2 - $\text{CH}_3\text{ZSi}(\text{OC}_2\text{H}_5)_2 \quad \text{D}(\text{OC}_2\text{H}_5)_2$
82 % (83.2 %),

III - 2



- III - 3 - $\text{CH}_3\text{ZSi}(\text{OC}_2\text{H}_5)_2 \quad \text{D}(\text{OC}_2\text{H}_5)$
2 9 % (9.2 %),

III - 3



- $\text{CH}_3\text{ZSiO}_{2/2} \quad \text{D}(\text{OC}_2\text{H}_5)$ 9 % (7.6 %).

$$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \\ \text{C}_2\text{H}_5\text{O}-\text{SiO}-\text{SiO}-\text{Si}-\text{OC}_2\text{H}_5 \\ | \quad | \quad | \\ 2 \quad 2 \quad 2 \end{array}$$

3 , Z - $(\text{CH}_2)_3 - \text{NH} - \text{CO} - \text{CH}=\text{CH} - \text{COOCH}_3$, L - $(\text{CH}_2)_3 - \text{NH} -$, X
- $\text{CO} - \text{CH}=\text{CH} - \text{COOCH}_3$.

III - 2.

: , , , 70% 60
 , 가 , 2 - () 165 " 가"
 (homo finisher)] 30 가 , 3 4 ().

, (2 3mm)
 , , 가 / ,

, (/) 30 80phr
 , , .

III - 3.

A) 1

- TESPT
(/) .
- 2 . , ()
- 2 :
- 1 : TESPT
 - 2 : (82mol%) N[- (-)] (III - 2)
 , .
- $[\begin{matrix} 2 \\ , Y \end{matrix} Si(OR')_a (\begin{matrix} , a \\ 1, 2 \end{matrix} 3) \begin{matrix} ' , ' \\ , , \end{matrix}]$ 가 , , Y .
- , TESPT 10% .
- 1 2 (1 phr) (150 25)
 . 1 (%) (MPa) ,
 1 2 C1 C2 . 가 .
- :
- (T5) (20) , .
 - 가 , 가
(50MU) .
 - , (2) , (M100 M300) (M300 /M100)
 가 .
 - 가(+ 7)가 -
 가 , (/)
- 1 : (C2) () ,
(100%) , , .
- B) 2
- , (0 810 258)
(50/50) .
- 2 . 2
:
- 3 : TESPT (4phr)

- 4 : (4.5phr)
- 3 , 4 . ,
(65phr) (8% .)
- 3 4 (150 20) . 2 (%)
(MPa) , 3 4 C3 C4 .
- 4 :
- (10 T5),
- 가 (50MU), 가 .
- (M3000) (M3000/M100)
- 가 가(+ 8) 가
- .
- 2 : C3 C4 100 300%
(300%) C3 , C4가 () .
- C) 3
- 0 784 072 , - ' - 가 ,
(C) .
- 가 () 가
, 가 ()
- 2 :
- 5() : TESPT(4phr)
- 6() : (3phr) + 가 (1.2phr)
, 8% (6%) .
- 5 6 (30 150) . 3 (%)
(MPa) , 5 6 C5 C6 .
- 6
- :

- 가 ,

- ,

M100 M300
C5

(M300/M100) . 3 (6
).

가 , .

(X) ,
(/) ,

TESPT

, 가

[1]

	1	2
NR(1) (2) (3) (4)ZnO (5)	100504 - 32.51.9	10050 - 4.532.51.9
CBS(6)	1.51.8	1.51.8

(1)

(2) (BET CTAB: 150 160m²/g) (Rhodia) " HD" - Zeosil 116
5MP

(3) (Degussa) TESPT - Si69

(4) (III - 2)

(5) N - 1,3 - - N - - -

(6) N - - 2 -

[2]

	1	2
(MU)T5() M10(MPa)M100(MPa)M300(MPa) M300/M100 (MPa) (%)	33215.101.741.761.0131620	40227.302.232.601.1731540

