



(MSDS)

,2016,3M Company.

가 (MSDS) 3M
 가 (1)
 가 (2)

3M

가

30-1026-1
 : 2016/11/07

2.03
 : 2016/10/22

(MSDS) 39-1 , 41

1.

1.1.
 #77

1.2.

1.3.

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82, 19 ()150-705

82-2-3771-4114
 www.3m.com/kr
 : 82-80-033-4114

2.

2.1. .

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 가 : 가 .

(1): 1.
 (1): 3.
 (): 2.

2.2.

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| 가 |



H222
H280
H229

가 ; 가
: 가

H336

H370

H373

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P210
P211
P251
P260
P261
P271
P270

/ /가 / / /
/ /가 / / /
가

P264

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P304 + P340

가

P308 + P311
P321

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P312
P314

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P410 + P403
P410 + P412
P403 + P233
P405

가
50

가
가

#77

P501 / / 가/ / .

2.3. .

3.

			(%)
2-METHYLPENTANE	ISOHEXANE	107-83-5	15 - 25
가 (LPG)		68476-85-7	10 - 20
CYCLOPENTANE		287-92-3	5 - 15
CYCLOHEXANE	BENZENE HYDRIDE	110-82-7	5 - 15
BUTADIENE-STYRENE POLYMER			5 - 10
POLYMERIC TERPENE			5 - 10
ISOBUTANE	2-METHYLPROPANE	75-28-5	5 - 10
DIMETHYL ETHER	DIMETHYL OXIDE	115-10-6	5 - 10
ROSIN ESTER			1 - 5
METHYLCYCLOPENTANE	MCP	96-37-7	1 - 5
Calcium Carbonate			0.5 - 1
N-HEXANE	N-HEXANE	110-54-3	0.5 - 1

4.

4.1.

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4.2. 가 ,
11.1

4.3. 가 가
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5.

5.1. ()

5.2. 가 (,)

5.3.

6.

6.1. 가
가 가 (MSDS) 8
가 가
가 가 (Foam)
(Aqueous film forming foam)
(Vermiculite), 가 가 가 가 가
(label) (MSDS)

7.

7.1.

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7.2. () 가 . 50C/122F

8.

8.1. ,

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				가
2-METHYLPENTANE	107-83-5	ACGIH	TWA: 500 ppm; STEL: 1000 ppm	
HEXANE (ISOMERS OTHER THAN N-HEXANE)	107-83-5	OELs	TWA(8 hours):1800 mg/m3(500 ppm);STEL(15 minutes):3600 mg/m3(1000 ppm)	
N-HEXANE	110-54-3	OELs	TWA(8 hours):180 mg/m3(50 ppm)	
N-HEXANE	110-54-3	ACGIH	TWA: 50 ppm	
CYCLOHEXANE	110-82-7	ACGIH	TWA:100 ppm	
CYCLOHEXANE	110-82-7	OELs	TWA(8 hours):700 mg/m3(200 ppm)	
DIMETHYL ETHER	115-10-6	AIHA	TWA:1880 mg/m3(1000 ppm)	
CYCLOPENTANE	287-92-3	ACGIH	TWA:600 ppm	
CYCLOPENTANE	287-92-3	OELs	TWA(8 hours):1720 mg/m3(600 ppm)	
가 (LPG)	68476-85-7	OELs	TWA(8 hours):1800 mg/m3(1000 ppm)	
가 (LPG)	68476-85-7	ACGIH	:	
ISOBUTANE	75-28-5	ACGIH	STEL:1000 ppm	
Natural gas	75-28-5	ACGIH	:	
Calcium Carbonate		OELs	TWA (8) : 10 mg/m3	
ROSIN ESTER		ACGIH	:	Dermal/Respiratory Sensitizer, Cntrl all exposr-low as possib

ACGIH :
AIHA :
CMRG :
OELs :
TWA: 가
STEL:

CEIL:

8.2.

가 . , , 가 , , ,
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8.3 (PPE)

/ :
 / 가 . /
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가
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 : (Fluoroelastomer)

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가 가 . 가
 (Full Respiratory Protection Program)
 가 () 가
 가 가
 가 .

9.

9.1.

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 pH /
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 자료 없음.
 자료 없음.
 자료 없음.
 해당없음.
 <= -41.1 [테스트 방법:]
 해당없음.

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자료 없음.

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자료 없음.

해당없음.

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자료 없음.

자료 없음.

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해당없음.

-non-water

자료 없음.

-non-water

해당없음.

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해당없음.

자료 없음.

자료 없음.

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해당없음.

자료 없음.

22.7 - 24 %

10.

