



현대캠텍(주)는 끊임없는 연구개발, 엄격한 품질관리와 함께 세계적 수준의 두라톤 분체도료를 제조판매하고 있습니다. Hyundai Chemtech Co., Ltd has been producing DURATON powder coatings based on the worldwide technology with continuous R&D and strict quality control.

두라톤 분체도료는 용제를 사용하지 않는 100% 고형분의 분말도료로서 휘발성 유기화합물질 발생, 폐수처리문제 등의 공해문제를 해결한 환경친화적 도료입니다. DURATON is solvent free coatings of 100% solid content and an environmental-friendly powder coatings that can overcome the pollution problems by VOCs and waste water.

또한 1회 도장만으로 액체도료에 비해 월등한 내구성 및 경제성을 얻을 수 있으며, 가전제품, 금속가구, 공업용 부품류, 고내후성 건축자재, 수도관, 송유관, 가스관 등의 파이프, 철근 및 전기절연용에도 적용됩니다. DURATON also provides the excellent durability and economical efficiency through one coat application when compared with liquid coating systems. DURATON can be used for the wide range of applications such as home appliance, steel furniture, industrial appliance, durable architectural materials, reinforced bar, electric insulator and pipes for water, gas, oil etc.

두라톤 사용안내 (DURATON User Guide)

- 현대캠텍(주)에서 생산되는 두라톤 제품은 국내외 환경규제물질(수은, 납, 카드뮴, 6가크롬, PBB, PBDE, TGIC)을 포함한 원료를 사용하지 않습니다. DURATON products from Hyundai Chemtech do not use raw material that includes environment regulated substance(mercury, lead, cadmium, hexavalent chrome, PBB, PBDE, TGIC) in both domestic and overseas.
- 제품 적용시 Data Sheet 및 제품사양서를 확인한 후 적용 바라며 의문사항은 회사로 문의하시기 바랍니다. Before applying, make sure to verify data sheet, as well as product description. Also, please contact corporation for further questions.
- Durable metallic을 제외한 Silver, Copper, Gold 등 Metallic 성분을 함유한 색상들은 습기 및 내화학성에 민감하므로 반드시 투명도장을 필요로 합니다. Excepting durable metallic, make sure to use a method of transparent coating for colors that include metallic components such as, silver, copper, gold, etc., because they are highly sensitive about humidity, as well as chemical resistance.
- 메탈릭, 펄, 특수무늬 도료는 도막두께, 도장건의 종류, 도료 토출량, 건조로 조건, 피도물의 전처리 조건, 도장시 회수분체 혼합비율에 따라 색상 및 무늬 등의 외관에 달라질 수 있으므로 동일 도장 조건을 유지하여 주시기 바랍니다. Special pattern, metallic, and pearl powder coatings may be changed in terms of color, as well as pattern, in accordance to coating thickness, category of spray guns, powder discharge, cure conditions, pretreatment condition of substrate, and reclaimed powder mixing ratio.
- 본 표준색상은 실제 색상과 제작과정에서 약간의 차이가 있을 수 있으므로 사전 확인 후 사용하시기 바랍니다. These standard color examples that are registered in the catalog may be slightly different from the actual colors in the production process. Therefore, please make sure to pre-check the colors before using.
- 본 색상북에 등재되지 않은 국내외에 사용중인 표준색상(예 : 한국페인트 공업협동조합, MUNSELL, RAL, FS, NCS, PANTONE COLOR)도 두라톤 으로 공급가능합니다. DURATON also provides standard colors(such as MUNSELL, RAL, FS, NC, PANTONE COLOR) that are being used in both domestic and overseas, but are not listed in the catalog.

DURATON CODE SYSTEM

HS82-WH241

① ② ③ ④ ⑤ ⑥

① 수지구분	Resin type	H	▶ 하이브리드 Hybrid
② 외관	Appearance	S	▶ 일반 Smooth
③ 경화온도	Curing temperature	8	▶ 180℃
④ 광택	Gloss	2	▶ 20~29 Gloss
⑤ 색상	Color	WH	▶ 백색 White color
⑥ 일련번호	Serial number	241	

1. 수지구분 (Resin Type)

제품명 (Product Typical Name)	축어 (Abbreciation)	수지구분 (Resin Type)	특징 (Character)
DURATON EP 1000	E	Epoxy	내화학성, 절연성 Chemical resistance, Insulation
DURATON HB 2000	H	Hybrid(Epoxy-Polyester)	범용, 내부용 General use, Indoor field
DURATON PF 3500	F	Polyester β-H.A.A	옥외용, TGIC Free Outdoor field
DURATON PU 4000	U	Polyurethane	고경도, 옥외용 High pencil hardness, Outdoor field
DURATON AR 5000	A	Acrylic polyester / Epoxy	내후성, 투명 Weather reistance, Clear
DURATON UV 6000	V	UV(Ultra violet)	자외선경화, 저온경화, 목재용 UV cure, Low cure, MDF use
DURATON SI 7000	S	Silicone polyester / Epoxy	고내열성 Heat resistance

2. 외관 (Appearance)

축어 (Abbreciation)	특징 (Character)
A 알루미늄	Aluminium effect
B 황동	Bronze effect
C 동분	Copper effect
G 금분	Gold effect
H 함마톤 유색	Colored hammer effect
I 함마톤 메탈릭	Metallic hammer effect
J 함마톤 펄	Pearl hammer effect
L 함마톤 멀티	Multi-colored hammer effect
K 크랙	Crack effect
M 다채색	Multi-colored effect
N 다채색 메탈릭	Multi-colored metallic effect
P 펄	Pearl effect
S 일반	Smooth
T 텍스처	Texture effect
V 샌드텍스처	Sandtexture effect
X 샌드텍스처 메탈릭	Sandtexture metallic effect
W 링클	Wrinkle effect
Y 착색투명	Tinted effect
Z 투명	Clear
# 기타	Others

3. 경화온도 (Curing Temperature)

축어 (Abbreciation)	온도 (Metal Temperature)
1	Radiation Cure
2	120℃
3	130℃
4	140℃
5	150℃
6	160℃
7	170℃
8	180℃
9	190℃
0	200℃
A	210℃
B	220℃
C	230℃
D	240℃
E	250℃

4. 광택(60°) (Gloss)

축어 (Abbreciation)	광택범위 (Gloss Range)
0	0~9
1	10~19
2	20~29
3	30~39
4	40~49
5	50~59
6	60~69
7	70~79
8	80~89
9	90~

5. 색상 (Color)

축어 (Abbreciation)	색상 (Color)
BE 베이지	Beige
BK 흑색	Black
BL 청색	Blue
BR 갈색	Brown
CL 투명	Clear
GN 녹색	Green
GY 회색	Grey
IV 상아색	Ivory
MN 밤색	Maroon
OE 오렌지색	Orange
PK 분홍	Pink
RD 적색	Red
VT 보라색	Violet
WH 백색	White
YG 연두	Yellow-green
YW 황색	Yellow
PS 은펄색	Pearl silver
MS 은색	Metallic silver
MG 금색	Metallic gold
MC 동색	Metallic copper
PR 적색펄	Pearl red

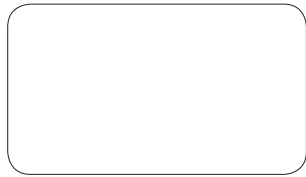
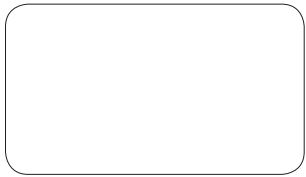
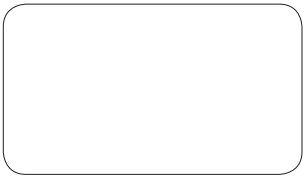
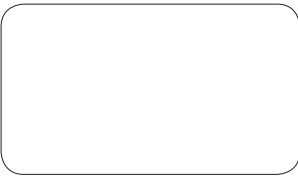
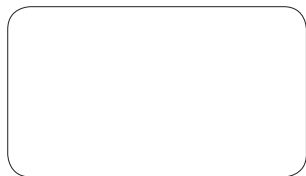
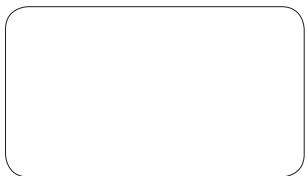
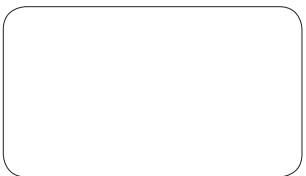
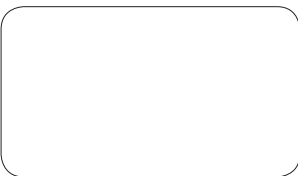


