

MATERIAL SAFETY DATA SHEET

Section 1.

Manufacturer : SKS Paint CO., LTD. Address : 384-4,CHEONG CHEON DONG,BUPYEONG-GU,INCHEON,KOREA Emergency telephone number : 82-2-2266-7722		-- HMIS -- HEALTH : 2 FLAMMABILITY : 3 REACTIVITY : 0 PERSONAL PROTECT : H
Date : 2006.	Prepared by	
Hazard Rating : 0=least, 1=slight, 2=moderate, 3=high, 4=extreme, R=chronic H = splash goggles, gloves, synthetic apron & vapor respirator		
Trade name HIURELON-HB (GLOSS 30%) MAIN LIQUID		Chemical name BASE OF POLYURETHANE PAINT

Section 2-1. HAZARDOUS COMPONENTS

NO.	COMPONENT	CAS NO.	% by wt	Vapor pressure (mmHg 20℃)
1	2-ETHOXYETHANOL ACETATE	111-15-9	3 ~ 5	2
2	XYLENE	1330-20-7	7 ~ 9	6.6
3	TITANIUM DIOXIDE	13463-67-7	3 ~ 5	N/A
4	BUTYL ACETATE	133-86-4	5 ~ 7	10
5	AROMATIC NAPHTHA, LIGHT	64742-95-6	7 ~ 10	< 10 mmHg (25℃)

(N/A = Not Applicable)

Section 2-2. OCCUPATIONAL EXPOSURE LIMITS

NO.	(OSHA) PEL / TWA	PEL / CEILING	PEL / STEL	SKIN
1	100 PPM	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	15 mg/m ³	N/E	N/E	N/E
4	150 PPM	N/E	150 PPM	N/E
5	150 PPM	N/E	N/E	N/E
NO.	(ACGIH) TLV / TWA	TLV / CEILING	TLV / STEL	SKIN
1	5 PPM	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	100 mg/m ³ TOTAL DUST	N/E	N/E	N/E
4	150 PPM	N/E	200 PPM	N/E
5	100 PPM	N/E	150 PPM	N/E

(N/E = Not Established)

Section 3. PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling point	N/E	°C	Specific gravity (H ₂ O=1)	1.1 ±0.1	at 25 °C
Vapor pressure (at 20°C)	N/A	mmHg	Melting point	N/A	°C
Vapor density (Air=1)		> 1	Freezing point	N/A	°C
Evaporation rate (BAc=1)		> 1	Percent volatile by volume	52 ± 2%	
Solubility in water	Nil		Solubility in other solvent	Solved in almost all solvents	
Appearance and odor All Color Liquid with solvent odor.					

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash point (Method Used) 25 °C (Closed Cup)			
Flammable limits (%)	LEL	UEL	FLAMMABILITY CLASSIFICATION (OSHA)
	1.1	7.0	FLAMMBLE LIQUID - CLASS IC
Extinguishing media CO ₂ , Foam , Dry chemical, Halon (Avoid water)			
Special fire fighting procedures . Air supplied face masks where expose to fumes occurs.			
Unusual fire and explosion hazards . Isolate from heat, electrical equipment, Sparks and opened flame. . Wear Self-Contained breathing apparatus.			

Section 5. REACTIVITY DATA

Stability	Unstable		Conditions to avoid contact with elevated temperatures or flame. Store below 50°C
	Stable	●	
Incompatibility (Materials to avoid) Strong oxidizing agents			
Hazardous decomposition or by-products No information			
Hazardous Polymerization	May occur		Condition to avoid Contact with elevated temperatures, strong alkalis, oxidizing materials.
	Will not occur	●	

Section 6. HEALTH HAZARD DATA

Route of entry	Inhalation?	Skin?	Ingestion?
	Yes	Yes	No
Health hazard (Acute and chronic) Inhalation : May cause nose and throat irritation Skin and eye contact : May cause skin irritation or burning of the eyes.			
Signs and symptoms of exposure Eye contact may cause irritation or burning.			
Medical conditions Generally aggravated by exposure.			
Emergency and first aid procedures Inhalation : Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention. Skin Contact : Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed. Eyes Contact : Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately. Ingestion : Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately. Note to Physician: For ingestion, consider gastric lavage.			

Section 7. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled. Wash spill down with water.
Waste disposal method Incinerate absorbed material in accordance with federal, state and local regulations.
Precautions to be taken in handling and storing Although it is not corrosive to skin, avoid eye and skin contact.
Other precautions Wash thoroughly after handling and before eating.

Section 8. CONTROL MEASURES

Respiratory protection (Specify type)	Do not breathe mist of paint	
Ventilation	Local exhaust	Recommend
	Mechanical (General)	Recommend
	Special	None
	Other	None
Protective gloves	Rubber gloves.	
Eye protection	Safety goggles.	
Other protective clothing or equipment	Eye washer, safety shower	
Work/Hygienic practices	None	

MATERIAL SAFETY DATA SHEET

Section 1.

