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NISSIN TECHNICAL DATA ON SOLBIN A

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1. CHARACTERISTICS

"SOLBIN A" is a thermoplastic resin consisting of polyvinyl chloride, polyvinyl alcohol and polyvinyl acetate. It has the following characteristics:

- 1) It is insoluble in alcohol, oil and aliphatic hydrocarbons, but is soluble in ketones, esters and chlorinated hydrocarbons. Aromatic hydrocarbons are diluent solvents.
- 2) Film made from "SOLBIN A" is tasteless and odorless and is unaffected at room temperature by alkalis, mineral acids, alcohol, oil and aliphatic hydrocarbons.
- 3) It combines high water resistance with low moisture permeability and low water absorption.
- 4) "SOLBIN A" offers superior mechanical properties such as anti-abrasion properties, flexibility and non-tackiness.
- 5) "SOLBIN A" imparts good, stable dispersibility to pigments and magnetic powder in these paints and in dried layers thereof, even at high packing density.
- 6) "SOLBIN A" provides wide choice for coating formulations because of a very good compatibility with various resins such as polyurethane, epoxy resins, NBR, isocyanate, etc.
- 7) Included in the hydroxy group, "SOLBIN A" reacts with organic radicals such as isocyanate to perform cross linking.

2. GENERAL PROPERTIES

Table 1. General Properties

Items	Test Results
Appearance	Slight yellow powder
Grain Size	Passes wholly through 28 mesh sieve
Bulk Density	about 0.7
Composition(%by weight)	
VC	91.5±1.5%
VAc	3.0±1.0%
VA	5.5±0.5%
Degree of Polymerization	420±30
Molecular weight Mn	3.0×10 ⁴
Glass transition temp.	76°C
Solution Viscosity	220±30mPa·s (MIBK/TOL. 20%, at 25°C)

3. SOLUBILITY

"SOLBIN A" is highly soluble in organic solvents such as ketones, esters and chlorinated hydrocarbons.

Table 2. Solubility of "SOLBIN A" with various Solvents.

Solvent	25°C	50°C	Solvent	25°C	50°C
Methanol	I	I	Tetrahydrofuran	S	S
isopropanol	I	I	Acetone	S	S
n-Butanol	I	I	MEK	S	S
Ethylene glycol	I	I	MIBK	S	S
Methyl acetate	I	S	Cyclohexanone	S	S
Ethyl acetate	PS	S	Ethylene dichloride	S	S
Butyl acetate	PS	S	Solvesso	SW	SW
DBP	S	S	Toluene	SW	SW
Dioxane	S	S	Xylene	SW	SW
isophorone	S	S	Aliphatic hydrocarbon	I	I

Note: S Soluble
 SC Soluble but turns cloudy
 PS Partially soluble
 SW Swells
 I Insoluble

Figure 1-2 show the viscosity of SOLBIN A solutions.