DURATON PATTERN TYPES

구분 (Type)	제품군 (Product name)	수지타입 (Resin type)					도료특성 (Character)	용도 (Purpose)
		EP	HB	PE	PU	AR		
일반도료 (Smooth)	EP 1000 Series	○					내화학성, 내식성 우수 Excellent chemical and corrosion resistance	내부용, 산업용, 건축용 Indoor, Industrial and architectural field
	HB 2000 Series		○				내식성, 기계적 물성 우수 Anticorrosion, Mechanical property	내부용, 산업용, 건축용 Indoor, Industrial and architectural field
	PF 3500 Series			○			내후성 우수, 무독성 Durable, Toxic free	외부용, 산업용, 건축용 Outdoor, Industrial and architectural field
	PU 4000 Series				○		내후성, 내화학성 우수 Excellent durability and chemical resistance	외부용, 산업용, 건축용 Outdoor, Industrial and architectural field
	AR 5000 Series					○	내후성, 경도 우수 Excellent durability and hardness	외부용, 산업용, 건축용 Outdoor, Industrial and architectural field
무늬도료 (Pattern effect)	텍스처 Texture	■	■	■	■	■	가죽무늬 질감 Leader feel effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	샌드텍스처 Sandtexture	■	■	■	■	■	모래 질감내 Sand feel effect	외부용, 산업용, 건축용 Outdoor, Industrial and architectural field
	메탈릭 샌드텍스처 Metal texture	■	■	■	■		메탈릭과 모래 질감 Metallic sand feel effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	함마톤 Hammer effect	■	■	■	■		망치로 때린 질감 Hammer and vein effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	크랙톡 Crack effect	■	■	■	■		표면 갈라짐 질감 Surface cracked feel	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	멀티톤 Multi effect	■	■	■	■		다채색 외관 Multi colored effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	착색투명 Tinted clear	■	■	■	■		반투명, 뛰어난 선명성 Semi-clear, Excellent clearness	내외부용, 건축용 Indoor/outdoor and architectural field
	스파클 메탈릭 Sparkle metallic	■	■	■	■		선명한 메탈릭 효과 Sparkle metallic effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	메탈릭 Metallic	■	■	■	■		금속질감 Metallic effect	내외부용, 산업용, 건축용 Indoor/outdoor, Industrial and architectural field
	크롬실버 Chrome silver	■	■				도금질감 Chrome metallic effect	내부용, 건축용 Indoor and architectural field
	링클톤 Wrinkle effect		■	■			주름무늬 및 악어가죽 질감 Wrinkle and alligator skin effect	내외부용, 건축용 Indoor/outdoor and architectural field
	필도로 Mica effect		■	■	■		필외관 Mica appearance effect	내외부용, 건축용 Indoor/outdoor and architectural field
	스웨이드톤 Suade effect		■				부드러운 질감 Soft feel	내부용, 산업용 Indoor and Industrial field
	갤럭시 Galaxy effect		■				우주 별효과 Galaxy effect	내부용 Indoor field
	항균 분체 Anti-fungi & bacterial powder coating		○				항균성 99.99% Antifungi and bacterial activity, 99.99%	내부용 Indoor field
특수기능성 도료 (Special perfor-mance)	기포방지용 분체 Degassing powder coating		○	○	○		기포방지 기능, 주물류에 적용 Degassing and out gassing of substrate	내외부용, 산업용 Indoor/outdoor and architectural field
	대전방지용 분체 Antistatic powder coating	○	○	○	○		대전방지 기능 Antistatic function	크린룸, 반도체장비 Cleanroom, Semiconductor equipment
	부스바용 분체 Bus bar powder coating		○				절연성, 난연성, 부착성 우수 Excellent insulation, Flame retardation, Adhesion	부스바, 부스닥트 Bus bar and duct
	저항기용 분체 Capacitor powder coating	○					절연성, 난연성, 레이저 마킹 우수 Excellent insulation, Flame retardation, Laser marking	콘덴샤 Condenser
	모타용 분체 Stator powder coating		○				절연성, 난연성, 부착성 우수 Excellent insulation, Flame retardation, Adhesion	모타 Stator slot
	내후성 분체 Durable powder coating			○	○		고내후성, 초내후성 AAMA기준적합 Durable and super durable Meet AAMA specification	외장용, 건축용 Outdoor and architectural field
	고내후성 메탈릭 Durable metallic powder coating				○		고내후성 메탈릭 분체 Durable metallic	외장용, 건축용 Outdoor and architectural field
	이지클린 분체 Easy cleaning powder coating		○	○	○		낙서 및 오염방지 분체 Easy clean & antigraffiti effect	스크린도어, 전동차판넬 Screen door, Subway train panel

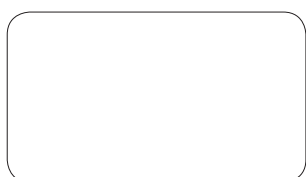
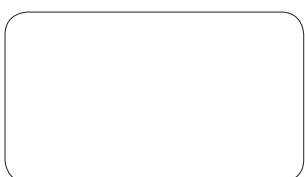
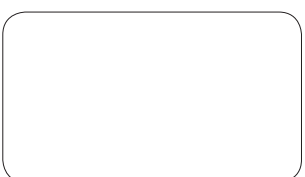
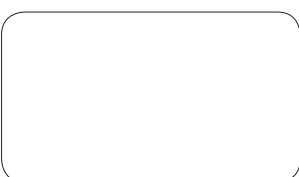
내부용 유광

HYBRID
Gloss

			
20-001 HS89-WH279 WHITE(E7) (PT)	20-002 HS89-WH188 WHITE(009)	20-003 HS89-WH280 EC0853 (IP)	20-004 HS89-WH281 EC0263 (IP)
			
20-005 HS89-WH282 WH0011 (KC)	20-006 HS89-WH194 중앙 백색	20-007 HS89-WH192 SB 백색	20-008 HS89-WH283 WH0009 (KC)
			
20-009 HS89-WH284 N9.5 (KC)	20-010 HS89-WH285 WH0064 (KC)	20-011 HS89-WH286 PURE WHITE (PT)	20-012 HS89-WH287 EC0983 (IP)
			
20-013 HS89-WH288 JA백색 (PM)	20-014 HS89-WH289 N/WHITE(WH0220) (KC)	20-015 HS89-WH193 AS RAL 9002	20-016 HS89-WH290 RAL9010 (KC)
			
20-017 HS89-WH291 EU0183 (IP)	20-018 HS89-WH292 R/WHITE (PT)	20-019 HS89-BE198 PALE BEIGE (KC)	20-020 HS89-IV306 IVORY (KC)
			
20-021 HS89-IV307 N9.0(K1A) (KC)	20-022 HS89-IV308 IV0014 (KC)	20-023 HS89-WH293 PA-8935 (KC)	20-024 HS89-WH294 BLUEWHITE (KC)
			
20-025 HS89-IV309 D34880 (KC)	20-026 HS89-IV214 E-34890	20-027 HS89-IV310 5Y8.5/1 (KC)	20-028 HS89-IV311 2.5Y9/1 (KC)

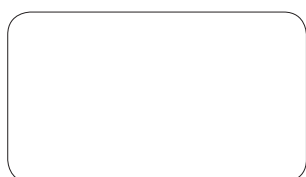
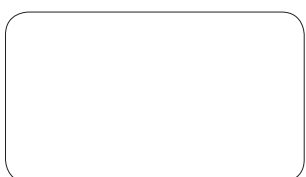
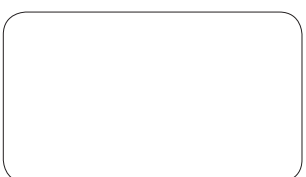
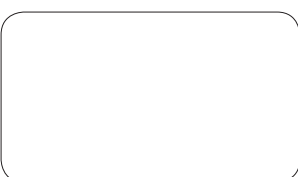
본 색상표는 실제도료의 색상과 작업공정상 약간의 차이가 있을 수 있습니다.