10.1

10.2

10.3 가

10.4

10.5

10.6

11.

가

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가 GHS

2 () GHS
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가 ,

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			; ATE >5,000 mg/kg
	- (4 hr)		; ATE >50 mg/l
			; ATE >5,000 mg/kg
2-METHYLPENTANE			LD50 5,000 mg/kg
2-METHYLPENTANE	-		LC50 50 mg/l
2-METHYLPENTANE			LD50 5,000 mg/kg
가 (LPG)	-가 (4)		LC50 227,000 ppm

#77

ISOBUTANE	-가 (4)	LC50 276,000 ppm
CYCLOPENTANE		LD50 5,000 mg/kg
CYCLOPENTANE	- (4)	LC50 > 25.3 mg/l
CYCLOPENTANE		LD50 > 5,000 mg/kg
CYCLOHEXANE		LD50 > 2,000 mg/kg
CYCLOHEXANE	- (4)	LC50 > 32.9 mg/l
CYCLOHEXANE		LD50 6,200 mg/kg
POLYMERIC TERPENE		LD50 5,000 mg/kg
POLYMERIC TERPENE		LD50 > 34,000 mg/kg
DIMETHYL ETHER	-가 (4)	LC50 164,000 ppm
BUTADIENE-STYRENE POLYMER		LD50 5,000 mg/kg
BUTADIENE-STYRENE POLYMER		LD50 2,000 - 5,000 mg/kg
METHYLCYCLOPENTANE		LD50 5,000 mg/kg
METHYLCYCLOPENTANE		LD50 > 5,000 mg/kg
ROSIN ESTER		LD50 > 2,000 mg/kg
ROSIN ESTER		LD50 > 2,000 mg/kg
N-HEXANE		LD50 > 2,000 mg/kg
N-HEXANE	- (4)	LC50 170 mg/l
N-HEXANE		LD50 > 28,700 mg/kg
Calcium Carbonate		LD50 > 2,000 mg/kg
Calcium Carbonate	- / (4)	LC50 3 mg/l
Calcium Carbonate		LD50 6,450 mg/kg

ATE=

		가
2-METHYLPENTANE	가	
가 (LPG)	가	
ISOBUTANE	가	
CYCLOPENTANE		
CYCLOHEXANE		
POLYMERIC TERPENE		가
DIMETHYL ETHER		가
BUTADIENE-STYRENE POLYMER	가	
METHYLCYCLOPENTANE		
ROSIN ESTER		
N-HEXANE		
Calcium Carbonate		

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		가
2-METHYLPENTANE	가	
가 (LPG)	가	
ISOBUTANE	가	
CYCLOPENTANE		
CYCLOHEXANE		
POLYMERIC TERPENE		가
DIMETHYL ETHER		가
BUTADIENE-STYRENE POLYMER		가
METHYLCYCLOPENTANE		
ROSIN ESTER		
N-HEXANE		
Calcium Carbonate		

		가
2-METHYLPENTANE		가
가 (LPG)		가
ISOBUTANE		가
CYCLOPENTANE		가
CYCLOHEXANE		가
POLYMERIC TERPENE		가
DIMETHYL ETHER		가
BUTADIENE-STYRENE POLYMER		가
METHYLCYCLOPENTANE		가
ROSIN ESTER		
N-HEXANE		
Calcium Carbonate		가

		가
2-METHYLPENTANE		가
가 (LPG)		가
ISOBUTANE		가
CYCLOPENTANE		가
CYCLOHEXANE		가
POLYMERIC TERPENE		가
DIMETHYL ETHER		가
BUTADIENE-STYRENE POLYMER		가
METHYLCYCLOPENTANE		가
ROSIN ESTER		가
N-HEXANE		가
Calcium Carbonate		가

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		가
2-METHYLPENTANE		가
가 (LPG)		가
ISOBUTANE		가
CYCLOPENTANE		가
CYCLOHEXANE		가
POLYMERIC TERPENE		가
DIMETHYL ETHER		가
BUTADIENE-STYRENE POLYMER		가
METHYLCYCLOPENTANE		가
ROSIN ESTER		가
N-HEXANE		가
Calcium Carbonate		가

		가
2-METHYLPENTANE		가
가 (LPG)	In Vitro	
ISOBUTANE	In Vitro	
CYCLOPENTANE		가
CYCLOHEXANE	In Vitro	
CYCLOHEXANE	In Vitro	
CYCLOHEXANE	In vivo	가 ,
POLYMERIC TERPENE		가
DIMETHYL ETHER	In Vitro	
DIMETHYL ETHER	In vivo	
BUTADIENE-STYRENE POLYMER		가
METHYLCYCLOPENTANE		가
ROSIN ESTER		가
N-HEXANE	In Vitro	
N-HEXANE	In vivo	
Calcium Carbonate		가

