

PRINTING DIVISION

**TECHNICAL DATA SHEETS FOR NC - BASE
HIGH PIGMENT INK AND SOLVENTS FOR
SUPERIOR PRINTING.**

(NON TRANSFERABLE COLORS)

FLOW INK & COATINGS PVT LTD

Plot No.: 24-25, Changodar Industrial Estate, Part-II,
Nr. Democare Laboratory,
Nr. Canal, Changodar, Ahmedabad-382213.
Gujarat, India.
CIN: U24119GJ1995PTC024817

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An ISO 9001 &
14001 Certified Company

REF No.:	TDS/005
Rev. Date:	09/09/2015
Issue Date:	09/09/2015
Page No.:	1 to 6
Version No.	FP-001-1516

Technical Data Sheet

PRODUCT IDENTIFICATION: FLOW PREMIUM

Description:	<p>Flow Premium Inks are highly pigmented and low viscosity Flexo as well as Gravure (Common) Inks for both reverse and surface Printing applications (the later after adding Flow Premium Inks Slip & Scuff Additive, with solvent Balance optimized to give best results at high press speeds due to its excellent chemistry management.</p> <p>Due to its excellent technical properties, Flow Premium M SERIES is suitable for all kind of packing structures (e.g. all kind of sealing such as Horizontal, Vertical, Lap)</p> <p>Flow Premium Inks are free from banned solvents (like Toluene and MEK) and are exclusively formulated with high Molecular weight, non-migrating plasticizing resins in combination with Nitrocellulose.</p>
End Use:	<p>Flow Premium Series is designed especially for printing of carry bags, bread bags, shopping bags, snack food and frozen food packaging etc.</p>
Printing Machine	<p>Flow Premium Series is tailored to run effortlessly on High Speed CI Flexo Presses as well as on Flexo Stack Presses. These inks perform equally well when employed on Gravure printing machines also.</p> <p>Flow Premium inks are originally designed as very highly pigmented - suitable for fast running CI Flexo presses with very fine anilox rollers. These inks could be easily converted to Gravure Printing application by appropriately diluting with solvents and extender medium - this in-house dilution for Gravure printing not only provides common ink advantage, but also saves a chunk of cost in terms of transport / logistics and preliminary margins of supplier. The advantages mentioned here are in addition to the flexibility in terms of ink strength adjustments as per the printing job requirements.</p> <p>Note - 1: As mentioned above these inks originally are of very high strength, suitable for use on very high speed CI Flexo machines with very fine Anilox rollers. To use these inks on Gravure presses we provide a conversion table, where a measured addition of reducer and medium at the press side readies the inks for Gravure applications.</p> <p>Note - 2: Gravure ready version of these inks, with separate code numbers having GR suffix in front of them also are available.</p> <p>Note - 3: For very large customers and/or Export purpose the inks could be supplied as NC concentrate + Single Let Down Technology Varnish + Scuff and Slip Additive.</p> <p>Note - 4: as per the peculiar practices in certain countries these also could be supplied without the addition of the BOPP Adhesion Promoter - In such cases the printer adds the BOPP Adhesion Promoter at the Press Side as per the Printing Substrate and its Dyne Level etc.</p>

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Printing Substrate	<ul style="list-style-type: none"> ➤ Polyethylene (Corona treated > 38 Dyne/cm) – Surface ➤ BOPP (Corona treated 38-42 Dyne/cm) – Surface & reverse ➤ Acrylic coated polypropylene ➤ Pearlized BOPP - Surface ➤ CC-PET or Chemically Coated PET – Surface (reverse – bond depends on the PET Chemical Coatings as well as adhesive employed) ➤ Other films after verifications
Special Features	
<ul style="list-style-type: none"> ➤ Very high pigment strength inks ➤ Excellent flow at low viscosity ➤ High solids ➤ Good Printing Stability ➤ High Transparency and Excellent Gloss ➤ Good Blocking resistance ➤ Excellent adhesion ➤ Good scuff resistance & slip properties: Obtained on addition of FICPL Inks Slip & Scuff Additive (Code No.) ➤ Excellent solvent release, enabling high press speeds to be used. ➤ Designed to exhibit a low coefficient of friction (surface application) ➤ Excellent freeze thaw resistance: making the ink suitable for the extreme cold weather countries ➤ Good heat resistance (> 160°C, 3 bar, 1-sec, Treated film, under standard laboratory conditions). ➤ Alcohol and Acetate based (free of Toluene/ MEK / MIBK / Butenol – Banned Solvents) ➤ These inks also exhibit good Deep Freeze, Water and Milk resistance properties – for specialized packing applications in these areas customer is advised to inform FICPL R&D in advance. 	