1

			
20-029 HS89-IV220 C-30891	20-030 HS89-IV312 IVORY(SW) (PL)	20-031 HS89-IV313 D32871 (KC)	20-032 HS89-IV314 C30891 (KC)
			
20-033 HS89-IV315 D30871 (KC)	20-034 HS89-IV221 CH RAL 1015	20-035 HS89-BE199 FAMILY ALMOND(O) (KC)	20-036 HS89-WH200 SM 남부 백색
			
20-037 HS89-BE220 D80770 (KC)	20-038 HS89-GY339 N8.0 (KC)	20-039 HS89-GY227 A/N8.0	20-040 HS89-GY340 RAL 7035 (KC)
			
20-041 HS89-GY229 한일 LIGHT GRAY	20-042 HS89-GY341 N7.0 (KC)	20-043 HS89-GY342 C80680 (KC)	20-044 HS89-GY343 N5.5 (PT)
			
20-045 HS89-GY344 ED0103 (IP)	20-046 HS89-GY345 7.5BG 6/1.5 (KC)	20-047 HS89-GY346 N4.0 (KC)	20-048 HS89-GY347 S/SEPIA(DW) (KC)
			
20-049 HS89-BR170 BROWN (KC)	20-050 HS89-BK135 NEWBLACK(UP) (PT)	20-051 HS89-BK136 BLACK(N) (KC)	20-052 HS89-BK106 흑색 유광
			
20-053 HS89-YW114 PA3758 (S)	20-054 HS89-YW121 YELLOW(K) (KC)	20-055 HS89-YW122 L.T.YELLOW (KC)	20-056 HS89-OE118 SAKIYA OE (PT)
			
20-057 HS89-OE119 S/ORANGE (KC)	20-058 HS89-OE112 영진 S/ORANGE	20-059 HS89-RD133 RD0001 (KC)	20-060 HS89-RD123 적색 SK

These color samples are close as possible to actual offered.

2

			
20-061 HS89-BL211 L/BLUE(BU) (KC)	20-062 HS89-BL106 D54506	20-063 HS89-BL212 4PB 4/10(HDPM) (KC)	20-064 HS89-BL213 BLUE(K) (KC)
			
20-065 HS89-BL168 HJ BLUE	20-066 HS89-BL173 영진 E-56356 유광	20-067 HS89-BL214 BLUE(KW) (KC)	20-068 HS89-BL215 EJ027K (IP)
			
20-069 HS89-BL216 NEW BLUE(NS) (KC)	20-070 HS89-GN198 2.5G 6/3 (KC)	20-071 HS89-GN197 E39684 (KC)	20-072 HS89-GN156 DS 연녹색
내부용 반/무광			
HYBRID Semi-gloss & Matt			
			
20-073 HS83-WH202 A/N9.5	20-074 HS83-WH295 HANMI WHITE (PT)	20-075 HS83-WH296 N9.5 (KC)	20-076 HS83-WH297 D80940 (KC)
			
20-077 HS83-WH298 PWWHITE (PT)	20-078 HS81-WH299 D80940 (KC)	20-079 HS87-WH300 N9.5 G-60 #HSG (PL)	20-080 HS83-WH301 RAL9010 (KC)
			
20-081 HS84-WH302 S/WHITE(DS) (KC)	20-082 HS82-WH147 IK WHITE	20-083 HS83-IV316 N9.0 (KC)	20-084 HS83-GY234 DY N9.0
			
20-085 HS83-IV317 WHITE(EK) (KC)	20-086 HS82-IV318 C-7A05-2D (PT)	20-087 HS81-IV302 IV0374 (K)	20-088 HS83-IV320 503 IVORY #SWC (PL)

본 색상표는 실제도료의 색상과 작업공정상 약간의 차이가 있을 수 있습니다.

3

			
20-089 HS83-GY348 N8.5 (PT)	20-090 HS83-IV223 V/DB IVORY(004)	20-091 HS83-IV321 2.5Y9/1 (KC)	20-092 HS83-IV322 C30891 (KC)
			
20-093 HS83-IV323 2.5Y9/2 (KC)	20-094 HS83-IV324 32871 (KC)	20-095 HS83-BE201 PALE BEIGE (KC)	20-096 HS82-BE202 3873-IH #DS (PL)
			
20-097 HS83-BE203 D80830 (KC)	20-098 HS83-BE204 2.5Y8/2 (KC)	20-099 HS83-BE205 DIC 546 1/2 E (PT)	20-100 HS83-BE206 RAL9002 (KC)
			
20-101 HS82-BE207 DB-C304 (PT)	20-102 HS83-BE208 D34770 (KC)	20-103 HS83-BE209 ED127K (IP)	20-104 HS82-BE210 ED125K (IP)
			
20-105 HS82-BE211 STD-5Y7/1 (KC)	20-106 HS83-BE212 RAL 7032 (KC)	20-107 HS83-BE213 5Y7/1 (KC)	20-108 HS85-BR171 L/BROWN #HK (PL)
			
20-109 HS87-BR172 BROWN(OD) (PL)	20-110 HS81-BR173 IEM120K (PT)	20-111 HS82-GY349 7.5BG6/1.5 (KC)	20-112 HS84-GY240 C-55771
			
20-113 HS81-GY350 W3000-2, WD2 (PT)	20-114 HS82-GY351 RAL7035(KC)	20-115 HS81-GY352 GREY(OD) (PL)	20-116 HS84-GY241 N8.0
			
20-117 HS83-GY353 N8.0 (KC)	20-118 HS84-GY354 N7.5 (KC)	20-119 HS82-GY242 N6.5	20-120 HS83-GY355 N7.0 (KC)

These color samples are close as possible to actual offered.

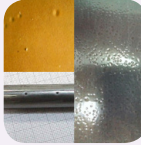
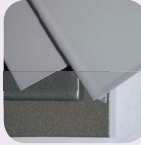
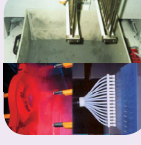
4