			가
2-METHYLPENTANE			가
가 (LPG)			가
ISOBUTANE			가
CYCLOPENTANE			가
CYCLOHEXANE			가
POLYMERIC TERPENE			가
DIMETHYL ETHER			
BUTADIENE-STYRENE POLYMER			가
METHYLCYCLOPENTANE			가
ROSIN ESTER			가
N-HEXANE			
N-HEXANE			가 ,
Calcium Carbonate			가

		가			
2-METHYLPENTANE		가			
가 (LPG)		가			
ISOBUTANE		가			
CYCLOPENTANE		가			
CYCLOHEXANE				NOAEL 24 mg/l	2
CYCLOHEXANE				NOAEL 24 mg/l	2
CYCLOHEXANE		가 / 가		NOEL 6.9 mg/l	
CYCLOHEXANE		가 ,		NOAEL 6.9 mg/l	2
POLYMERIC TERPENE		가			
DIMETHYL ETHER				NOAEL 40,000 ppm	
BUTADIENE-STYRENE POLYMER		가			
METHYLCYCLOPENTANE		가			
ROSIN ESTER		가			
N-HEXANE				NOAEL 2,200 mg/kg/day	
N-HEXANE		가 ,		NOAEL 0.7 mg/l	
N-HEXANE				NOAEL 1,140 mg/kg/day	90 days
N-HEXANE				LOAEL 3.52 mg/l	28 days
Calcium Carbonate				NOAEL N/A	
Calcium Carbonate				NOAEL 625 mg/kg/day	

			가
2-METHYLPENTANE			가
가 (LPG)			가
ISOBUTANE			가
CYCLOPENTANE			가
CYCLOHEXANE			가
POLYMERIC TERPENE			가
DIMETHYL ETHER			가
BUTADIENE-STYRENE POLYMER			가

METHYLCYCLOPENTANE			가
ROSIN ESTER			가
N-HEXANE			가
Calcium Carbonate			가

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			가			0
2-METHYLPENTANE				가	NOAEL	
2-METHYLPENTANE					NOAEL N/A	
2-METHYLPENTANE			가 ,			
2-METHYLPENTANE			가 ,		NOAEL	
2-METHYLPENTANE			가 ,		NOAEL	
2-METHYLPENTANE			가 ,		NOAEL N/A	
2-METHYLPENTANE				가	NOAEL	
가 (LPG)					NOAEL	
가 (LPG)					NOAEL	
가 (LPG)					NOAEL	
ISOBUTANE					NOAEL	
ISOBUTANE					NOAEL	
ISOBUTANE					NOAEL	
CYCLOPENTANE					NOAEL	
CYCLOPENTANE				가	NOAEL	
CYCLOHEXANE					NOAEL	
CYCLOHEXANE					LOAEL 0.09 mg/l	
CYCLOHEXANE			가 ,		NOAEL	
CYCLOHEXANE			가 ,			
CYCLOHEXANE				가	NOAEL	
POLYMERIC TERPENE			가			0

DIMETHYL ETHER					LOAEL 10,000 ppm	30
DIMETHYL ETHER			가 ,		NOAEL 100,000 ppm	5
BUTADIENE-STYRENE POLYMER			가 ,			
METHYLCYCLOPENTA NE					NOAEL	
METHYLCYCLOPENTA NE				가	NOAEL	
ROSIN ESTER			가			0
N-HEXANE					NOAEL	
N-HEXANE			가 ,		NOAEL	8
N-HEXANE			가 ,		NOAEL 24.6 mg/l	8
Calcium Carbonate			가 ,			
Calcium Carbonate					NOAEL 0.812 mg/l	90
Calcium Carbonate					NOAEL 0.0812 mg/l	

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			가			0
			가			
2-METHYLPENTANE					NOAEL 5.3 mg/l	14
2-METHYLPENTANE					NOAEL 1,500 ppm	
2-METHYLPENTANE			가 ,		NOAEL	8
2-METHYLPENTANE			가 ,		LOAEL 2,000 mg/kg	28 days
2-METHYLPENTANE			가 ,		NOAEL N/A	
2-METHYLPENTANE			가 ,		LOAEL 2,000 mg/kg	
가 (LPG)			가 ,		NOAEL	
ISOBUTANE			가 ,		NOAEL 4,500 ppm	13
CYCLOPENTANE			가			0
CYCLOHEXANE			가 ,		NOAEL 24 mg/l	90 days

