

**PRESENTATION  
OF  
DONGSHIN PATTERN PRINT METAL SHEET  
“PRINPIA, PRINTEX”**

***PRINPIA***

***PRINTEX***

**DONGSHIN ENGINEERING CORP, KOREA**

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## **COMPANY PROFILE**

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### **DONGSHIN SPECIAL STEEL CO., LTD(Factory)**

**1. YEAR OF ESTABLISHMENT : 1976**

**2. CAPITAL : US\$ 1.6 MILLION**

**3. ASSET : US\$ 31.6 MILLION**

**4. LOCATION :**

**1) SEOUL HEAD OFFICE(DONGSHIN ENGINEERING CORP.)**

ADDRESS : 5F HANA BUILDING, NO. 118-5, NONHYUN-DONG, KANGNAM-KU, SEOUL,  
KOREA

TEL : (82) 2-511-0898 FAX : (82) 2-511-0897

E-MAIL : [bszhang@dongshineeng.co.kr](mailto:bszhang@dongshineeng.co.kr)

WEB SITE : [www.dongshineng.co.kr](http://www.dongshineng.co.kr)

**2) POHANG FACTORY ;**

ADDRESS : 777 GUEDONG-DONG, NAM-GU, PO HANG CITY, KYONGSANGBUG-DO,  
KOREA.

TEL : (82) 54-289-8000

**2) SUZHOU FACTORY, A JOINT VENTURE IN CHINA.**

ADDRESS : SUZHOU DONGSHIN COLOR METAL SHEET CO. LTD.  
WUJIANG FENHU ECONOMIC AND TECHNOLOGICAL  
DEVELOPMENT ZONE, JIANGSU PROVINCE, CHINA.

TEL : (86) 512-325-0040,0041 FAX : (86) 512-325-0042

**5. NUMBER OF EMPLOYEE : 400**

**6. MAJOR PRODUCTS :**

- 1) P.V.C. FILM LAMINATED STEEL SHEET. ("LAMITAL")
- 2) HIGH-POLYMERIC POLYESTER RESIN PAINT COATED STEEL SHEET. ("TOPRITE")
- 3) PRE-COATED ALUMINIUM SHEET. (ALUMINIUM COLOR SHEET)
- 4) PRINTED STEEL SHEET. ("PRINPIA", "PRINTEX")
- 5) PEARLESCENT MULTI-COLORED METAL SHEET(CHAMELEON, "METALITE")
- 6) PRE-PAINTED GALVANIZED STEEL SHEET. (G.I. COLOR SHEET)  
- GREEN BOARD, WHITE BOARD, ANTI-STATIC COLOR SHEET
- 7) ELECTRO GALVANIZED STEEL SHEET. (E.G.I)

## 7. LINE CAPABILITY

LINE PROPERTY	POHANG FACTORY				
	L-LINE CONTINUOUS COATING LINE	P-LINE CONTINUOUS COATING LINE	EGL ELECTRO GALVANIZING LINE	AUTOMATIC- SLITTER LINE	P-SHEAR
OPERATION DATE	DEC. 8, 1995	JAN. 15, 2004	JUN.1, 1998	JUN. 1, 1998	APR. 15, 2004
ANNUAL CAPACITY	80,000 MT	120,000 MT	180,000 MT	120,000 MT	54,000 MT
AVAILABLE THICKNESS OF BASE METAL	0.4-1.2 MM	0.35-1.2 MM	0.4-1.6 MM	0.35-1.2 MM	0.3-1.6 MM
AVAILABLE WIDTH	500 MM- 1,300 MM	500 MM- 1,350MM	600 MM- 1,250 MM	MAX. 1,720 MM	MAX.1,250 MM
PRINTING WIDTH	500MM – 1,250MM	500MM- 1,250MM			
SLITTING & SHEARING	450MM – 3,000MM	COIL	COIL	3 W SLITTING	450-5000 MM
CHARACTERISIC	3 W SLITTING 3W(under 1,750MM) 2W(under 3,000MM)	BOTH SIDE EMBOSSING TENSION LEVELLER	1 Side Embossing, Phosphating Anti-Fingerprinting, CR-Free Anti-Fingerprinting		
LINE SPEED	70 MPM	120 MPM	120 MPM	200MPM	50MPM

