Harwal Polyurethane Systems

TECHNICAL DATA SHEET

HP – SP-3040

General Properties and Applications **HP – SP-3040** is a polyol formulation used to produce spray foam insulation in multi layers for roofing, wall and basements with a density of 43-47 kg/m³. It contains all the raw material and auxiliaries necessary for the production of rigid polyurethane foam including the blowing agent. The system is CFC free and contains HCFC 141B as blowing agent that is in compliant with the environment regulations at present. HP - SP-3040 along with MDI can be used on roofs made of metal, concrete, wood etc.

Sampling Moisture access should be prevented; formulation should be agitated before sampling.

Specification Property	**Value**	**Unit of measurement**
Hydroxyl number (theoretical)	300 ± 20	mg KOH/g
Water content	1.00 ± 0.1	% by wt.
Viscosity @ 25 °C	200 ± 50	cps
Specific Gravity @ 23 ^{0}C	approx. 1,13	-

Packaging 200l steel drums - IBC, tank truck and tank containers on request

Storage Shelf life from the time of production: 6 months if stored in sealed moisture tight containers.
Recommended storage temperature: 25°C

Labeling and REACH applications This product data sheet is only valid in conjunction with the latest edition of the corresponding Safety Data Sheet. Any updating of safety-relevant information in accordance with statutory requirements will only be reflected in the Safety Data Sheet, copies of which will be revised and distributed. Information relating to the current classification and labelling, applications and processing methods and further data relevant to safety can be found in the currently valid Safety Data Sheet.

Directions for Processing **HP** – SP-3040 system is designed for processing on high and low pressure machines that are able to work at mixing ratios of 1:1 by volume, the machine parameters have to be selected in such way to ensure proper mixing.

Environmental Consideration and Substrate Temperatures: Applicators must recognize and anticipate climatic conditions prior to application to ensure highest quality foam and to maximize yield. Ambient air and substrate temperatures, moisture and wind velocity are all critical determinants of foam quality. Extreme ambient air and substrate temperature will influence the chemical reaction of the two components, directly affecting the yield, adhesion, and the resultant physical properties

of the foam insulation. To obtain optimum results, system should be spray-applied to substrates when ambient air and surface temperatures are between 10ºC and 50°Cº. All substrates to be sprayed must be free of dirt, soil, grease, oil and moisture prior to the application of HP Spray. Moisture in any form: excessive humidity (>85%R.H.) rain, fog, or ice will react chemically will adversely affect system performance and corresponding physical properties. Application should not take place when the ambient temperature is within 3°C of the dew point. Wind velocities in excess of 20 km per hour may result in excessive loss of exotherm and interfere with the mixing efficiency of the spray gun affecting foam surface texture, cure, physical properties and will cause overspray. Precautions must be taken to prevent damage to adjacent areas from fugitive overspray. Applicators should ensure the safety of the jobsite and construction personnel by posting appropriate signs warning that all "hot work" such as welding, soldering, and cutting with torches should take place no less than 35 feet from any exposed foam. If "hot work" must be performed all spray polyurethane foam should be covered with an appropriate fire or welder's blanket, and a fire watch should be provided.

Processing Equipment:

2:1 transfer pumps are recommended for material transfer from container to the proportioner. The plural component proportioner must be capable of supplying each component within ± 2% of the desired 1:1 mixing ratio by volume. Hose heaters should be set to deliver 50°C to 55°C materials to the spray gun. These settings will ensure thorough mixing in the spray gun mix Chamber in typical applications. Optimum hose pressure and temperature will vary with equipment type and condition, ambient and substrate conditions, and the specific application. Some equipment may require you to heat drums to achieve optimum material temperature. It is the responsibility of the applicator to properly interpret equipment technical literature, particularly information that relates acceptable combinations of gun chamber size, proportioner output, and material pressures. The relationship between proper chamber size and the capacity of the proportioner ’s pre - heater is critical. Contact your machine supplier representative for specific recommendations, pricing, and availability of spray and auxiliary equipment.

Per Pass Application:

Applicators should limit HP Spray thickness to 2,5 cm per pass for optimal processing and physical properties.

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Handling and Safety:
Respiratory protection is MANDATORY! Contact HP Systems for a copy of the Model Respiratory Protection Program developed by API or visit their website at www.polyurethane.org. Avoid contact with skin, eyes, and clothing. Open containers carefully, allowing any pressure to be relieved slowly and safely. Wear chemical safety goggles and rubber gloves when handling or working with these materials. In case of eye contact, immediately flush with large amounts of water for at least fifteen minutes, consult a physician immediately. In case of skin contact, wash area with soap and water. Wash clothes before reuse.