[3]

	3	4
NR(1) (2) (7) (3) (4)ZnO (5)	10025404 - 32.51.9	1002540 - 4.532.51.9
CBS(6)	1.51.8	1.51.8

(1) (6): 1

(7) (Baikowski) CR125(: BET 105m²/g)

[4]

	3	4
(MU)T5() M10(MPa)M100(MPa)M300(MPa) M300/M100 (MPa) (%)	38125.23.36.72.030625	46105.33.07.12.429573

[5]

	5	6
NR(1) (2) (3) (4)PDMS(8)ZnO (5)	100504 - - 32.51.9	10050 - 31.232.51.9
CBS(6)	1.51.8	1.51.8

(1) (6): 1

(8) : , - - 가 (H48V50)

[6]

	5	6
(MU)T5() M10(MPa)M100(MPa)M300(MPa)M300/M100 (MPa) (%)	36185.23.67.62.130633	32207.24.410.52.430555

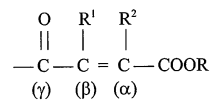
(57)

1.

X" 2 (A), (white filler)(B), " Y" "
Y (/) (C)
가 ,

X X -
가 .

X



X ,

R, R¹ R² , 1가 , R¹ R² .

2.

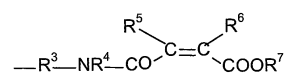
1 , A가 , , , .

3.

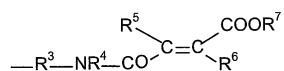
2 , 가 - , - ,
- , - -
.

4.

1 3 , X I -
II -
I



II



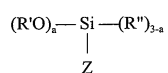
I II ,

R³ 1 10 2가 ,R⁴, R⁵ R⁶ 17가 , , 1 6R⁷ 1 6 17가 .

5.

4 , C가 III .

III



III ,

R' , 5 8 , 1 4 17가 , 2 6

R'' 17가 , 1 6 , 5 8

Z - L - X(, L , S, O N 1 16 2가) ,

a 1, 2 3 .

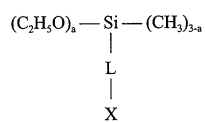
6.

4 5 , III R' , , n- , n- , CH₃OCH₂- ,
 CH₃OCH₂CH₂- CH₃OCH(CH₃)CH₂- , III R" 가 , n- ,
 , n- , n- , I II R³ - (CH₂)₂ - ,
 - (CH₂)₃ - , - (CH₂)₄ - , - CH₂ - CH(CH₃) - , - (CH₂)₂ - CH(CH₃) - (CH₂) - , - (CH₂)₃ - O - (CH₂)₃ -
 (CH₂)₃ - O - CH₂ - CH(CH₃) - CH₂ - , I II R⁴, R⁵ R⁶ ,
 , n- , n- , I II R⁷ , ,
 n- .

7.

5 6 , III III - 1 .

III - 1



III - 1 ,

L - R³ - NR⁴ (I II) ,

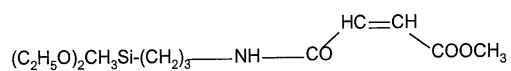
X I - II - .

8.

7 , III - 2 N[- (-)]

.

III - 2

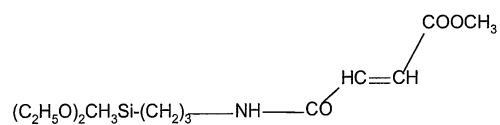


9.

7 , III - 3 N[- (-)]

.

III - 3



10.

1 9 , B 10 200phr .

11.

1 10 , C , B , 0.5 20 % .

12.

11 , C , B , 10 % .

13.

1 12 , B가 .

14.

1 12 , B가 .

15.

1 14 , B가 .

16.

1 14 , B가 .

17.

2 16 , A가 , , .

18.

17 , A가 .

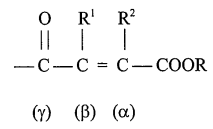
19.