## 8. MAJOR BUYER

- 1) DOMESTIC : SAMSUNG, LG, DAEWOO, MANDO PRECISION,  
CENTURY AIR CONDITIONER ... ETC
- 2) OVERSEAS
- TAIWAN : SANYO, TATUNG, MATSUSHITA, TECO, SAMPO, KAISUNG,  
SHYEMAW, CHIAOSHENG, YAHCHIAO, ETC
- JAPAN : IG KOKYO, SHINKYU SANKYO, TOSTEM, SHOWA LINK,  
TOHO SHEET FRAME, NIKKEI SHOJI. ETC.
- U. S. A. : SANYO
- MALAYSIA : ONKYO, PIONEER, SAMSUNG, SANYO. ETC.
- INDONESIA : SHARP, SAMSUNG, L/G. ETC
- CHINA : KELON, XINFEI, YANG ZI, WHIRLPOOL. PANPAN, FUMING, A&D,  
XINXIN, ABC, HUNTER DOUGLAS, MEIBAO, ETC
- THAILAND : SHARP, TOSHIBA, SAMSUNG. ETC.
- UAE : S.A.T
- SAUDI ARABIA : IBSF
- CYPRUS : YIANNAKIS ANDREOUS, ETC
- BRUNEI : GOLDMYNE, CHOPKIMSHAN, ETC.

# TECHNICAL DATA

## 1. INTRODUCTION

### 1.1. CONCEPTION OF P.C.M(PRE-COATED METAL)

1.1.1. P.C.M MEANS PRE-COATED METAL IN COMPARISON WITH SPRAY COATED METAL AFTER FABRICATION SUCH AS BENDING.

1.1.2. P.C.M IS CLASSIFIED AS FOLLOWS ACCORDING TO THE SHAPES AND USAGES.

		P.C.M	POWDER, SPRAY	REMARK
CHARACTERISTICS		PRE-COATING	PRE-FABRICATION	TREND IS MOVING TO PCM
COMPARISON	STRONG POINT	-WORKING ENVIRONMENT -PRODUCTIVITY -HIGH QUALITY	-THICKER COATING IS AVAILABLE - FREE DESIGN	
	WEAK POINT	CUTTING PART	WORKING ENVIRONMENT	
COATING SYSTEM		ROLL COATING	SPRAY, POWDER	

### 1.2. PRINPIA (PRINTED SHEET)

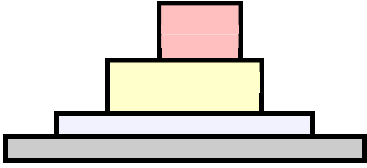
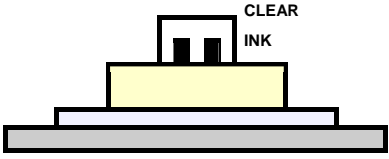
1.2.1. VARIOUS PATTERN SUCH AS WOOD, STONE, ETC PRINTED ON THE SURFACE OF BASE METAL.

1.2.2. PAINT RESINS AND PATTERNS CAN BE APPLIED TO THE USAGE OF CLIENTS

### 1.3. PRINTEX(TEXTURE TYPE PRINTED SHEET)

1.3.1. VARIOUS COLORS AND TEXTURE TYPE PATTERNS PRINTED ON THE SURFACE OF BASE METAL.

1.4. COMPARISON OF P.C.M

	PCM			
	MONO COLOR SHEET		PRINT SHEET	
	TOPRITE	COLOR SHEET	PRINT	PRINTEX
CHARACTERISTICS	EASY FABRICATION	HIGH DURABILITY	PATTERN	PATTERN & EMBOSSING
USAGE	ELECTRONIC APPLIANCE	EXTERIOR CONSTRUCTION	ELECTRONIC APPLIANCE, CONSTRUCTION	INTERIOR CONSTRUCTION
BASE METAL	EG,CR,GA	GI	EG, CR, GA, GI	
SECTION				
REMARK			PRINT & CLEAR COATING	

## **2. USAGE**

### **2.1. PRINPIA**

- 2.1.1. METAL PATTERN : OUTER & INNER SURFACE FOR ALUMINUM HONEYCOMB COMPOSITE PANEL AND EXTERIOR AND INTERIOR USAGE
- 2.1.2. BRICKS PATTERN : OUTER SURFACE FOR STEEL WALL SANDWICH PANEL FOR FACTORY AND BUILDING, FLASHINGS
- 2.1.3. WOOD PATTERN : INTERIOR SURFACE FOR STEEL WALL SANDWICH PANEL FOR FACTORY AND BUILDING, PARTITION, SURFACES OF STEEL DOOR, OA PARTITION
- 2.1.4. ASPHALT PATTERN : ROOF CLADDING PANEL OR SHEET
- 2.1.5. STONE PATTERNS : SIDING BOARD, EXTERIOR WALL CLADDING PANEL FOR COMMERCIAL BUILDING

### **2.2. PRINTEX**

- 2.2.1. BLACK TEXTURE PATTERN : TOP CASE OF AUDIO, VTR, ETC.
- 2.2.2. COLOR TEXTURE PATTERN : OA PARTITION, INTERIOR PARTITION, STEEL DOORS, STEEL CABINET, FURNITURE, CEILING PANEL, FLASHINGS, ETC.