Guide formulation	**parts by weight**
HP – SP-3040	100
MDI (any low functional)	100

Foaming data by the hand mixing method with 3000 rpm at raw material temperature of 23°C

Cream time	4 ± 1	Seconds
Gel time	10 ± 1	Seconds
Free Rise Density	30 ± 1	kg/m$_3$
Applied Density	45 ± 2	kg/m$_3$

Typical properties to be achieved under recommended application parameters:
Density approx. 43-47 kg/m^3
Compressive strength > 100 kPa
Fire rating (DIN4102-1) B3
Water absorption < 1 %
Initial thermal conductivity (ASTM C518) 0.0218 W/Km
Working Temperature Range -40 to 100°C
Close Cell Content 98% +/-2

These values are given only as a guide and must be verified in each individual case on finished

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SAFETY DATA SHEET

HP – SP-3040

1.Identification of the substance/preparation and the company
HP – SP-3040
Application:
Polyol components for the production of polyurethanes
Interplast co.ltd
P.O. Box 77031, Dubai, UAE − Tel: +971 4 885 0474
2. Composition/information on ingredients
Polyol preparation with alkaline character
N,N−dimethylcyclohexylamine
weight %: 1,0−<2,5
CAS No.: 98−94−2 Index No.: −−
EEC No.: 202−715−5
Classification: R10; C R34; Xn R20/21/22; N
R51−53 tris(2-chloroisopropyl)-phosphate
Concentration [wt.-%]: < 10
CAS-No.: 13674-84-5
EINECS-No.: 237-158-7
Classification: Xn R22
3. Hazards identification
1,3-Isobenzofurandione, polymer with 2,2'-oxybis[ethanol]
Tris(1-chloroisopropyl)phosphate
Hazard statements:H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H412 Harmful to aquatic life with long lasting effects.
H420 Harms public health and the environment by destroying ozone in the upper atmosphere
Supplementary hazardous characteristics and labeling elements:
Contains:
dibutyltin dilaurate
EUH208 May produce an allergic reaction.
4. First−aid measures
General: Remove contaminated clothing.
If aerosol or vapor is inhaled in high concentrations: Take the person In to the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.
After skin contact: After contact with skin, wash immediately with plenty of water and soap. Consult a doctor in the event of a skin reaction.
4. First−aid measures (Continuation)
After eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.
After swallowing: Should the product be swallowed seek medical advice.
5. Fire−fighting measures
Extinguishing media: CO_2, foam, dry powder;in cases of larger fires, water spray should be used.
For reasons of security unsuitable extinguishing media: water jet Firemen have to wear self−contained breathing apparatus.
6. Accidental release measures
Ensure adequate ventilation/exhaust ventilation. Keep unauthorized persons away. Put on protective equipment (see chapter 8). Do not empty into drains. Take up with absorbent for chemicals or, if necessary with dry sand and store in closed containers. For further disposal measures see chapter 13.

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7. Handling and storage
Handling: When handling observe the usual precautionary measures for chemicals. Avoid contact with eyes and skin.
Storage: Keep container tightly closed and dry.
Storage temperature regarding personal safety: max. 50 °C.
Further specific information see our :"Technical Information"
VCI storage class: D
(VCI = German Association of the Chemical Industry)(1)
8. Exposure controls/Personal protection
Hand protection: Conditionally suitable materials for protective gloves; DIN EN 374−3:
nitrile rubber − NBR: thickness: >=0,35 mm;
Breakthrough time not tested; dispose of immediately after contamination.
Eye protection: Wear eye/face protection.
Body protection: Wear suitable protective clothing.
Protection and hygienic measures: Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work. Keep working clothes separate. Change badly soiled or soaked clothing. Safety precautions for handling freshly molded polyurethane parts: see section 16
9. Physical and chemical properties Form: liquid
Colour: yellowish
Odour: like amine
Setting point: −10 °C
Initial boiling point: 140 °C at 1013 hPa
Density: 1,086 kg/l at 20 °C
Vapour pressure: 8 hPa at 20 °C
35 hPa at 50 °C
45 hPa at 55 °C
Solubility in water: partially miscible
Flash point: >100 °C DIN EN 22719
Ignition temperature: 345 °C DIN 51794
Explosive limits: Limits not determined.
10. Stability and reactivity
Thermal decomposition: Does not occur until initial boiling point.
Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.
Hazardous reactions: Note exothermic reaction with isocyanates.
11. Toxicological information
No toxicological studies of the product have yet been carried out.An expected acute oral toxicity as LD_{50} in rat will be in the order of >2000 mg/kg as derived from products with similar composition.Irritant/caustic effect analogous to products with similar composition.
Effect on the eyes: A weak irritation at the eye could be expected.
Effect on the skin: Weak irritation on the skin possible.The dangerous constituents of preparation have been tested with the following results.
data on N,N−dimethylcyclohexylamine
Acute toxicity:
LD_{50} oral, rat: 164−1230 mg/kg
LD_{50} dermal, rat: >400 mg/kg
LC_{50} inhalation, rat: 4,45 mg/l, 4 h of exposure
Skin compatibility, rabbit: corrosive
Eye irritation, rabbit: severely irritant to corrosive
Data on tris(2-chloroisopropyl)-phosphate
Acute toxicity, oral:

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LD50 rat: 632 mg/kg
Primary skin irritation:
tris(2-chloroisopropyl)-phosphate
rabbit
Result: non-irritant
Primary mucosae irritation:
tris(2-chloroisopropyl)-phosphate
rabbit Result: non-irritant
11. Toxicological information (Continuation)
Primary skin irritation, rabbit: corrosive
Primary mucosae irritation, rabbit: severely irritant data on aminopolyether
In analogy to test results for similarly composed products:
Acute toxicity:
LD_{50} oral, rat: 1000−2000 mg/kg
12. Ecological information
Do not allow to escape into waters, wastewater or soil.
Ecotoxicological studies of the product are not available.
The dangerous constituents of preparation have been tested with the following results.
data on N,N−dimethylcyclohexylamine
Biodegradability: >60 %, i.e. readily biodegradable.
Degradation rate in 28 days.
(Method: OECD 301 B)
Acute fish toxicity: LC_{50} = 22−46 mg/l
Test species: Golden orfe (Leuciscus idus) Duration of test: 96 h
Acute bacterial toxicity: EC_{50} = 206 mg/l
Test organism: Pseudomonas putida Duration of test: 17 h
Acute toxicity for daphnia: EC_{50} = 75 mg/l
Test species: Daphnia magna Duration of test: 48 h
Acute toxicity for algae: EC_{50} = 0,31 mg/l
Tested on: Green algae (Desmodesmus subspicatus) Duration of test: 72 h
Data on tris(2-chloroisopropyl)-phosphate Biodegradability:

tris(2-chloroisopropyl)-phosphate
14 % 28 d, i.e. not readily degradable
Toxicity to fish:
tris(2-chloroisopropyl)-phosphate
LC50 56,2 mg/l
Test species: Brachydanio rerio (zebra fish) Duration of test: 96 h
Acute bacterial toxicity:
tris(2-chloroisopropyl)-phosphate
EC50 784 mg/l
Tested on: activated sludge Duration of test: 3 h
data on aminopolyether
Biodegradability: 23 %, i.e. not readily degradable.
Degradation rate in 28 days.
(Method: EU L 383A:C4 − OECD 301 F)
Acute fish toxicity: LC_0 = >100 mg/l
Test species: Zebra barbel (Danio rerio) Duration of test: 96 h
(Method: 993c − OECD 203)
13. Disposal considerations
Dispose in accordance with applicable international, national and local laws, ordinances and statutes.

For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used. After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip−dry"), they can be sent to an appropriate collection point set up within the framework of the existing take−back scheme of the chemical industry. Containers must be recycled in compliance with national legislation and environmental regulations.

14. Transport information

GGVSE: −− UN: NODG PG: −−
RID/ADR: −− UN: NODG PG: −−
ADNR: −− UN: NODG PG: −−
GGVSee/IMDG Code: −− UN: NODG PG: −− MPO: −−
ICAO−TI/IATA−DGR: −− UN: NRES PG: −−
Declaration for land shipment: −−
Declaration for sea shipment: −−
Declaration for shipment by air: −−
Other information:
Not dangerous cargo. Avoid heat above +50 °C. Keep separated from food stuffs.

15. Regulatory information

No labelling is required in accordance with the EC directives.
German "TA−Luft": With certain processes, for example spraying or processing at high temperatures, a check should be carried out to ensure compliance with the German "TA−Luft" technical instruction on air pollution control.

15. Regulatory information (Continuation)

Water pollution class (WGK): 1 − slightly hazardous to water
WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999−05−17)
Any existing national regulations on the handling of dangerous substances should be observed.

16. Other information

Text of all R phrases referred to in sections 2 and 3:
R 10: Flammable.
R 20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R 22: Harmful if swallowed.
R 24: Toxic in contact with skin.
R 34: Causes burns.
R 51/53: Toxic to aquatic organisms, may cause long−term adverse effects in the aquatic environment.
Safety precautions for handling freshly molded polyurethane parts:
Depending on the production parameters, any uncovered surfaces of polyurethane moldings produced using this raw material may contain traces of substances (e. g. starting and reaction products, catalysts,) with hazardous characteristics.
Skin contact with traces of these substances must be avoided. When demolding or otherwise handling freshly molded polyurethane parts, protective textile gloves must be worn as a minimum. Their palm and finger areas should preferably be coated on the outside with nitrile rubber, PVC or polyurethane. Protective gloves should be changed daily. The wearing of protective clothing suited to the conditions normally encountered when handling freshly molded polyurethane parts is recommended. The presented Safety Data Sheet has been altered. The reason for the alteration is as follows:
revised text (see chapter 2, 4, 5, 6, 7, 8, 9, 11, 12, 15 and 16)
This safety data sheet replaces all previous information.
Revised and valid from: see date of issue
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The above details do not imply any guarantee concerning composition, properties or performance.