Color Range:

Full palette of colours is available, which may only occasionally be restricted by specific end use resistance characteristics requirement.

Process Range:

Product Codes	Product Description	L.F. (1-8 Scale)
FIC/FP 2104	NC. Lam BLACK SUPER	7
FIC/FP 2105	NC. Lam YELLOW P	4
FIC/FP 2105 PC	NC. Lam YELLOW PC	4
FIC/FP 2105 S	NC. Lam YELLOW SUPER	4
FIC/FP 2106	NC. Lam BLUE	7
FIC/FP 2103 P	NC. Lam MAGENTA P	4 to 5
FIC/FP 2103 PC	NC. Lam MAGENTA PC	4 to 5
FIC/FP 2103 S	NC. Lam MAGENTA SUPER	4to 5



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White and Extender Medium:

Product Codes	Product Description	L.F. (1-8 Scale)
FIC/FP 2107	NC Lam MEDIUM EXTENDER	N.A.
FIC/FP 2101 O	NC Lam WHITE OPAQUE	7
FIC/FP 2101 E	NC Lam WHITE EURO	7

Standard Range:

Product Codes	Product Description	L.F. (1-8 Scale)
FIC/FP 2105	NC Lam YELLOW OPAQUE	4
FIC/FP 2150	NC Lam YELLOW WARM	4
FIC/FP 2110	NC Lam BLUE REFLEX	3 to 4
FIC/FP 2109	NC Lam BLUE ROYAL	3 to 4
FIC/FP 2141	NC Lam RED WARM	3 to 4
FIC/FP 2102	NC Lam RED	4
FIC/FP 2130	NC Lam AR/SR or Geranium RED	5 to 6
FIC/FP 2112	NC Lam ORANGE	5 to 6
FIC/FP 2108	NC Lam GREEN	7
FIC/FP 2111 NAR	NC Lam NON AR/SR VIOLET	3 to 4
FIC/FP 2111 ARSR	NC Lam AR/SR VIOLET	7

Support Additives:

Product Codes	Product Description	Active % Content
FIC/FP/ADD 2131	Flow NC Lam ADHESION PROMOTER	xxxx
FIC/FP/SS 2132	Flow NC Lam SLIP & SURFACE SCUFF ADDITIVE	xxxx

Printing & Processing

	DIN Cup 4	AFNOR Cup 4	Ford 4 Cup	Zahn 2 cup
Gravure printing	15-19 sec	16-21sec	14-18 sec	20-23 sec
Flexo printing	19-22 sec	21-25 sec	20-24 sec	22-26 sec

*The above figures are given for guidance only.

Viscosity adjustment should be undertaken only after the ink is well mixed and the ink is at room temperature. Viscosity is adjusted by adding solvents slowly in small quantities. (See under "Dilution").



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The Actual viscosity used will depend on a number of factors, including print design, press conditions, the machine running speed and the desired colour characteristics.

Dilution:

Solvent and solvent blends used for dilution may need to be adjusted in accordance to printing conditions: Namely, printing process, printing speed, oven capability and graphics such as solids, lines, half tone and process printing.

To achieve good DOT RE-PRODUCTIONS in below 7 % dot areas, Use Extra Retarder

Depending on printing conditions, the following solvents may be used as retarder or accelerator,

Accelerator:- Ethyl Acetate

Medium:- N-Propyl Acetate, Ethyl Alcohol

Slow:- N-Propanol

Retarder:- Methoxy propanol, Ethoxy propanol, Dowanol PM

Reducing System:

We recommend few basic ratios:

Reducers For Flexo:

ETHYL ALCOHOL-99% PURE	70
ETHYL ACETATE	20
DOWANOL - PM	10

ETHYL ALCOHOL-99% PURE	70
N-PROPYL ACETATE	20
DOWANOL - PM	10

N-PROPANOL	80
ETHYL ACETATE	20

N-PROPYL ALCOHOL	80
N-PROPYL ACETATE	20



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Reducers For Garvure:

ETHYL ALCOHOL-99% PURE	50
ETHYL ACETATE	50

ETHYL ACETATE	70
ETHYL ALCOHOL-99% PURE	30

ETHYL ACETATE	70
N-PROPANOL	30

ETHYL ACETATE	50
N-PROPYL ACETATE	50

*It is always better to mix the solvents before adding to the ink.