DURATON FUNCTIONAL TYPES

구분 (Type)	제품명 (Product name)	수지타입 (Resin type)					도료특성 (Character)	용도 (Purpose)
		EP	HB	PE	PU	AR		
특수기능성 도료 (Special perfor-mance)	속경화 분체 Fast curable powder coating		○				빠른 경화시간 Fast cure schedule	내장용, 산업용, 건축용 Indoor, Industrial and architectural field
	난연 분체 Flame retardation powder coating		○	○			난연효과, UL94 V-0만족 Flame retardation effect, Meet UL94 V-0 specification	산업용, 건축용 Industrial and architectural field
	열전사용 분체 Film transcription powder coating		○	○	○		열전사 필름무늬 효과 Dye sublimation effect	건축용, 알루미늄 차시 Architectural, Aluminum chassis
	고내식성 프라이머 분체 Corrosion resistance primer powder	○					징크리치 프라이머 Zinc rich primer	내장용, 산업용, 건축용 Indoor, Industrial and architectural field
	용융도금용 분체 Hot dip galvanized plating		○	○			부착성 우수 Excellent adhesion	건축용, 가드레일 Architectural field, Guard rail
	방열 분체 Heat sink powder coating		○	○			온도다운 효과 Temperature down by heat emission	산업용, LED갓, 브레이크 패드 Industrial field, LED cover, Brake pad
	고광택 분체 High gloss powder coating		○		○		고광택, 고품활성 High gloss and levelling	건축용, 산업용 Architectural and industrial field
	고반사율 분체 High reflection powder coating				○		반사율값 94% Reflection rate 94%	건축용, 등기구 Architectural, light reflector Architectural field
	고경도 분체 High pencil hardness powder coating			○	○	○	고경도 3-5H 및 내스크래치성 Pencil hardness 3-5H & scrach resistance	건축용, 산업용 Architectural and industrial field
	저온경화 분체 Low curable powder coating	○	○	○			낮은 경화온도 EP : 120℃ Curable HB : 140℃ Curable PE : 150℃ Curable	두꺼운 소지 Thick substrate
	낮은 정전반발 분체 Low powder-repulsion powder coating	○	○	○	○		소지코너 도장작업 침투성 우수 Excellent spray workability into corner part	라지메이터, 휨스용 Radiator and fence screener
	MDF용 분체 MDF powder coating			○	○		MDF 도장 Medium density fiberboard coating	목재용 Wood
	스티커 부착방지 분체 Nonstick powder coating				○		외부설치물의 스티커 부착방지 기능 Nonstick effect	외장용, 건축용, 가로등 Outdoor, Architectural field, Lamp post
	초내화학성 분체 Superchemical resistance powder coating		○				내화학성, 내구성 우수 Super chemical resistance and durability	반도체장비, 냉각탑, 도금지그 Semiconductor equipment, Cooling tower, Plating hanger
	마찰대전용 분체 Tribo charging powder coating		○	○	○		마찰대전용 Tribo charging	라지메이터, 휠, 브레이크 라이닝 Radiator, Wheel, Brake pad
와이어 스트랜드용 분체 Stressed wire strand powder coating		○				강한 인장력, 유연성, 장기내구성 Strong tensile strength, flexibility and durability	가드레일, 교량 Guard rail, Bridge wire	
축광 분체 Light storing powder coating			○	○		빛 방출 지속성 우수 Long lasting light emission	소방기구, 유도기구 Fire fighting & indicator equipment	
철근용 분체 Rebar powder coating		○				유연성 및 내식성 Excellent flexibility and corrosion resistance	철근용 Reinforced bar	
강관용 분체 Pipe powder coating	Single layer	○					우수한 내식성, 부착성, 기계적물성 Excellent corrosion resistance, adhesion and mechanical property	강관피복용 Pipe coating
	Dual layer	○					2중 분체코팅 Dual top & primer coating	강관피복용 Pipe coating
	3-Layer	○					접착제와의 접착성, 내식성 Excellent adhesion to adhesive, corrosion resistance	강관피복용 Pipe coating
	Water pipe	○					수도관 내부용, Bisphenol free Water pipe inner coating	주철관내부 도장용 Iron casting inner coating
	Fitting, valve	○					충격성, 부착성 우수 Excellent impact and adhesion	관조임체 및 밸브용 Pipe fitting and valve

DURATON TROUBLE SHOOTING GUIDE

분체도료 사용시 주요 문제점 및 해결방안 (Trouble shooting guide line of powder coating)

문제점 (Trouble)	발생원인 (Possible cause)	해결방법 (Possible solution)
 색상차이 (Off color)	건조로 외부 배기가스관 이상 Improper oven exhaust	건조로 배기팬 확인 Check exhaust-vent fans.
	장시간 건조로내 방치 Bake time too long	컨베이어 속도를 적절히 조절 Adjust line speed.
	너무 높은 건조로 내부온도 Oven temperature too high	건조로 온도 확인 후 낮춤 Lower oven temperature.
	너무 낮거나 높은 피도물 도막두께 Variation of film thickness	표준도막으로 작업 Work with standard coating thickness.
	두께가 다른 피도물을 함께 경화 Hardened with different thicknesses of the substrate	피도물을 두께별로 분리하여 도장작업 Work by substrate thickness.
 크레이팅 (Crater)	부품조립후 색상차이 Different color after assembling parts	가능한 동일업체에서 도장작업 Work with the same application company as possible.
	직화식 LNG 또는 LPG 건조로 Heat source by LNG or LPG of direct fired oven	GAS CHECKING을 확인하고 내가스성 도료를 요청 Check irregular gas combustion and ask powder for anti direct gas oven.
	분체도로 설계 Powder formula	도로 제조사에 문의 Check with powder manufacturer.
	전처리 불량 Poor pretreatment	소지 표면의 전처리 상태 확인 Check the pretreatment of substrate surface.
	압축공기내 오염 Oil in the compressed air	배관라인 점검 및 도장기 전용 제습기 사용 Check the oil compressed system and use a dehumidifier exclusively.
 도막흐름 (Too much film flow-Sagging)	외부오염 Contamination from outside	실리콘화합물 오염여부 및 도장건 청소상태 확인 Check the silicone contamination and clean the gun.
	타도로 오염 Contamination with incompatible powder	새로운 도로 평가전 도장부스 청소상태와 회수도로 시스템 점검 Evaluate with a virgin powder after confirming the cleaning conditions and recycling system of the booth.
	너무 두꺼운 도막 Film thickness too thick	표준 도막두께로 관리 Control with standard film thickness.
	복잡한 피도물 형태 Complex shape of the part	전압, 토출량을 적절히 조절 Adjust gun voltage and powder feeding.
	도로의 본질적인 특성 Powder characteristic	도로 제조사에 문의 Check with powder manufacturer.
 충격성(깨짐)/굴곡성/ 부착성 불량 (Poor impact resistance/ poor flexibility/ poor adhesion)	도로 경화가 안됨 Under-cured	건조로 온도를 올리거나 건조로내 체류시간을 늘림 Increase oven temperature or increase dwell time in the oven.
	소지탈지 및 전처리불량 Poor cleaning or pretreatment	전처리 장비와 약품을 점검 Check pretreatment equipment and chemicals.
	너무 두꺼운 도막 Film thickness too high	도막두께 측정기를 이용하여 도막두께 낮춤 Reduce film thickness by adjusting the application equipment.
	도로수지 및 설계 Powder resin type or formula	도로 제조사에 문의 Check with the powder manufacturer.
	컨베이어 속도가 너무 빠름 Conveyor speed too fast	컨베이어 속도를 낮춤 Reduce conveyor speed.
 도로의 토출 불균일 (Ununiformity of the powder spraying)	가열속도가 너무 느림 Heating speed too slow	건조로 온도 측정후 조정 Check oven temperature and adjust heat power.
	너무 길고 구부러지고 납작해진 호스 Hoses kinked, flattened or too long	도로 공급호스 점검 Check powder-feed hoses.
	도로에의해 호스, 벤추리, 건내부 막힘 Hoses, pump venturies or gun clogged with powder	호스, 벤추리와 건 청소 Clean hoses, pump venturies and gun inside.
	불충분한 공기압력 Insufficient air pressure or volume	공기 공급장치 점검 Check air supply.
	회수도로 단독 사용 Reclaim used exclusively	새로운 도로와 섞어 사용 Mix with the virgin powder.
	출지 않은 호퍼내 유동 Poor fluidization	유동상태를 확인하고 공기압력을 상향조정 Check the powder fluidizing and adjust air.
	덩침이 발생한 도로 Powder blocking	도로의 보관상태 및 도로 덩침여부를 채를 이용하여 점검 Check the storage and lump conditions of the powder with a sieve.
	도장기 문제 Spraygun cause	도장건 내부를 점검하고 도장건 제조사에 문의 Check the gun inside and consult equipment supplier.

문제점 (Trouble)	발생원인 (Possible cause)	해결방안 (Possible solution)
 코너부의 도장 어려움 (Poor penetration into inside corners and recesses)	너무 높은 전압 Voltage too high	도장기 전압 낮춤 Turn voltage setting down.
	너무 높은 도장기 토출공기 압력 Powder delivery velocity too high	적당한 공기압력으로 조절하거나 도장건과 피도물 거리 조절 Turn down air setting or move gun position away from part.
	복잡한 피도물 형태 Complex shape of the part	마찰대전식 도장설비와 도로로 교체 Replace gun system with triboelectric and powder.
	도로입자가 너무 미세 Powder particles too fine	도장기 전압을 낮추고 공기압력을 줄여 도장 Turn voltage and powder delivery air setting down.
	접지가 안된 경우 Poor ground	접지상태 확인 Provide ground for all equipment.
	넓은 도장패턴 Spray pattern too wide	적절한 디플렉터로 교체 Change wrong deflector plate.
과도한 회수도로 사용량 Too much reclaim added to the virgin powder	새로운 도로랑을 늘리거나 도로입체로 확인 Increase virgin powder or contact powder producer.	