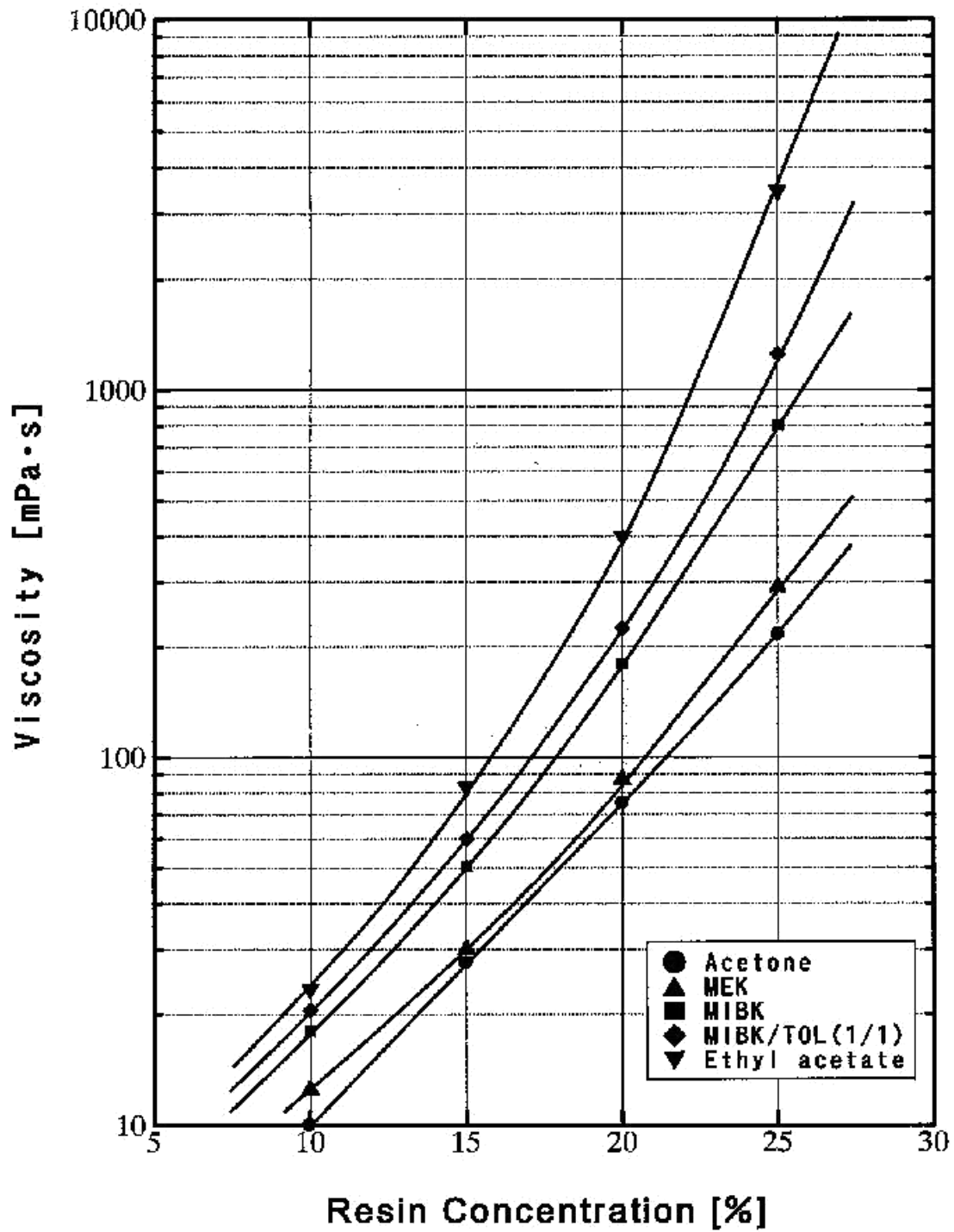


Fig.1 Viscosity of SOLBIN A solutions with various Solvents

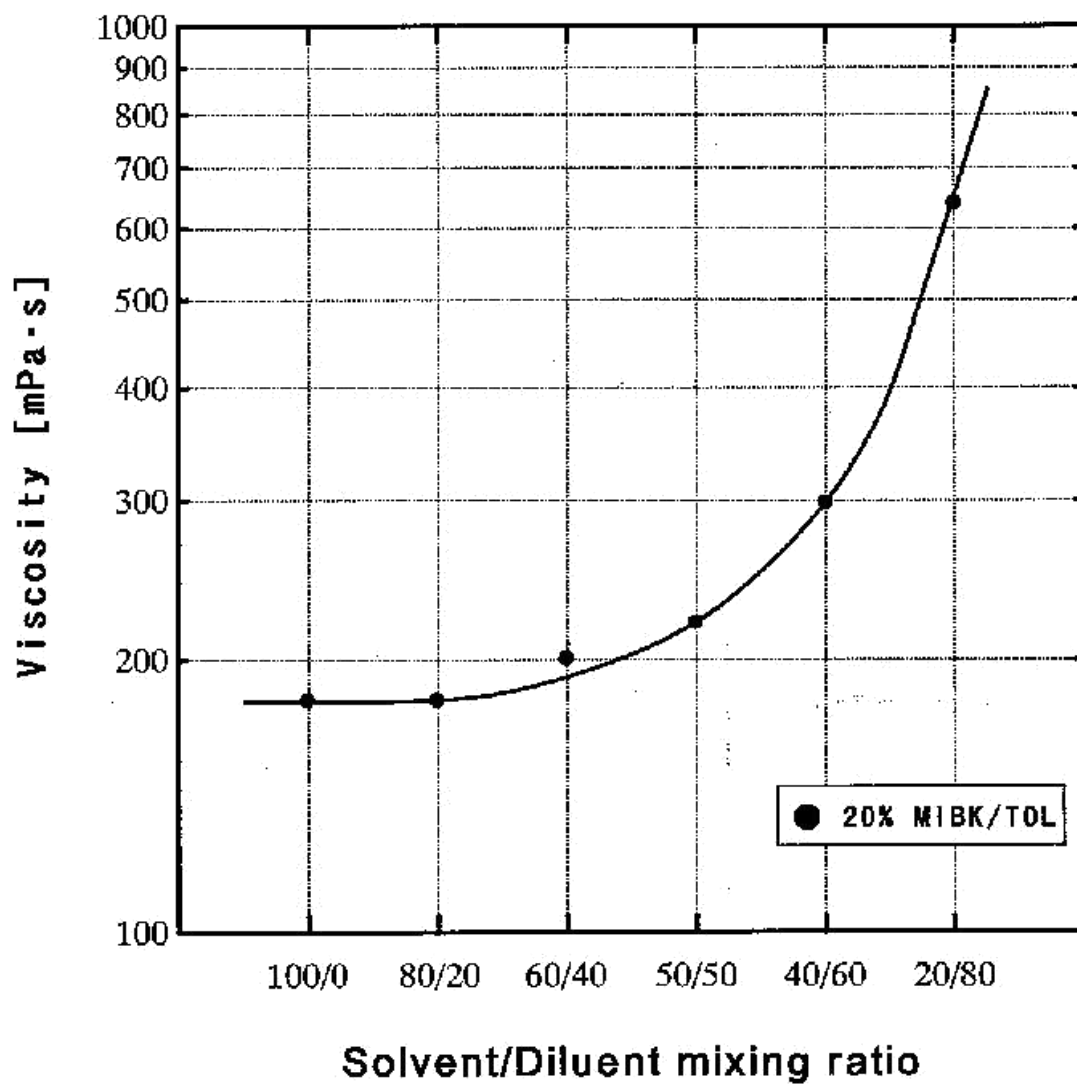


Fig.2 Viscosity of SOLBIN A solutions in MIBK/Toluene with various solvent ratio

4. Compatibility of SOLBIN A with Modifying Resins

Modifying Resins		"SOLBIN A"/Other			
		9/1	4/1	1/1	1/4
Alkyd	Beckosol 1307	○	○	○	○
	1334	○	○	○	×
	P-296	○	○	○	×
	1308	○	○	○	○
	1323	○	○	○	○
	P-786	○	○	×	×
	1303	○	○	○	○
	1341	○	○	○	△
Styrene -Alkyd	Styresol 4400	△	△	×	×
	4250		△		×
Melamine	Beckamine J-138	○	○	○	○
	Superbeckamine				
	J-820	○	○	○	×
	TD-126		○		×
	G-821		○		○
Epoxy	Epikote 828	○	○	○	○
	1001	○	○	△	×
Urethane	Nippolan 2006	○	○	○	○
	2301	○	○	○	○
	3004	○	○	○	○
	3022	○	○	○	○
	5032		△		×
	Coronate L		○		
	Kurisbon 4216		○		○

○ : Compatible
 △ : Partially incompatible
 × : Incompatible

5. APPLICATIONS

1) Magnetic paint

As "SOLBIN A" has excellent dispersing ability for inorganic pigments such as magnetic powder, it is used as a binder and dispersing agent for magnetic paint making magnetic finished products such as video tapes, audio tapes, magnetized cards and floppy disks.

2) Printing ink

"SOLBIN A" is used for coating and gravure printing ink, adding gloss for better decorative effect.

3) Metal Container Paints

It is used for lining food and beverage containers. Its anticorrosiveness makes it suitable as a lining for containers, including those for medicines and cosmetics. Because of its tough film, it is used for coating steel and galvanized tin plates that will be fabricated later.

4) Paper and Textile Coating

"SOLBIN A" provides waterproofness, adding gloss for better decorative effect.

6. How to use