Manufacturer : SKS Paint CO., LTD. Address : 384-4,CHEONG CHEON DONG,BUPYEONG-GU,INCHEON,KOREA Emergency telephone number : 82-2-2266-7722		-- HMIS --	
		HEALTH	: 2
		FLAMMABILITY	: 3
Date : 2006.	Prepared by	REACTIVITY	: 2
		PERSONAL PROTECT	: H
Hazard Rating : 0=least, 1=slight, 2=moderate, 3=high, 4=extreme, R=chronic H = splash goggles, gloves, synthetic apron & vapor respirator			
Trade name		Chemical name	
HARDENER OF HIURELON-HB (GLOSS 30%)		HARDENER OF POLYURETHANE PAINT	

Section 2-1. HAZARDOUS COMPONENTS

NO.	COMPONENT	CAS NO.	% by wt	Vapor pressure (mmHg 20°C)
1	HDI BASED POLYISOCYANATE RESIN	8182-81-2	55 ~ 63	N/A
2	XYLENE	1330-20-72	20 ~ 24	6.6
3	2-ETHOXYETHANOL ACETATE	115-15-9	10 ~ 13	2

(N/A = Not Applicable)

Section 2-2. OCCUPATIONAL EXPOSURE LIMITS

NO.	(OSHA) PEL / TWA	PEL / CEILING	PEL / STEL	SKIN
1	N/E	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	100 PPM	N/E	N/E	N/E
NO.	(ACGIH) TLV / TWA	TLV / CEILING	TLV / STEL	SKIN
1	N/E	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	5 PPM	N/E	N/E	N/E

(N/E = Not Established)

Section 3. PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling point	N/E	°C	Specific gravity (H ₂ O=1)	1.00 ± 0.1	at 25 °C
Vapor pressure (at 20°C)	N/A	mmHg	Melting point	N/A	°C
Vapor density (Air=1)		> 1	Freezing point	N/A	°C
Evaporation rate (BAc=1)		> 1	Percent volatile by volume	60 ± 2 %	
Solubility in water	Nil		Solubility in other solvent	Solved in almost all solvents	
Appearance and odor All Color Liquid with solvent odor.					

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash point (Method Used) 29 °C (Closed Cup)			
Flammable limits (%)	LEL	UEL	FLAMMABILITY CLASSIFICATION (OSHA)
	1.1	7.0	FLAMMBLE LIQUID - CLASS IC
Extinguishing media CO ₂ , Foam , Dry chemical, Halon (Avoid water)			
Special fire fighting procedures . Air supplied face masks where expose to fumes occures.			
Unusual fire and explosion hazards . Isolate from heat, electrical equipment, Sparks and opened flame. . Wear Self-Contained breathing apparatus.			

Section 5. REACTIVITY DATA

Stability	Unstable		Conditions to avoid contact with elevated temperatures or flame. Store below 50°C
	Stable	●	
Incompatibility (Materials to avoid) Strong oxidizing agents			
Hazardous decomposition or by-products No information			
Hazardous Polymerization	May occur	●	Condition to avoid Contact with water, alcohols, amine, strong base, metal compounds, surface active materials and strong oxidizers.
	Will not occur		

Section 6. HEALTH HAZARD DATA

Route of entry	Inhalation?	Skin?	Ingestion?
	Yes	Yes	No
Health hazard (Acute and chronic)			
Inhalation : May cause nose and throat irritation			
Skin and eye contact : May cause skin irritation or burning of the eyes.			
Signs and symptoms of exposure			
Eye contact may cause irritation or burning.			
Medical conditions			
Generally aggravated by exposure.			
Emergency and first aid procedures			
Inhalation : Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.			
Skin Contact : Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.			
Eyes Contact : Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.			
Ingestion : Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.			
Note to Physician: For ingestion, consider gastric lavage.			

Section 7. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled.
Wash spill down with water.
Waste disposal method
Incinerate absorbed material in accordance with federal, state and local regulations.
Precautions to be taken in handling and storing
Although it is not corrosive to skin, avoid eye and skin contact.
Other precautions
Wash thoroughly after handling and before eating.

Section 8. CONTROL MEASURES

Respiratory protection (Specify type)	Do not breathe mist of paint	
Ventilation	Local exhaust	Recommend
	Mechanical (General)	Recommend
	Special	None
	Other	None
Protective gloves	Rubber gloves.	
Eye protection	Safety goggles.	
Other protective clothing or equipment	Eye washer, safety shower	
Work/Hygienic practices	None	

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Section 1.