Shelf Life:

The inks and varnishes of this series have under normal conditions a shelf life of at least 6 months.

Normal conditions means:

- Storage in tightly closed containers
 - No admixtures
 - Temperature not exceeding 25°C for weeks or 30°C for days.
- Short time excess-temperatures e.g. at transport are not harmful. The products are not sensitive to frost.

"Over-stored inks (typical symptoms : fall in gloss, shift in shade, formation of odour and / or viscosity increase) may normally - *off colour being exceptions* - be used the same way as residual inks by controlled admixture to fresh inks Increased viscosity due to long-time storage of inks may generally be adjusted by addition of a slightly higher amount of thinner than the usual.

Please take notice of the following:

1. The performance results indicated in this literature are only indicative under controlled conditions of laboratory with virgin & standard packaging grade films. Please do not use lower grades or substandard films. FLOW INK & COATINGS Pvt Ltd., will not take any responsibility for abnormal results



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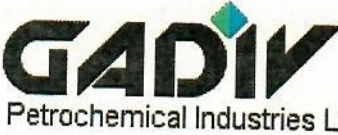
2. Liability: While the information outlined is given in good faith, it does not constitute a guarantee and neither is one implied as to the specific end use suitability of any product. The customers should always evaluate the suitability of products to their own satisfaction

2.1. FLOW INK & COATINGS Inks is responsible only to the tune of replacing the ink consumed in case of any printing related problems, clearly assigned to in-compatibility with the ink system recommended by FLOW INK & COATINGS Inks for the print job under consideration.

If you require any further information please do not hesitate to contact us or visit our website.



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SAFETY DATA SHEET	 GADIV Petrochemical Industries Ltd.
Substance Name: TOLUENE	Page 1 of 10

Complying with 1907/2006/EEC Regulation of 18 December 2006 ("REACH Regulation") and REGULATION (EC) No 1272/2008 (CLP)

Section 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/ UNDERTAKING

Identification of the substance/preparation

Substance Name: TOLUENE

Trade names: TOLUENE

Synonyms: Benzene, methyl-, Methacide, Methane, phenyl-, Phenylmethane, Methylbenzene, Methylbenzol, Toluol

CAS # : 108-88-3

EC #: 203-625-9

Common/important uses of the substance/preparation: Toluene is used as an industrial and laboratory solvent, as intermediate in production of chemicals and pharmaceuticals, and as a component in fuel.

Company/undertaking identification

Supplier/Manufacturer: GADIV PETROCHEMICAL INDUSTRIES Ltd.
P.O.B 32 HAIFA
Tel: +972-4-8788020
Fax: +972-4-8788018
E-mail: Gadiv@orl.co.il

E-mail address of person responsible for this SDS: gamiram@orl.co.il

Emergency telephone number (including hours of operation): +972-4-8788643

Section 2. HAZARDS IDENTIFICATION

According to EC Directive 2001/59/EC

Most Important Hazards

Physical / Chemical Hazards:

R11 Highly flammable.

Health Hazards:

R38 Irritating to skin.

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

R63 Possible risk of harm to the unborn child.

R65 Harmful: may cause lung damage if swallowed.

R67 Vapours may cause drowsiness and dizziness.

MATERIAL SAFETY DATA SHEET

SECTION 1 :----- CHEMICAL IDENTIFICATION -----

Name : **Ethyl acetate**

SECTION 2 :----- COMPOSITION/INFORMATION ON INGREDIENTS ---

CAS # :141-78-6
MF : C₄H₈O₂
EC No. :205-500-4
M.W. :88.10g/mol

ADDITIONAL INFORMATION

Ethyl acetate CAS No.: 141-78-6

SYNONYMS

Acetic ether.

SECTION 3 :----- HAZARDS IDENTIFICATION -----

Label Precautionary Statements

Flammable , irritant.

SECTION 4 :----- FIRST - AID MEASURES -----

If swallowed , wash out mouth with water provided person is conscious call a physician.
Wash contaminated clothing before reuse.If inhaled , remove to fresh air.If not breathing give artificial respiration . If breathing is difficult , give oxygen.In case of skin contact , wash with soap and copious amounts of water for at least 15 minutes.In case of eye contact Immediately irrigate with copious quantity of water for at least 15 minutes.Eyelids to be held open.Seek medical attention.