CYCLOHEXANE			가 ,		NOAEL 1.7 mg/l	90 days
CYCLOHEXANE			가 ,		NOAEL 2.7 mg/l	10
CYCLOHEXANE			가 ,		NOAEL 24 mg/l	14
CYCLOHEXANE			가 ,		NOEL 6.9 mg/l	
CYCLOHEXANE			가 ,		NOEL 1.7 mg/l	
CYCLOHEXANE			가 ,		NOEL 1.5 mg/l	
CYCLOHEXANE					NOAEL 8.6 mg/l	30
CYCLOHEXANE					NOAEL 8.6 mg/l	
POLYMERIC TERPENE			가			0
DIMETHYL ETHER			가 ,		NOAEL 25,000 ppm	2 years
DIMETHYL ETHER			가 ,		NOAEL 20,000 ppm	30
BUTADIENE-STYRENE POLYMER			가			0
METHYLCYCLOPENTANE			가			0
ROSIN ESTER			가			0
N-HEXANE					NOAEL	
N-HEXANE			가 ,		LOAEL 1.76 mg/l	13
N-HEXANE			가 ,		NOAEL	6
N-HEXANE			가 ,		LOAEL 1.76 mg/l	6
N-HEXANE			가 ,		NOAEL 35.2 mg/l	13
N-HEXANE			가 ,		NOAEL	
N-HEXANE					NOAEL 1.76 mg/l	6
N-HEXANE			가 ,		NOAEL 1,140 mg/kg/day	90 days
N-HEXANE			가 ,		NOAEL	13

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Calcium Carbonate			가 ,		NOAEL	
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	가
2-METHYLPENTANE	
가 (LPG)	가
ISOBUTANE	가
CYCLOPENTANE	
CYCLOHEXANE	
POLYMERIC TERPENE	가
DIMETHYL ETHER	가
BUTADIENE-STYRENE POLYMER	가
METHYLCYCLOPENTANE	
ROSIN ESTER	가
N-HEXANE	
Calcium Carbonate	가

가 가 (MSDS)

12.

가 . 2 (,) 2 () GHS 가 . , , 가 GHS 가 , 가 2 () / .

12.1 : (GHS) : GHS

	N/A	가	N/A	N/A	N/A

	Cas #					
2-METHYLPENTANE	107-83-5	N/A	가	N/A	N/A	N/A
2-METHYLPENTANE	107-83-5			96	50%	15 mg/l

N-HEXANE	110-54-3			96	50%	2.5 mg/l
N-HEXANE	110-54-3			48	50%	>3.9 mg/l
N-HEXANE	110-54-3			48	50%	3.9 mg/l
CYCLOHEXANE	110-82-7			96	50%	4.53 mg/l
CYCLOHEXANE	110-82-7			72	50%	3.4 mg/l
CYCLOHEXANE	110-82-7			48	50%	0.9 mg/l
DIMETHYL ETHER	115-10-6	(.)		96	50%	>4,000 mg/l
DIMETHYL ETHER	115-10-6			48	50%	>4,000 mg/l
Calcium Carbonate				21 days		>100 mg/l
Calcium Carbonate				42 days		>100 mg/l
Calcium Carbonate		Western Mosquitofish		96	50%	>100 mg/l
BUTADIENE-STYRENE POLYMER		N/A	가	N/A	N/A	N/A
CYCLOPENTANE	287-92-3			48	50%	10.5 mg/l
POLYMERIC TERPENE		N/A	가	N/A	N/A	N/A
ROSIN ESTER		N/A	가	N/A	N/A	N/A
ROSIN ESTER				N/A	50%	>100 mg/l
ROSIN ESTER				N/A	50%	>100 mg/l
ROSIN ESTER				N/A	50%	>100 mg/l
가 (LPG)	68476-85-7	N/A	가	N/A	N/A	N/A
ISOBUTANE	75-28-5	N/A	가	N/A	N/A	N/A
METHYLCYC	96-37-7	N/A	가	N/A	N/A	N/A

LOPENTANE						
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12.2.

