

<PPG>

HDPC

“ ”

가

3 가

Dow Dow (HDPC)
PU

HDPC , Dow가 MDI

PU
Dow 15 (50:50) 23 (Dow 6) 1

HDPC가

60% PU

92 PPG 6 2000 6 4000
65%, 24% 5%
20%

가 PU

HDPC 93 2 5 MDI

MDI
HDPC 93 5 가

, 6

HDPC 2 5500 DMKL(Dow Mitsubish Kasei LTD) , Dow
Korea가

PPG		(: M/T, %)							
	1992		1993		1994		1995		(91~96)
가	46,426	70.1	52,000	12.0	58,310	12.1	65,540	12.4	12.3
	10,928	16.5	12,890	18.0	15,800	22.6	18,450	16.8	15.0
	13,444	20.3	14,290	6.3	15,260	6.8	16,340	7.1	6.7
	22,054	33.3	24,820	12.5	27,250	9.8	30,750	12.8	12.0
	13,451	18.8	15,040	11.8	16,750	11.4	18,780	12.1	11.8
	7,683	11.6	8,670	12.8	9,750	12.5	10,900	11.8	12.6
	4,768	7.2	6,370	10.4	7,000	9.9	7,880	12.6	10.5
R I M	1,500	5.8	1,700	13.3	1,979	15.9	2,230	13.2	15.0
E l a s t o m e r	3,510	5.3	5,490	13.2	6,070	10.6	6,780	11.7	11.5
	3,046	4.6	3,340	9.7	3,900	17.4	4,250	8.4	7.7
	464	0.7	2,150	19.1	2,150	-	2,530	17.6	7.5
	66,228	100.0	74,230	12.1	83,100	11.9	93,330	12.3	12.0
P O E	52,000	-	66,300	12.4	74,500	11.8	83,700	12.3	12.0

가 ,

HDPC CFC , I · S · F , HCFC ,

75 11 , 1

5000 , 7 5000

75 11

75 88

PU 88 10 Dow 2 5000 , 가 91 12 Arco 10 PO 2

PPG 92 3

92 Arco , HDPC PPG PU 93 1 Dow

PPG (: M/T)								
	POLYOL			ISOCYANATE				
	PPG	PET	PTMEG	TDI	PMDI	MMDI	Prepolymer	
FLEXIBLE FOAM	41,500	-	-	19,100	1,000	-	900	62,500
Slab stock foam	26,000	-	-	15,000	-	-	-	41,000
Mold foam	11,600	-	-	4,000	1,000	-	800	17,400
가	400	-	-	100	-	-	100	600
	3,500	-	-	-	-	-	-	3,500
SEMI-RIGID FOAM	2,900	-	-	-	1,500	-	500	4,900
EA foam	900	-	-	-	-	-	500	1,400
	2,000	-	-	-	1,500	-	-	3,500
INTEGRAL SKINFOAM	2,400	11,200	-	-	-	5,000	1,600	20,200
가	800	-	-	-	-	-	350	1,150
	100	-	-	-	-	-	50	150
Shoe sole	-	11,200	-	-	-	5,000	400	16,600
R I M	1,500	-	-	-	-	-	800	2,300
RIGID FOAM	14,000	-	-	-	20,000	-	-	34,000
	7,000	-	-	-	10,000	-	-	17,000
	1,750	-	-	-	2,500	-	-	4,250
	1,750	-	-	-	2,500	-	-	4,250
	1,400	-	-	-	2,000	-	-	3,400
	2,100	-	-	-	3,000	-	-	5,100
	4,000	16,800	8,500	5,600	3,500	6,000	-	44,400
	-	16,000	500	3,600	-	3,400	-	23,500
	-	-	8,000	-	-	2,000	-	10,000
T P U	-	800	-	-	-	200	-	1,000
	400	-	-	2,000	3,500	400	-	9,900
	64,800	28,000	8,500	24,700	26,000	11,000	3,000	166,000