SECTION 5 :----- FIRE FIGHTING MEASURES -----

EXTIGUISHING MEDIA

Water spray ,carbon dioxide, dry chemical powder or appropriate foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self contained breathing apparatus and protective clothing .Prevent contact with skin and eyes.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

Flammable liquid .Emits toxic fumes under fire conditions.Vapour may travel considerable distance to source of ignition and flash back.Container explosion can occur under fire conditions. Forms explosive mixtures in air.

SECTION 6 :----- ACCIDENTAL RELEASE MEASURES -----

Wear self-contained breathing apparatus ,Chemical safety goggles, rubber boots and heavy rubber gloves..Sweep up , place in a bag and hold for waste disposal.Avoid raising dust.Ventillate area and wash spill site after material pick up is complete. Evacuate area. Shut off all sources of ignition.

SECTION 7 :----- HANDLING AND STORAGE -----

Handling & Storage Precautions : Keep tightly closed. Store in a cool dry place.Wash thoroughly after handling.

Keep away from heat , sparks , and open flame

SECTION 8 :----- EXPOSURE CONTROLS/PERSONAL PROTECTION -----

Safety shower and eye bath .Mechanical exhaust required. Avoid contact with eyes., skin & clothing.Compatible resistant gloves.NIOSH/MSHA-approved respirator.Compatible chemical resistant gloves. Chemical safety goggles . Avoid prolonged or repeated exposure.

SECTION 9 :----- PHYSICAL AND CHEMICAL PROPERTIES -----

:Liquid	Boiling Pt./Range	:76.5-77.5°C	Physical State
	Appearance	:--	M.Pt./Freezing Pt. :-84°C
	Vapour Pressure @20°C	: 73 mmHg	Odour : --
	Vapour Density (Air = 1)	: 3g/l	Solublility in water@30°C
:-z1076	Evaporation rate	: ---	Specific Gravity(Water =
1):0.902	pH	:--	Others : ----
		Coeff of water/oil distribution	: ----

SECTION 10 :----- STABILITY AND REACTIVITY -----

Chemical Stability :Stable
Incompatibility with other materials :Oxidizing agents ,sensitive to moisture.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

CO, CO₂.

HAZARDOUS POLYMERIZATION

Will not occur.

SECTION 11 :----- TOXICOLOGICAL INFORMATION -----

Acute effects: causes irritation. May be harmful if absorbed through the skin. causes eye irritation.

May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Harmful if swallowed.

LD₅₀ (orl-rat): 5620mg/kg

LD₅₀ (orl-mus): 4100mg/kg

SECTION 12 :----- Ecological information -----

N.A.

SECTION 13 :----- DISPOSAL CONSIDERATIONS -----

Burn in a chemical incinerator equipped with an afterburner and scrubber. But exert extra care in igniting as this material is highly flammable. Observe all federal, state and local environment regulations.

SECTION 14 :----- TRANSPORT INFORMATION -----

GGVE/GGVS/RID/ADR: 3/3b ; IMDG-code : 3.2/II UN 1173

SECTION 15 :----- REGULATORY INFORMATION -----

LABELLING ACCORDING TO EC DIRECTIVES

R:11-36-66-67: Highly flammable, irritating to eyes, repeated exposure may cause skin dryness or cracking.

Vapours may cause drowsiness and dizziness.

S:16-26-33: Keep away from source of ignition-no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Take precautionary measures against static discharges.

SECTION 16 :----- OTHER INFORMATION -----

N.A.

Information contained in this "Material Data Sheet" is believed to be reliable but no representation, guarantee or warranties of any kind are made as to its accuracy, suitability for a particular application, or results to be obtained from them. It is upto the manufacturer / seller / user to ensure that the information contained in the material safety data sheet is relevant to the product manufactured / handled or sold by him as the case may be. We make no warranties expressed or implied in respect of the adequacy of this document for any particular purpose.

MATERIAL SAFETY DATA SHEET

SECTION 1. - - - - - CHEMICAL IDENTIFICATION- - - - -

NAME: **ISOBUTYL METHYL KETONE**

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - -

CAS #: 108-10-1
M.W.: 100.1
EC NO: 203-550-1

SYNONYMS

ISOPROPYLACETONE , METHYL ISOBUTYL KETONE .