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Date : 2006.	Prepared by	
Hazard Rating : 0=least, 1=slight, 2=moderate, 3=high, 4=extreme, R=chronic H = splash goggles, gloves, synthetic apron & vapor respirator		
Trade name HIURELON-HB (GLOSS 80%) MAIN LIQUID		Chemical name BASE OF POLYURETHANE PAINT

Section 2-1. HAZARDOUS COMPONENTS

NO.	COMPONENT	CAS NO.	% by wt	Vapor pressure (mmHg 20℃)
1	2-ETHOXYETHANOL ACETATE	111-15-9	3 ~ 5	2
2	XYLENE	1330-20-7	7 ~ 9	6.6
3	TITANIUM DIOXIDE	13463-67-7	3 ~ 5	N/A
4	BUTYL ACETATE	133-86-4	5 ~ 7	10
5	AROMATIC NAPHTHA, LIGHT	64742-95-6	7 ~ 10	< 10 mmHg (25℃)

(N/A = Not Applicable)

Section 2-2. OCCUPATIONAL EXPOSURE LIMITS

NO.	(OSHA) PEL / TWA	PEL / CEILING	PEL / STEL	SKIN
1	100 PPM	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	15 mg/m ³	N/E	N/E	N/E
4	150 PPM	N/E	150 PPM	N/E
5	150 PPM	N/E	N/E	N/E
NO.	(ACGIH) TLV / TWA	TLV / CEILING	TLV / STEL	SKIN
1	5 PPM	N/E	N/E	N/E
2	100 PPM	N/E	150 PPM	N/E
3	100 mg/m ³ TOTAL DUST	N/E	N/E	N/E
4	150 PPM	N/E	200 PPM	N/E
5	100 PPM	N/E	150 PPM	N/E

(N/E = Not Established)

Section 3. PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling point	N/E	°C	Specific gravity (H ₂ O=1)	1.1 ±0.1	at 25 °C
Vapor pressure (at 20°C)	N/A	mmHg	Melting point	N/A	°C
Vapor density (Air=1)		> 1	Freezing point	N/A	°C
Evaporation rate (BAc=1)		> 1	Percent volatile by volume	52 ± 2%	
Solubility in water	Nil		Solubility in other solvent	Solved in almost all solvents	
Appearance and odor All Color Liquid with solvent odor.					

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash point (Method Used) 23 °C (Closed Cup)			
Flammable limits (%)`	LEL	UEL	FLAMMABILITY CLASSIFICATION (OSHA)
	1.1	7.0	FLAMMBLE LIQUID - CLASS IC
Extinguishing media CO ₂ , Foam , Dry chemical, Halon (Avoid water)			
Special fire fighting procedures . Air supplied face masks where expose to fumes occurs.			
Unusual fire and explosion hazards . Isolate from heat, electrical equipment, Sparks and opened flame. . Wear Self-Contained breathing apparatus.			

Section 5. REACTIVITY DATA

Stability	Unstable		Conditions to avoid contact with elevated temperatures or flame. Store below 50°C
	Stable	●	
Incompatibility (Materials to avoid) Strong oxidizing agents			
Hazardous decomposition or by-products No information			
Hazardous Polymerization	May occur		Condition to avoid Contact with elevated temperatures, strong alkalis, oxidizing materials.
	Will not occur	●	

Section 6. HEALTH HAZARD DATA

Route of entry	Inhalation?	Skin?	Ingestion?
	Yes	Yes	No
Health hazard (Acute and chronic)			
Inhalation : May cause nose and throat irritation			
Skin and eye contact : May cause skin irritation or burning of the eyes.			
Signs and symptoms of exposure			
Eye contact may cause irritation or burning.			
Medical conditions			
Generally aggravated by exposure.			
Emergency and first aid procedures			
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Skin Contact : Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.			
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Respiratory protection (Specify type)	Do not breathe mist of paint	
Ventilation	Local exhaust	Recommend
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Other protective clothing or equipment	Eye washer, safety shower	
Work/Hygienic practices	None	

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Evaporation rate (BAc=1)		> 1	Percent volatile by volume	60 ± 2 %	
Solubility in water	Nil		Solubility in other solvent	Solved in almost all solvents	
Appearance and odor All Color Liquid with solvent odor.					

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash point (Method Used) 32 °C (Closed Cup)			
Flammable limits (%)	LEL	UEL	FLAMMABILITY CLASSIFICATION (OSHA)
	1.1	7.0	FLAMMBLE LIQUID - CLASS IC
Extinguishing media CO ₂ , Foam , Dry chemical, Halon (Avoid water)			
Special fire fighting procedures . Air supplied face masks where expose to fumes occures.			
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Section 5. REACTIVITY DATA

Stability	Unstable		Conditions to avoid contact with elevated temperatures or flame. Store below 50°C
	Stable	●	
Incompatibility (Materials to avoid) Strong oxidizing agents			
Hazardous decomposition or by-products No information			
Hazardous Polymerization	May occur	●	Condition to avoid Contact with water, alcohols, amine, strong base, metal compounds, surface active materials and strong oxidizers.
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Section 6. HEALTH HAZARD DATA

Route of entry	Inhalation? Yes	Skin? Yes	Ingestion? No
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Medical conditions Generally aggravated by exposure.			
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Section 8. CONTROL MEASURES

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	Mechanical (General)	Recommend
	Special	None
	Other	None
Protective gloves	Rubber gloves.	
Eye protection	Safety goggles.	
Other protective clothing or equipment	Eye washer, safety shower	
Work/Hygienic practices	None	