HDPC ,

92 PPG

6 7100

4 6300 65%

1 780 21%,

5 4 2 0

8%, 4280 6% , 3 PPG 10%
 , 92 8 , 2 93 9 2000 2
 4000

65% , Formulation System
 , Dow Dow

Arco
 PPG PO(Propylene Oxide) , PO
 PPG ,
 Dow Dow PO
 PO가 10 PO , 가
 PO(Propylene Oxide) 17 5000 , PO

Arco
 10 96 1500 17
 5000

PPG (: M/T)				
	1990	1991	1992	1993
	37,600	40,500	43,600	46,000
H D P C	13,900	14,710	13,800	14,500
	-	1,290	5,400	8,000
	51,500	56,500	62,820	68,500
	4,871	5,938	4,280	6,000
	56,371	62,438	67,100	74,500

PPG (: M/T, %)				
	Polyether		Polyester	
		M/S		M/S
Non-Foam Shoe-Sole	37,647	63.7	398	1.4
	11,584	19.6	-	-
	5,969	10.1	-	-
	3,900	6.6	2,045	7.2
	-	-	9,912	34.9
	-	-	8,605	30.3
	-	-	3,862	13.6
	-	-	3,578	12.0
	59,100	100.0	28,400	100.0

Badger Engineering
 PO . 가 .
 가가 . 92 PO 7 10%
 15%
 4849 8.2% , Non-Foam 5322 9.0%
 , 118 0.2%, 769 1.3%
 PPG
 Bumper · Integral Skin Foam ·
 Seat-Back Hot Cure TDI PU가 가 , Cushiond Cold Cure
 TDI/MDI Mix PU가 , All MDI PU가
 , Seat-Back TDI PU ,
 Cushion · All MDI PU , Head rest ISF · Cold Cure PU
 Arm rest · Steering Wheel · Core PU PVC , Sun-Visor
 Instrument Panel-Inside PU

Seat-back Hot Cure PU , Royal
Head rest · Arm rest · Bummper Fascia ISF RIM PU
PU Seat back · Cusion PU
Instrument Panel-Cover Inside PU Finisher Air
Spoiler RIM PU
PPG 가()
가 15% 가
4 6426 23.5%
가 PPG 가 91~96
15.0%, 12.0% 가가 PPG 12.3%
PPG 가
58.3%
가 10% 가 , 93
110% 가 7%, 6%
PPG 18%
91 5735 15% 가 1080 22%,
1484 55%, 1088 399%, 2231 48% 1 1613 90
36% 가
PPG 30.3% , 89~91
43.9% , 91~96 12.6%, 10.5%
11.8%
가
, RIM 92 1500 Bumper 가
, 91~96 가 15.0%
, Stmctual
Reinforce RIM

PPG		(: M/T, %)							
		1993	1994	1995	1996	1997	1998	1999	2000
SLAB	T T L	26,000	28,000	29,000	30,000	31,100	32,100	33,200	34,400
	Specialty		22,400 5,600	23,200 5,800	24,000 6,000	24,800 6,300	25,600 6,500	26,500 6,700	27,500 6,900
MOLD	T T L	18,000	20,200	22,000	24,000	26,300	28,600	31,000	33,700
	Hot/Cold S - R		14,100 6,100	15,400 6,600	16,800 7,200	18,400 7,900	20,000 8,600	21,700 9,300	23,600 10,100
RIGID	T T L	21,000	20,900	22,300	23,900	25,600	27,300	29,100	31,200
	R E F		7,000 13,900	7,200 15,100	7,500 16,400	7,800 17,800	8,100 17,200	8,400 20,700	8,800 22,400
CASE	T T L	7,000	7,200	7,700	8,200	8,800	9,400	10,000	10,700
		6,800	6,000	6,000	6,000	6,000	6,000	6,000	6,000
		72,000	76,300	81,000	86,100	91,800	97,400	103,300	110,000

PPG TDI-100, 65 MDI
가
, TPU TPU OA

가

PPG

91 5 9132 3 6895 62.4%, 1 4192 , 24.9%,
2107 3.6%, 5938 10.0%
1 8640 64.6%, 5771 , 20.0%,
2107 7.3%