SECTION 3. - - - - - HAZARDS IDENTIFICATION - - - - -

LABEL PRECAUTIONARY STATEMENTS

FLAMMABLE (USA), HIGHLY FLAMMABLE (EU), IRRITANT

SECTION 4. - - - - - FIRST-AID MEASURES- - - - -

IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.

CALL A PHYSICIAN. IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL

RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF

WATER FOR AT LEAST 15 MINUTES.

SECTION 5. - - - - - FIRE FIGHTING MEASURES - - - - -

EXTINGUISHING MEDIA

CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.

SPECIAL FIREFIGHTING PROCEDURES

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.

FORMS EXPLOSIVE MIXTURES IN AIR.

SECTION 6. - - - - - ACCIDENTAL RELEASE MEASURES- - - - -

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. COVER WITH DRY-LIME, SAND, OR SODA ASH. PLACE IN COVERED CONTAINERS

USING NON-SPARKING TOOLS AND TRANSPORT OUTDOORS.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

EVACUATE AREA. SHUT OFF ALL SOURCES OF IGNITION.

SECTION 7. - - - - - HANDLING AND STORAGE- - - - -

KEEP CONTAINER CLOSED. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME. STORE IN A COOL DRY PLACE. HARMFUL LIQUID. IRRITANT.

SECTION 8. - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - -

SAFETY SHOWER AND EYE BATH. USE NONSPARKING TOOLS.

MECHANICAL EXHAUST REQUIRED. WASH THOROUGHLY AFTER HANDLING.

WASH CONTAMINATED CLOTHING BEFORE REUSE. AVOID BREATHING VAPOR.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID PROLONGED OR
REPEATED EXPOSURE.

NIOSH/MSHA-APPROVED RESPIRATOR. COMPATIBLE CHEMICAL-RESISTANT
GLOVES.

CHEMICAL SAFETY GOGGLES.

SECTION 9. - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - -

APPEARANCE AND ODOR

LIQUID.

PHYSICAL PROPERTIES

BOILING POINT: 115 - 117 C
MELTING POINT: -80 C
VAPOR PRESSURE: 15 MMHG @ 20 C
SOLUBILITY:
WATER -Z25047
SPECIFIC GRAVITY: 0,801
VAPOR DENSITY: 3,5 G/L

SECTION 10. - - - - - STABILITY AND REACTIVITY - - - - -

STABILITY

STABLE.

INCOMPATIBILITIES

OXIDIZING AGENTS, STRONG BASES

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

CARBON MONOXIDE, CARBON DIOXIDE

HAZARDOUS POLYMERIZATION

WILL NOT OCCUR.

SECTION 11. - - - - - TOXICOLOGICAL INFORMATION - - - - -

ACUTE EFFECTS

CAUSES SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.

CAUSES EYE IRRITATION. MAY BE HARMFUL IF INHALED.

MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY
TRACT.

ORL-RAT LD50:2080 MG/KG	UCDS** 4/25/1958
IPR-RAT LD50:400 MG/KG	38MKAJ 2C,4748,1982
ORL-MUS LD50:1900 MG/KG	NTIS** OTS0535383
IPR-MUS LD50:268 MG/KG	SCCUR* -,7,1961

SECTION 12. - - - - - ECOLOGICAL INFORMATION - - - - -

GGVE/GGVS/RID/ADR: 3/31C IMDG-CODE: 3.3/III UN 1993

SECTION 13. - - - - - DISPOSAL CONSIDERATIONS - - - - -

BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND
SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS
HIGHLY

FLAMMABLE.

OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - TRANSPORT INFORMATION - - - - -

GGVE/GGVS/RID/ADR: 3/31C IMDG-CODE: 3.3/III UN 1993

SECTION 15. - - - - - REGULATORY INFORMATION - - - - -

R 11

HIGHLY FLAMMABLE.

R 20

HARMFUL BY INHALATION.

R 36/37

IRRITATING TO EYES AND RESPIRATORY SYSTEM.

R 66

REPEATED EXPOSURE MAY CAUSE SKIN DRYNESS OR CRACKING.

S 9

KEEP CONTAINER IN A WELL-VENTILATED PLACE.

S 16

KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.

S 29

DO NOT EMPTY INTO DRAINS.

SECTION 16. - - - - - OTHER INFORMATION- - - - -

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