두라톤 이론도포 면적(m^2/kg) (DURATON's theoretical coverage)

도료진비중 (Specific gravity)	건조도막두께(μm) (Film thickness)								비고 (Remark)	
	20	40	50	60	70	80	100	120		
1.0	50.0	25.0	20.0	16.7	14.3	12.5	10.1	8.3	분체도료의 진비중 Powder coatings' real specific gravity	
1.1	45.5	22.7	18.2	15.2	13.0	10.4	9.1	7.6		
1.2	41.7	20.8	16.7	13.9	11.9	10.1	8.3	6.9		
1.3	38.5	19.2	15.4	12.8	11.0	9.6	7.7	6.4		
1.4	35.7	17.9	14.3	11.9	10.2	8.9	7.1	6.0		
1.5	33.3	16.7	13.3	11.1	9.5	8.3	6.7	5.6		
1.6	31.3	15.6	12.5	10.4	8.9	7.8	6.3	5.2		
1.7	29.4	14.7	11.8	9.8	8.4	7.4	5.9	4.9		
1.8	27.8	13.9	11.1	9.3	7.9	6.9	5.6	4.6		
1.9	26.3	13.2	10.5	8.8	7.5	6.6	5.3	4.4		
2.0	25.0	12.5	10.0	8.3	7.1	6.3	5.0	4.2		
									1. 백색류 Pure and off white	1.55~1.70
									2. 아이보리/회색류 Ivory/Grey	1.60~1.65
									3. 담색류 Light color	1.50~1.60
									4. 흑색 및 원색류 Black/Primary color	1.30~1.45
									5. 투명류 Clear	1.20~1.25
									* 도착효율 : 100% 가정시 Efficiency : 100% (Supposition)	

두라톤 도료소요량 및 비용계산 (DURATON's coverage and cost calculator)

$$\begin{aligned} \text{도료소요량} &= \frac{\text{건조 도막두께 Film thickness}(\mu\text{m}) \times \text{도료비중 Specific gravity}}{\text{도착효율 Efficiency}} \\ \text{도료비용} &= \frac{\text{도료 소요량 Coverage}(\text{g}/\text{m}^2) \times \text{도료가격 Unit price}(\text{₩}/\text{kg})}{1000} \end{aligned}$$

의료소요량 실예 (Coverage)



- 가로 7m x 세로 0.2m x 높이 0.1m 두께 1mm 알루미늄 바 100,000개 앞뒤 좌우측면엔
- 두라톤 HS82-WH241 제품으로 도막두께 80um, 도착효율 95%로 도장한다면

두라톤 도료소요량 = $(80\text{um} \times 1.50) / 0.95 = 126.3 \text{ g/m}^2 = 0.1263 \text{ kg/m}^2$

두라톤 이론도포율 = $(1 / 0.1263 \text{ kg/m}^2) = 7.91 \text{ m}^2/\text{kg}$

알루미늄 바 1개, 4면에 도장할 실제 소요량은?

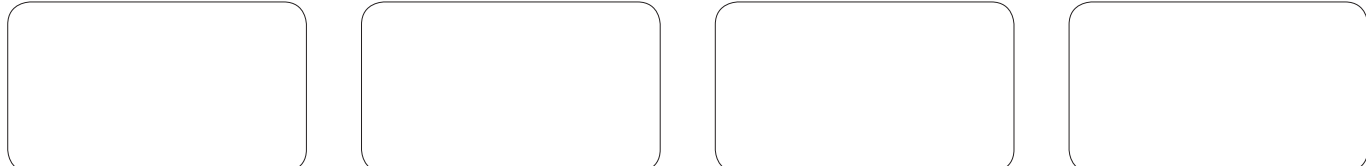
• 표면적 : 앞면 = $7\text{m} \times 0.2\text{m} = 1.4\text{m}^2$	①	뒤면 = $7\text{m} \times 0.2\text{m} = 1.4\text{m}^2$	②
측면(좌) = $7\text{m} \times 0.1\text{m} = 0.7\text{m}^2$	③	측면(우) = $7\text{m} \times 0.1\text{m} = 0.7\text{m}^2$	④
$((1)+(2)+(3)+(4)) = 4.2\text{m}^2$			

- 100,000개 표면적 : $4.2\text{m}^2 \times 100,000 = 420,000\text{m}^2$

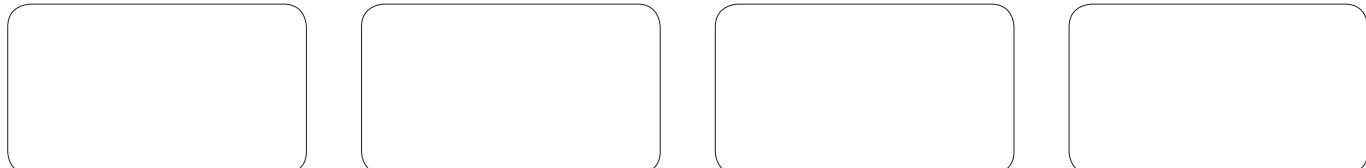
1kg으로 7.91m²를 도장하므로, 420,000m²는 몇 kg이 필요?

1kg : 7.91m² = x kg : 420,000m²

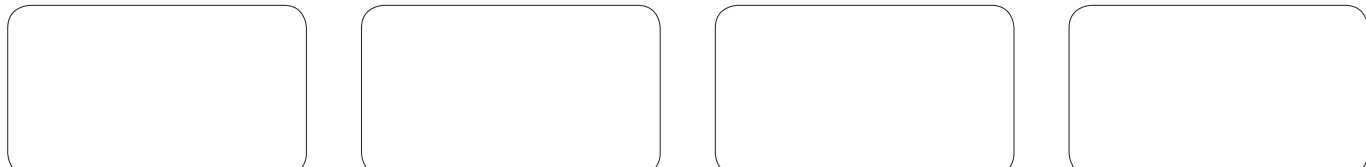
x = $(1\text{kg} \times 420,000\text{m}^2) / 7.91\text{m}^2 =$ **53,097kg**



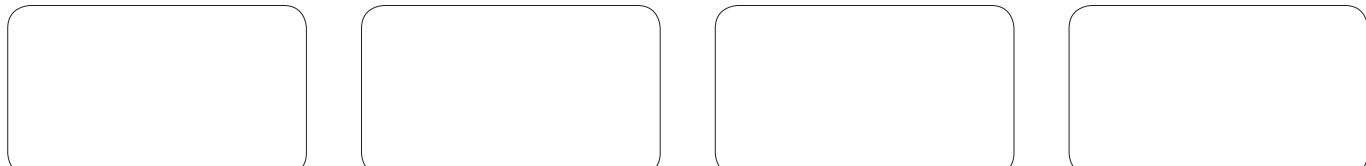
20-121 HS83-GY356 C80680 (KC) 20-122 HS84-GY246 C-80680 20-123 HS83-GY309 D80580 #KH 20-124 HS81-GY357 N5.5 (PT)



20-125 HS83-GY358 GY0259 (KC) 20-126 HS81-GY359 N4.0 (PT) 20-127 HS84-GY254 JN 진화색 20-128 HS81-GY360 N3.0 (PT)



20-129 HS81-GY361 팍타션 GY (PT) 20-130 HS83-GY362 D/GREY(OD) (PL) 20-131 HS82-GY363 RD/GREY(YJS) (PL) 20-132 HS82-BK137 BLACK(SY) (KC)



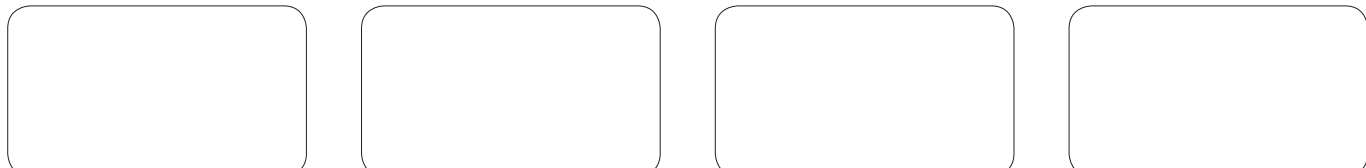
20-133 HS84-BK101 옥색 반광 40G 20-134 HS81-BK100 옥색 반광 15G 20-135 HS80-BK105 BV/ 옥색 무광 20-136 HS80-GN194 국방색(산) #D6 (PL)