1 3671 76.3%
가

가

가 PU Takeda Chemical PU

70

가 Takeda DM KASEI MDI SANYO

KASEI PU

MDI

PU

MDI

Non- Triol Diol , Triol 3000
Diol , Triol

91

가

Dow가 MDI

PU

PPG		(: M/T, %)						
		1990			1991			(90~92)
Flexib -le Slab Stock	HR) (HLB0) (FL)	19,806	82.7	38.3	21,580	83.0	32.6	4.5
		1,964	8.2	3.8	2,340	9.0	3.5	9.5
		1,293	5.4	2.5	1,300	5.0	2.0	0.3
		886	3.7	1.7	780	3.0	1.2	0.6
		23,949	100.0	46.3	26,000	100.0	39.3	4.3
Flexib -le Model	Hot Cure	5,017	39.7	9.7	8,650	39.0	13.1	36.3
	Cold Cure	4,190	33.2	8.1	8,250	37.1	12.5	48.6
		3,414	27.1	6.6	5,300	23.9	8.0	27.6
		12,621	100.0	24.4	22,200	100.0	33.6	37.9
Rigid		6,259	58.3	12.1	7,000	50.0	10.6	26.9
		1,138	10.4	2.2	1,750	12.5	2.6	38.2
		1,190	11.2	2.3	2,100	15.0	3.2	220.3
		259	2.5	0.5	1,400	10.	2.1	3.0
		1,862	17.6	3.6	1,750	12.5	2.6	15.4
		10,708	100.0	20.7	14,000	100.0	21.1	3.0
(CASE)		4,448	-	8.6	4,000	-	6.0	15.4
		51,726	-	100.0	66,200	-	100.0	5.0

PPG		(: M/T)
가		
.	BASF	230,000
	Union Carbide	200,000
	Dow Chem	180,000
	Arco Chem	150,000
	Carpentor	100,000
	Olin	100,000
	Mobay	100,000
	Huels	85,000
	Bayer	80,000
	MTC	67,200
	Asahi-Olin	60,000
	Sanyo Kasei	45,000
	Dow Japan	40,000
	Asahi Denka	30,000
	Taketa	28,000
	Daiichi Kyogyo	18,000
	DIC	14,400
	SBU	14,000
	Dob Chiba	13,000
		50,000
		20,000
		20,000

HDPC가 2 5000 MDI 가 PU
가 .

PPG (1993) (: M/T, %)		
		M/S
Non - Foam	25,900	35
	19,980	27
	14,800	20
	13,320	18
	74,000	100

가 , PO
PO
91 ~ 92
Dow가 MDI
MDI
SM PO

Arco가 , MDI 가 .

PPG (: M/T, %)									
		1988		1989		1990		1991	
			M/S		M/S		M/S		M/S
		20,100	67.0	19,020	70.0	18,577	66.4	18,640	64.6
		-	-	-	-	-	-	5,771	20.0
		-	-	-	-	-	-	2,107	3.7
		30,000	65.4	27,172	62.4	27,948	54.1	28,856	48.8
		7,844	90.0	6,932	80.0	9,299	72.2	13,671	76.3
		872	10.0	1,733	20.0	3,581	27.8	4,246	23.7
		8,716	19.0	8,665	19.9	12,880	24.9	17,917	30.3
		3,879	95.0	2,696	72.0	3,153	66.3	3,100	64.0
		204	5.0	1,049	28.0	1,606	33.7	1,749	36.0
		4,083	8.9	3,745	8.6	4,759	9.2	4,849	8.2
RIM BUMPER		0	0	294	45.0	627	67.3	854	65.6
		0	0	359	55.0	304	32.7	447	34.4
		963	2.1	653	1.5	931	1.8	1,301	2.2
Non-Foam		2,068	98.0	3,243	98.0	3,439	66.5	4,018	64.7
		42	2.0	66	2.0	1,733	33.5	2,191	35.3
		2,110	4.6	3,309	7.6	5,172	10.0	6,209	10.5
		-	-	3,483	8.0	4,871	9.4	5,938	10.0
		45,872	100.0	43,545	100.0	51,726	100.0	59,132	100.0

PPG , PU