"SOLBIN A" is usually dissolved in the mixed solvents of one part ketone, such as MEK and MIBK and one part aromatic hydrocarbon solvents, such as toluene and xylene, to make into a solution of 15-25% concentration by weight. For quicker drying, or in case of coating on a porous substances, such as paper and cloth, MEK and acetone are used.

For spray coating, MIBK is used. For baking on metals, ketone with a high boiling point such as cyclohexanone is used. For roll coating, cyclohexanone or isophorone are sometimes used.

Heating to around 50°C and sufficient agitation are required to speed up dissolving.

In order to provide proper flexibility, resilience and adhesiveness to film, 5-20 PHR of plasticizer are added. The kind and amount of plasticizer to be added can be determined in the same manner as in the method of blending polyvinyl chloride resins.

Most common pigments can be employed.

Stabilizers against heat and light are used, as with conventional polyvinyl chloride resins. The addition of about 0.2% propylene oxide, in this case, can prevent the corrosion of containers and change in paints in storage.

Any method of coating, including spraying, roll coating and others, may be used. For roll coating, a solution of 200-400 seconds in Ford Cup No.4 viscosity should be used. For spray coating, a solution of 60-80 seconds in Ford Cup No.4 viscosity should be used at an air pressure of 98-100 psi and a liquid pressure of 20-30 psi.

"SOLBIN A" is not usually able to give satisfactory adhesion through air drying alone. The following are the degrees of adhesion to various surfaces by air drying:

Excellent: Polyvinyl chloride resin, Acryl resin
Good : Concrete, Plaster
Fair : Chlorinated rubber
Inferior : Metal, Wood, Paper, Cloth, Phenol resin, Alkyd resin,
Butyral resin, Celluloid, Shellac, Dried waterborn or
oil paints

Short-time baking at 170-190°C will significantly improve adhesion and surface gloss. When primers are used, sufficient adhesion may be obtained without baking.