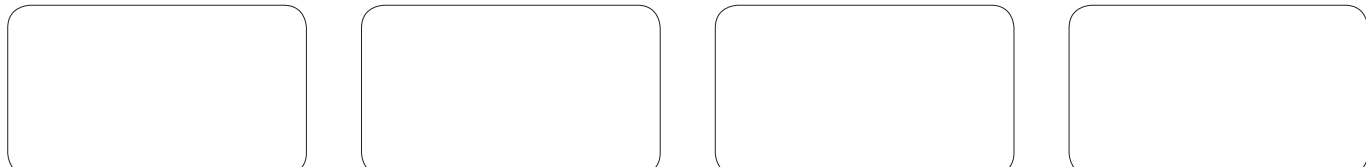
20-137 HS83-RD128 GS 적색

외부용

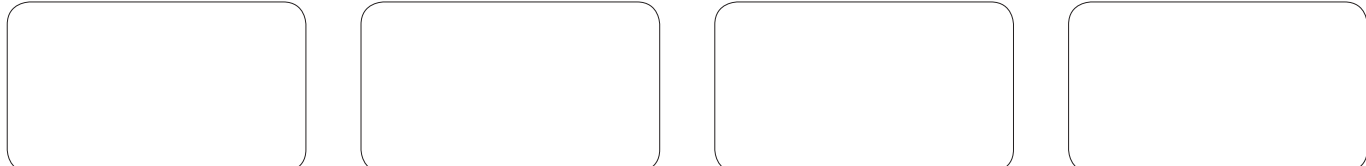
EXTERIOR
TGIC Free



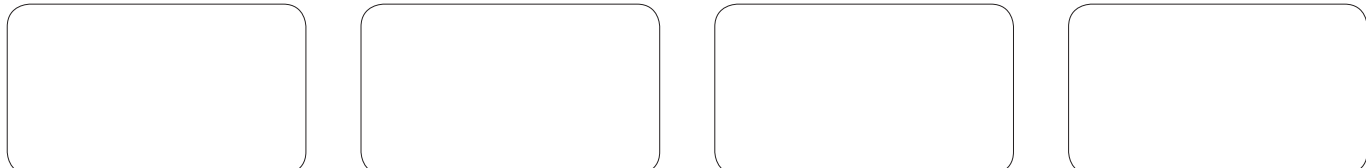
20-138 FS89-WH152 P-PURE WHITE(NP) (PT) 20-139 FS89-WH153 P-SLOT WHITE(KM 화이트) (PM) 20-140 FS89-WH154 P-PA8935 (PT) 20-141 FS69-WH155 P-WH0327(SPB8/1) (KC)



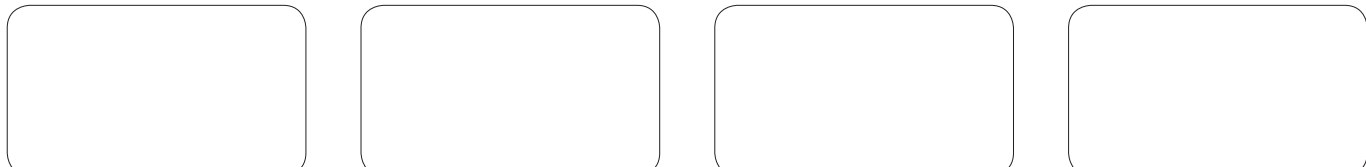
20-142 FS69-BE124 P-2.5Y9/2 (KC) 20-143 FS89-BE125 P-ND0013 (IP) 20-144 FS89-GY259 P-RAL7035 #CW 20-145 FS89-GY260 P-N7.0 (KC)



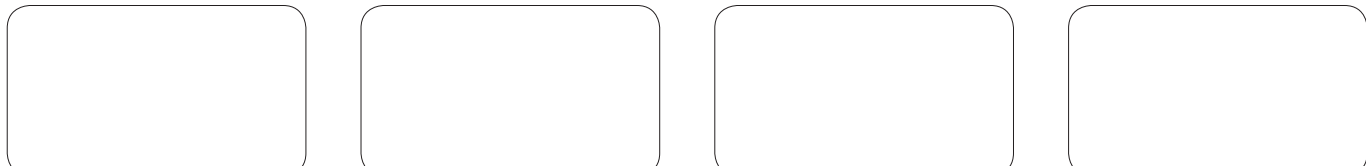
20-146 FS89-GY261 P-D-80680 (PT) 20-147 FS69-GY262 P-LPGGREY (KC) 20-148 FS89-BL151 P-COBALT/BLUE(K) (PT) 20-149 FS89-BL152 P-핀톤282C블루 (PM)



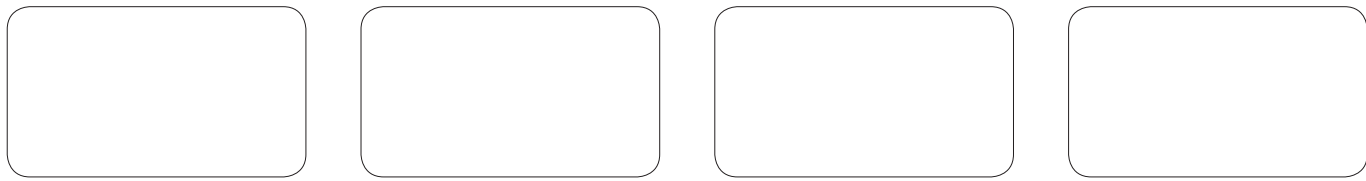
20-150 FS69-GN154 P-L/GREEN(WT) (KC) 20-151 FS69-GN155 P-9902 연녹색(SHP) (PL) 20-152 FS69-BK109 외부용 DS 옥색 유광 20-153 FS89-RD118 P-AZALEARED(KJHL) (KC)



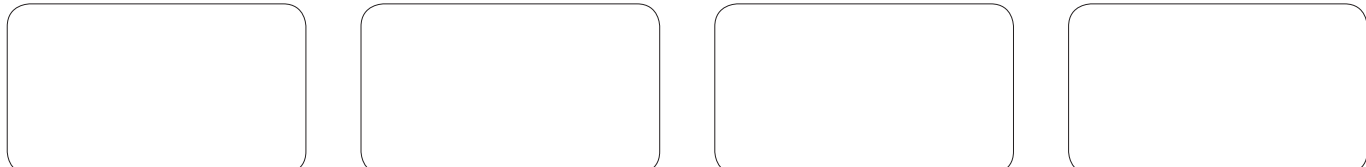
20-154 FS02-WH156 P-LH-WH053 (PT) 20-155 FS87-GY263 P-RAL7035#HS (PL) 20-156 FS84-GY229 P-RAL 7035 (IS) 20-157 FS87-GY268 P-N7.0(배전) (PL)



20-158 FS87-BE127 P-5Y7/1(HS)신 (PL) 20-159 FS02-BE128 P-5Y7/1 (KC) 20-160 FS02-BE129 P-SC2920(돌담화) (KC) 20-161 FS02-GY264 P-7.5BG6/1.5 (KC)



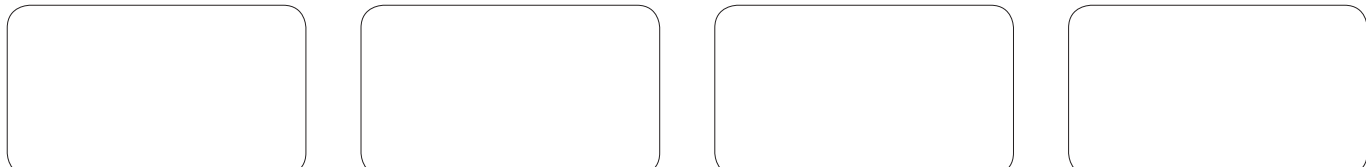
20-162 FS01-GN156 P-EVERGREEN (PT) 20-163 FS03-GY159 P-기화 진화색 20-164 FS84-GY258 P-F3115 #HP 20-165 FS84-GY182 P-서울 진화색