	CAS No.					
	None	가	N/A	N/A	N/A	N/A
2-METHYLPENTANE	107-83-5	Biodegradation	28 days		93 % weight	OECD 301C - MITI (I)
2-METHYLPENTANE	107-83-5	Photolysis	N/A	()	5.4 days (t 1/2)	
N-HEXANE	110-54-3	Bioconcentration	28 days		100 % weight	OECD 301C - MITI (I)
N-HEXANE	110-54-3	Photolysis	N/A	()	5.4 days (t 1/2)	
CYCLOHEXANE	110-82-7	Biodegradation	28 days		77 % weight	OECD 301F - Manometric Respiro
CYCLOHEXANE	110-82-7	Photolysis	N/A	()	4.14 days (t 1/2)	
DIMETHYL ETHER	115-10-6	Biodegradation	28 days		5 % weight	OECD 301D -
DIMETHYL ETHER	115-10-6	Photolysis	N/A	()	10.77 days (t 1/2)	
Calcium Carbonate		가	N/A	N/A	N/A	N/A
BUTADIENE-STYRENE POLYMER		가	N/A	N/A	N/A	N/A
CYCLOPENTANE	287-92-3	Biodegradation	28 days		0 % weight	OECD 301F - Manometric Respiro
CYCLOPENTANE	287-92-3	Photolysis	N/A	()	6.11 days (t 1/2)	
POLYMERIC TERPENE		Biodegradation	28 days		0 % weight	OECD 301C - MITI (I)
ROSIN ESTER		Biodegradation	28 days		47.3 % weight	OECD 301B - Mod. Sturm or CO2
ROSIN ESTER		Biodegradation	28 days		47.3 % weight	OECD 301B - Mod. Sturm or CO2
가	68476-85-7	가	N/A	N/A	N/A	N/A

(LPG)						
ISOBUTANE	75-28-5	Photolysis	N/A	()	13.7 days (t _{1/2})	
METHYLCYCLOPENTANE	96-37-7	Photolysis	N/A	()	5.33 days (t _{1/2})	

12.3. (가)

	CAS No.					
	None	가	N/A	N/A	N/A	N/A
2-METHYLPENTANE	107-83-5	Bioconcentration	N/A		64.8	
N-HEXANE	110-54-3	Bioconcentration	N/A		50	Est:
N-HEXANE	110-54-3	Bioconcentration	N/A		138	
CYCLOHEXANE	110-82-7	BCF-Carp	56 days		<129	
DIMETHYL ETHER	115-10-6	가	N/A	N/A	N/A	N/A
DIMETHYL ETHER	115-10-6	Bioconcentration	N/A	/	0.2	
Calcium Carbonate		가	N/A	N/A	N/A	N/A
BUTADIENE-STYRENE POLYMER		가	N/A	N/A	N/A	N/A
CYCLOPENTANE	287-92-3	Bioconcentration	N/A	/	3.00	
POLYMERIC TERPENE		가	N/A	N/A	N/A	N/A

POLYMERIC TERPENE		BCF- Carp	70 days		11100	
ROSIN ESTER		Bioconcentration	N/A		7.4	Est:
ROSIN ESTER		Bioaccumulation	N/A	/	5.8	
가 (LPG)	68476-85-7	가	N/A	N/A	N/A	N/A
ISOBUTANE	75-28-5	BCF - Other	N/A		1.97	
ISOBUTANE	75-28-5	Bioconcentration	N/A	/	2.76	
METHYLCYCLOPENTANE	96-37-7	Bioconcentration	N/A		130	Est:

12.4.

12.5.

	CAS No.	가	가
		가	가
2-METHYLPENTANE	107-83-5	가	가
N-HEXANE	110-54-3	가	가
CYCLOHEXANE	110-82-7	가	가
DIMETHYL ETHER	115-10-6	가	가
Calcium Carbonate		가	가
BUTADIENE-STYRENE POLYMER		가	가
CYCLOPENTANE	287-92-3	가	가
POLYMERIC TERPENE		가	가
ROSIN ESTER		가	가
가 (LPG)	68476-85-7	가	가

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ISOBUTANE	75-28-5	가	가
METHYLCYCLOPENTANE	96-37-7	가	가

13.

13.1. _____ / _____.

13. 2. 가 . ,

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14.

UN : UN1950
UN :

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15.

15.1. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{6}$ /

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CYCLOHEXANE	1.00		Korea. Controlled Hazardous Substances (Industrial Safety and Health Regulations, Table 7)
N-HEXANE	1.00		Korea. Controlled Hazardous Substances (Industrial Safety and Health Regulations, Table 7)
1,3-DIETHENYLBENZENE POLYMER WITH 0.00 1,3-BUTADIENE AND ETHENYLBENZENE			Korea. Non-Toxic Chemicals (Ministerial Ordinance on TCCL Article 9; NIER Notice No. 1997-10)
가 (LPG)	0.00		.
N-HEXANE	0.00		.

16.

16.1.

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16.2. :2014/07/01

16.3. :

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:2016/11/07

16.4. :

: (MSDS) 가

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(MSDS) www.3m.com/kr 가 .