## **3. SPECIFICATION OF PRINTEX**

### **3.1. APPLICATION**

THIS SPECIFICATIONS ARE APPLIED TO PRINTEX, TEXTURE PRINTED METAL SHEET WITH PATTERN AND FEELING OF TEXTURE MATERIAL.

### **3.2. BRAND NAME**

PRINTEX(PRINT+TEXTURE) IS HIGH QUALITY OF PRE-COATED METAL, WHICH FINISHED WITH CLEAR PAINT FOR THE PURPOSE OF SHOWING MATERIAL FEELING OF TEXTURE AFTER PRINTING VARIOUS PATTERN OF 1  $\mu\text{m}$  THICKNESS UNDER 3 COAT - 3 BAKE SYSTEM.(DETAILS ARE SAME AS PER TABLE 2)

### **3.3. KINDS OF PRINTEX**

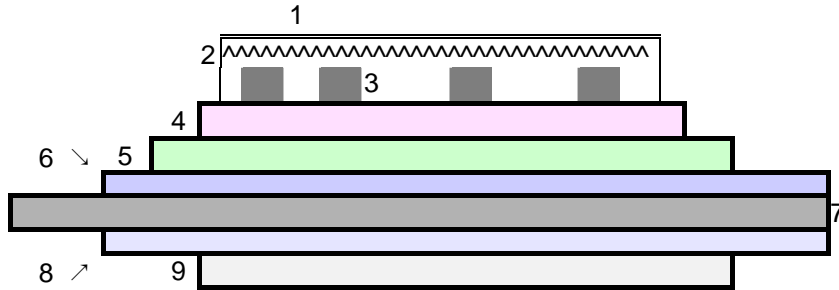
#### **3.3.1. CLASSIFICATION OF PRINTEX BY MATERIAL FEELINGS**

<b>CLASSIFICATION</b>	<b>APPLIED CLEAR</b>	<b>REMARK</b>
TEXTURE	TEXTURE CLEAR	LARGE SIZE EMBOSSED
WRINKLE	WRINKLE CLEAR	SMALL SIZE EMBOSSED

[TABLE 1]

### 3.4. QUALITY

3.4.1. THE SHAPE AND SECTION ARE AS FOLLOWING PICTURE 1.



[PICTURE 1]

### 3.4.2. MATERIALS

MATERIALS SHALL BE APPLIED TO FOLLOWING TABLE 2

NO	LAYER	THICK-NESS	TYPE	CHARACTERISTICS
1	PROTECTION FILM	50,60 $\mu$ m	POLY-ETHYLENE	TO PREVENT SURFACE SCRATCHING OR POLLUTING, THE FILM CAN BE USED AS OPTION.
2	CLEAR	10~20 $\mu$ m	POLYESTER	TEXTURE CLEAR LAYER FOR PROTECTION OF PRINT LAYER AND SUSTAIN MATERIAL FEELINGS
3	PRINT	UNDER 1 $\mu$ m		IT CREATES VARIOUS PATTERNS, WHICH CAN BE COATED TO 3 COLORS ON A PATTERN
4	BASE COATING	15~20 $\mu$ m	HIGH POLYMER, POLYETSER	WITH ITS EXCELLENT MECHANICAL, CHEMICAL PROPERTIES AND BEAUTIFUL COLORS, IT ACTS
5	PRIMER COATING	3~5 $\mu$ m	POLYESTER	THE LAYER TO IMPROVE THE ADHESIVE POWER, FABRICATION, ANTI-RUST PROPERTIES WITH BASE LAYER
6	CHEMICAL TREATMENT	UNDER 1 $\mu$ m	Cr	CHROMATED TREATMENT FOR IMPROVING ANTI-RUST PROPERTIES OF BASE METAL
7	BASE METAL	0.4~1.2 mm	CR,EGI, GI,GA,AL	EXTERIOR : GI, GA, AL. INTERIOR : CR, EGI
8	BACK COATING	5 $\pm$ 2 $\mu$ m	EPOXY	LAYER FOR BETTER ANTI-RUST, ANTI-SCRATCH AND BEST ADHESIVE POWER WITH OTHER MATERIALS SUCH AS POLYURETHANE

[TABLE 2]

### 3.5. OUTER FEATURE

3.5.1. IT IS NOT ALLOWED TO BE FOUND ANY SCRATCH, CHIPPING, INCORRECT PRINTING, RUST, ETC ON THE SURFACE OF SHEET.

3.5.2. THE QUALITY SHALL BE CONTROLLED BASED ON KSD 3520 5.

### 3.6. SIZE

3.6.1. SIZE ALLOWANCE BY PRODUCT LENGTH, DIAGONAL, WIDTH

PRODUCT LENGTH	ALLOWANCE		
	LENGTH	DIAGONAL	WIDTH
UNDER 1,000MM	± 0.5 MM	± 0.5 MM	± 0.5 MM
1,000~2,000MM	± 0.5 MM	± 0.5 MM	± 0.5 MM
OVER 2,000MM	± 0.5 MM	± 0.5 MM	± 0.7 MM