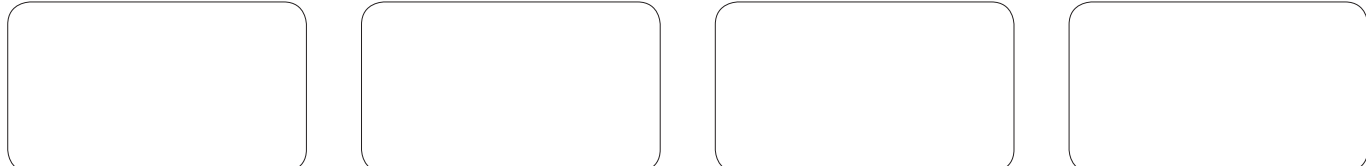
20-166 FS02-BR169 P-고양진교통 (PT) 20-167 FS03-BK122 P-BLACK(AB-1) (KC) 20-168 FS03-BK123 P-BLACK(DW) (PT) 20-169 FS03-BK124 P-N1.5 (KC)

특수무늬 & 기능성

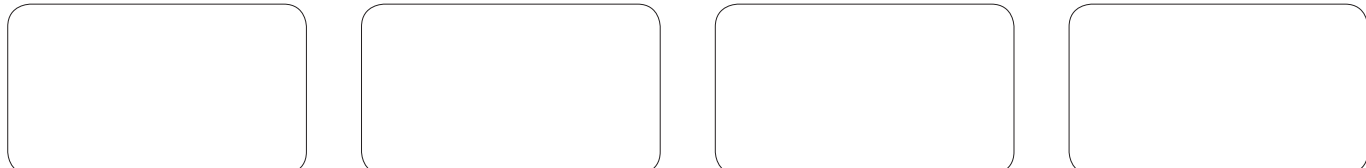
Special effect &
Functional



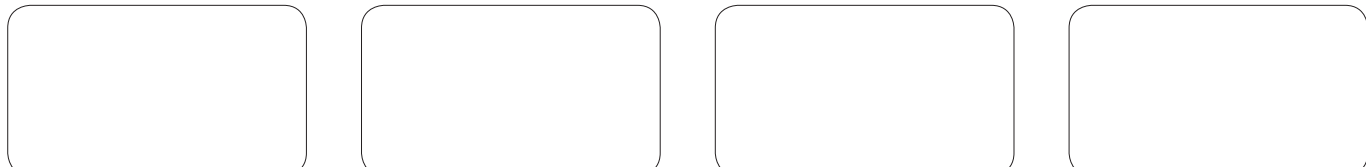
20-170 HT84-WH125 텍스처 EC4073 (IP) 20-171 HT84-WH126 텍스처 TX-WH(HD) (PT) 20-172 HT89-WH127 텍스처 9010(MR)백색 (PM) 20-173 HT89-WH107 텍스처 동경 백색



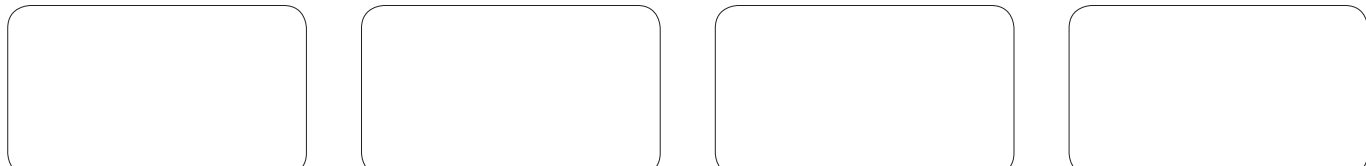
20-174 HT84-IV114 텍스처 EA404K (IP) 20-175 HT84-IV115 텍스처 WH062 (KC) 20-176 FT89-GY120 텍스처 핀톤42그레이 (PM) 20-177 HT84-IV117 텍스처 WH025 (KC)



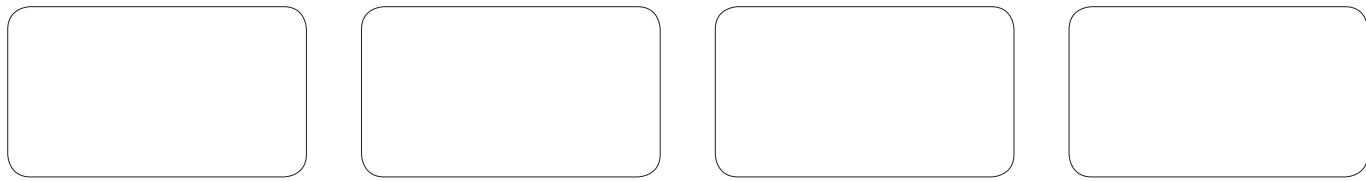
20-178 HT84-IV104 텍스처 IV001 20-179 HT84-IV118 텍스처 IV001 (KC) 20-180 HT84-GY172 텍스처 WH020 (KC) 20-181 HT84-GY173 텍스처 N8.0 (KC)



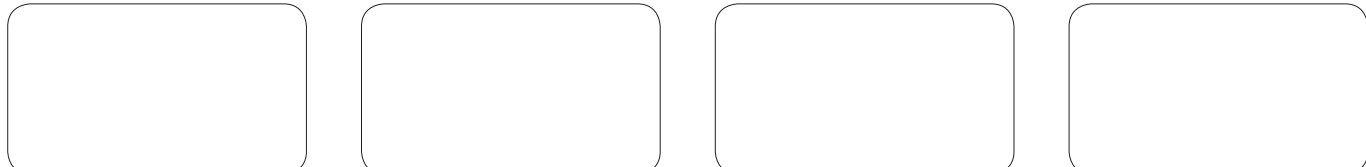
20-182 HT84-GY174 텍스처 RAL7035 (KC) 20-183 HT84-BE113 텍스처 RAL7032 (KC) 20-184 HT84-BE114 텍스처 5Y7/1(2003) (KC) 20-185 HT89-GY175 텍스처 플그레이 8C (PM)



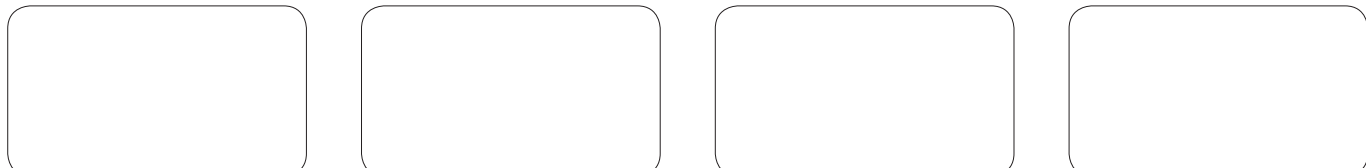
20-186 HT84-GY176 텍스처 N4.0(HDMT) (KC) 20-187 HT84-GY177 텍스처 7.5BG6/1.5(K) (KC) 20-188 FT89-BL119 텍스처 DIC252 청녹색 (PM) 20-189 HT89-BL100 텍스처 SH BLUE



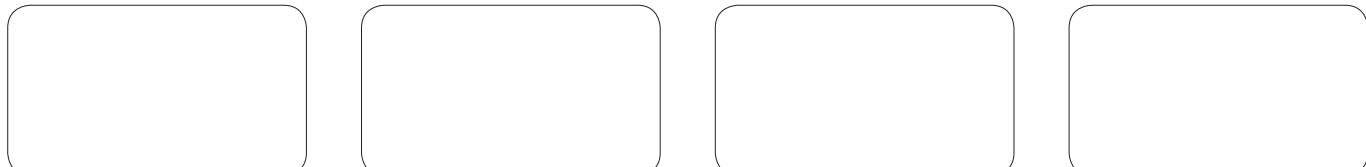
20-190 FT84-BL120 텍스처 73130B 청색 (PM) 20-191 HT84-BK118 텍스처 BK016 (KC) 20-192 HT84-BK105 텍스처 DY 옥색 20-193 HV84-WH106 샌드 HB WHITE