1 18 , 가 .

20.

(i) Y" " X" 2 (A) (ii) Y (B) (iii) " X
X
- 가 110 190 (/) (C) , , .

X



X ,

R, R¹ R² , 17가 , R¹ R² .

21.

20 , 가 130 180 .

22.

, , (crown plies), , (carcass plies), , , (semi - finished product) , 1 18 .

23.

1 18 .

24.

19 .

25.

, , , , 1 18 , , , 가 .

26.

25 , 가 .

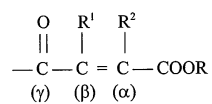
27.

26 , 17 18 .

28.

Y , " Y" " X" (2 , X
X
(
X / -)
(C) (/ -) .

X



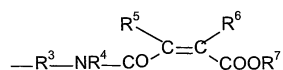
X ,

R, R¹ R² , 1가 , R¹ R² .

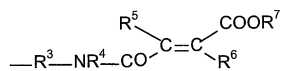
29.

28 , X I - II - .

I



II



I II ,

R³ 1 10 2가 ,

R⁴, R⁵ R⁶ , , 1 6
1가 ,

R⁷ 1 6 1가 .

30.

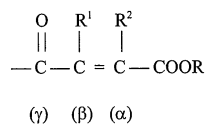
28 29 , 가 , , , , , .

31.

(i) " X" 2 (A) (ii) Y (B) (iii) " Y" X

- 가 110 190 ($\frac{X}{/}$) (C) , X , .

X



X ,

R, R¹ R² , 1가 , R¹ R² .

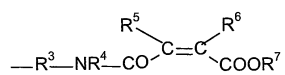
32.

31 , 가 130 180 .

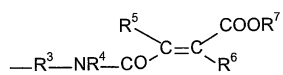
33.

31 32 , X I - II

I



II



I II ,

R³ 1 10 2가 ,

R⁴ , R⁵ R⁶ , , 1 6
1가 ,

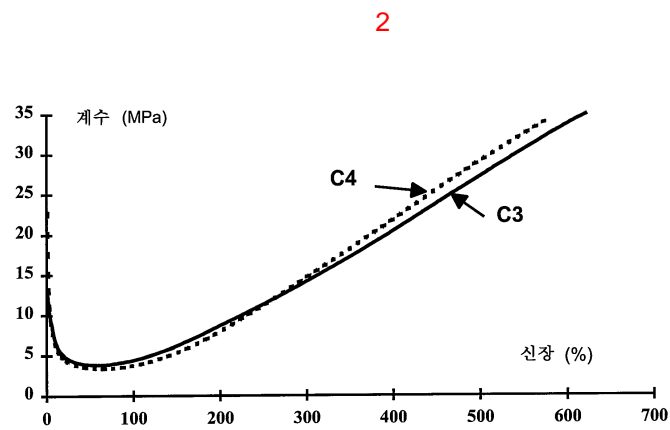
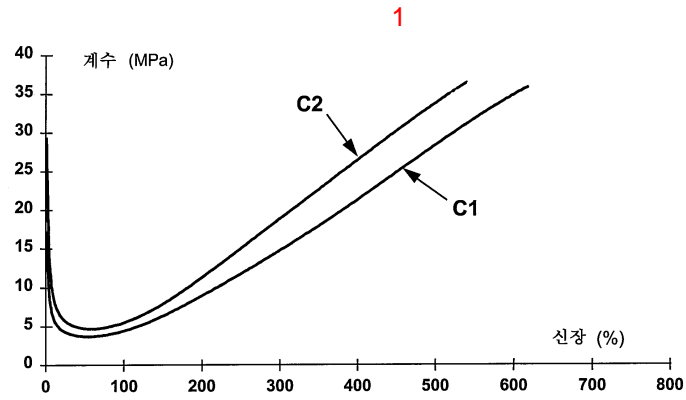
R⁷ 1 6 1가 .

34.

31

33

가



3