[TABLE 3]

3.6.2. ALLOWANCE IN THICKNESS

WIDTH THICKNESS	600~1,000MM	1,000~1,250MM	1,250~1,600MM
0.4 ~ 0.5MM	± 0.05 MM	± 0.05 MM	± 0.06 MM
0.6 ~ 0.7MM	± 0.06 MM	± 0.06 MM	± 0.07 MM
0.8 ~ 0.9MM	± 0.07 MM	± 0.08 MM	± 0.09 MM
1.0 ~ 1.2MM	± 0.08 MM	± 0.09 MM	± 0.10 MM
1.3 ~ 1.6MM	± 0.10 MM	± 0.11 MM	± 0.12 MM

[TABLE 4]

### 3.7. STORAGING

3.7.1. STOCK THE PRODUCTS AT THE PLACE, WHICH HAS CONDITIONS OF GOOD AIR VENTILATION WITHOUT DUSTS, HUMIDITY AND DO NOT STOCK WITH CHEMICALS TO PREVENT BEING RUST.

3.7.2. KEEP THE PRODUCTS IN DRY AND SAFE FROM DAMAGE OF COATING

3.7.3. IN CASE OF COLD STORAGE, SUSTAIN THE TEMPERATURE OF MATERIALS TO PLUS TEMPERATURE



#### 4. PHYSICAL PROPERTIES

##### 4.1. THE CHARACTERISTICS OF PRINPIA SHALL BE APPLIED TO PHYSICAL PROPERTIES

TEST ITEM		METHOD OF TEST		STANDARD	REMARKS
COLOR		TOLERANCE BOUNDARY SAMPLE		NO PROBLEM WITHIN TOLERANCE	
		COLOR METRY		$\Delta E = \text{UNDER } 1.0$	
GLOSS		GLOSS METER(60%)		HIGH 90% ↑ MIDDLE 40-80% LOW 40% ↓	
PENCIL HARDNESS		UNI-PENCIL (500g WEIGHT)		OVER "HB"	
COATING THICKNESS		ELCOMETER	TOP	$25 \pm 10_{\mu m}$ (PVDF : $35 \pm 10_{\mu m}$ )	
			BACK	$5 \pm 2_{\mu m}$	
1ST PROPERTY	ERICHSEN	1mm x H100 x ERICHSEN 6MM		100/100	TAPPING COMPULSORY /NATURAL PEELING OFF(PERFECT 100/100)
	IMPACT	500g x 50cm		NO CRACK	
2ND PROPERTY (100°Cx1Hr DIPPING)	ERICHSEN	1mm x H100 x ERICHSEN 6MM		100/100	TAPPING COMPULSORY /NATURAL PEELING OFF(PERFECT 100/100)
	IMPACT	C 1/2" x 1Kg x 50cm		NO CRACK	
BENDING PROPERTY		25±5°C x BENDING 180°	CR	2T NO CRACK	
			EG	2T NO CRACK	
			GI	3T NO CRACK	
			AL	5T NO CRACK	
HEAT RESISTANCE		170°C x 1 Hr		$\Delta E \leq 2.0$	
M.E.K.		RUB OFF WITH MEK CLOTH		OVER 30 TIMES	
CONTAMI-NATION	OIL INK #300	20±2°C X 24Hr LATER WIPE OFF WITH ACETONE		EASY TO REMOVE AND NO TRACE	MONAMI OIL MAGIC PEN OF RED, BLUE, BLACK
	LIPSTIC				
CHEMICAL RESISTANCE	5% HCL	20±2°C X24Hr LATER(SPOT) WIPE OFF WITH WATER AND DRY		NO BLISTER	
	5% NaOH				
	TOLUENE				
	XYLENE				
CORROSION RESISTANCE		35±2°C X 5% NaCl SPRAY	CR	100Hr	NO MORE 2MM BLISTER ON THE CROSS-CUT SIDE
			EG	250Hr	
			GI	500Hr	
			AL	500Hr	
QUICK WEATHER RESISTANCE TEST		QUV $\Delta E < 2.0$		500Hr (PVDF : 1500Hr)	

[TABLE 5]

**5. CERTIFICATES**

**5.1. ABS(AMERICA) : IMO Res.a 653(16)**

**5.2. DNV(NORWAY) : IMO FTPC Parts 2 & 5**

**5.3. NKK(JAPAN) : FTPC PART 5**

PLEASE SEE ATTACHED CERTIFICATES.