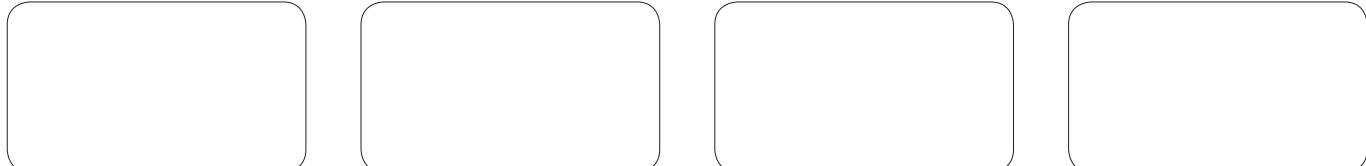
20-194 HV84-WH112 샌드 EA311K (PT) 20-195 HV84-WH113 샌드 ORIGINAL WHITE (PM) 20-196 HV84-WH114 샌드 WHITE(TW-1) (KC) 20-197 HV84-GY128 샌드 화백0482(X) (PT)



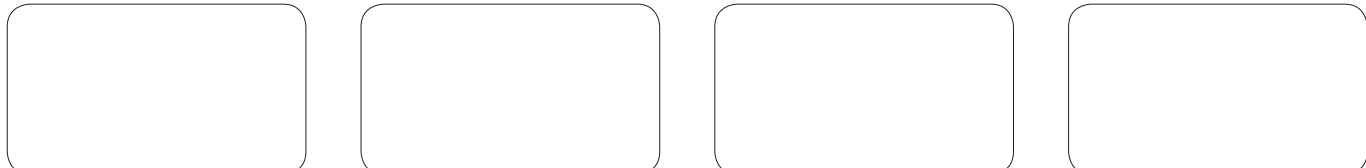
20-198 HV84-GY129 샌드 클링 실버 (PM) 20-199 FV84-BL106 P-샌드 BL010 (KC) 20-200 FV84-BK105 P-샌드 BK012 20-201 HV84-BK105 샌드 성원 BLACK



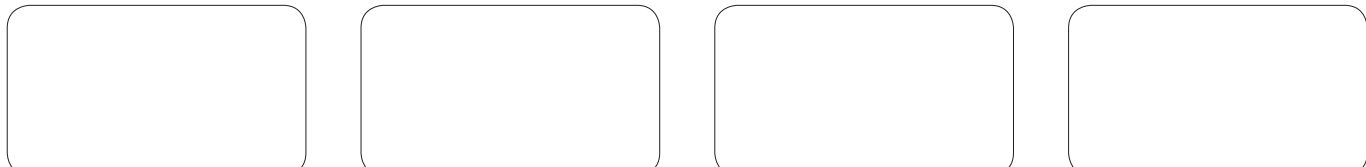
20-202 HV84-BK107 샌드 BLACK(90) (KC) 20-203 HV84-BK101 샌드 옥색(302) 20-204 HH89-IV140 알마톤 HF-BE066 (PM) 20-205 HH89-IV114 알마톤 KD IVORY



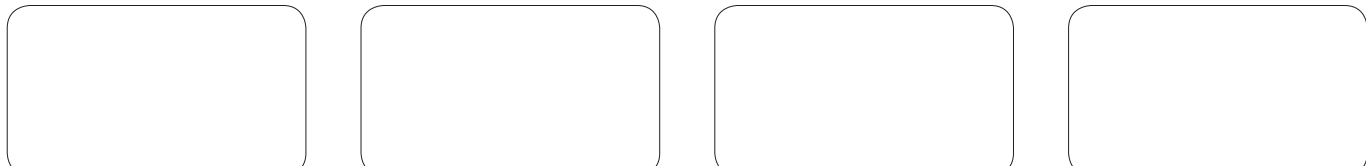
20-206 HH89-BE124 알마톤 SS베이지 20-207 FH89-IV118 P-알마톤 YJ IVORY 20-208 FH89-IV141 P-알마톤 I-MY004K(PT) 20-209 HH89-IV142 알마톤 BE024 베이지 (PM)



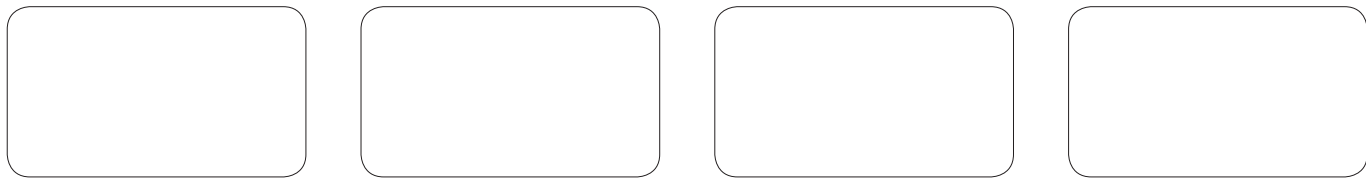
20-210 HH89-IV143 알마톤 BE024 (KC) 20-211 HH89-BE146 알마톤 RAL7032(HD) (KC) 20-212 HH89-BE147 알마톤 5Y7/1 (KC) 20-213 HH89-GY144 알마톤 RAL7035 (KC)



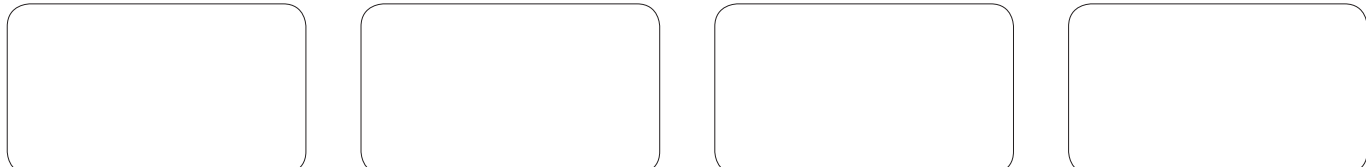
20-214 HH89-GY145 알마톤 EY019K (KC) 20-215 FH89-GY148 P-알마톤 GY001 (KC) 20-216 FH89-MS149 P-알마톤 SILVER (KC) 20-217 FH89-MS150 알마톤 L/BLACK COPPER (KC)



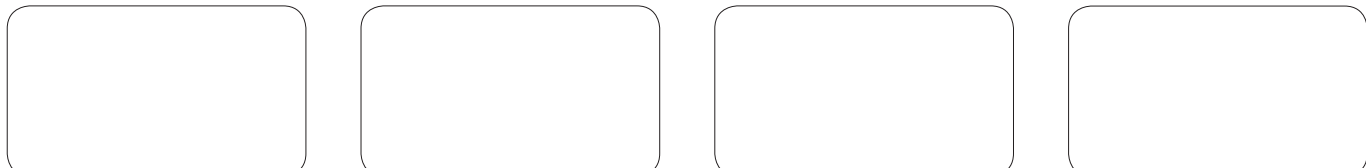
20-218 FH89-MC125 P-알마톤 YD브론즈 20-219 FH89-MS120 P-알마톤 YJ SILVER 20-220 FA84-MS124 P-METALLIC F3373 20-221 HA83-MS162 메타릭 GY0325 (KC)



20-222 HA89-MS108 9332G(MK SILVER) 20-223 HA89-MA131 H1044 은색 20-224 HA89-MA104 신우 M/은색 20-225 HA84-MS133 RG 은색



20-226 HA84-MS129 HI SUPER SILVER 20-227 HA89-MS128 PJ 은색 20-228 HA84-MS130 나산M/은박색 20-229 HA89-MG105 DH GOLD(EP)



20-230 HA89-MG161 메타릭 GD0005 (KC) 20-231 HS82-IV325 대전방지용 E34890 (KC) 20-232 HS82-IV326 대전방지용 2.5Y9/2 (KC) 20-233 HS81-BK107 대전방지용 옥색 무광



20-234 ES89-GY253 ZINC PRIMER(LC)