



Escoat® P-20 Solids Release Coat

Introduction:

Escoat® P-20 Solids is a non-silicone product especially produced and widely used for pressure sensitive labels, film and tapes. Its high degree of purity, quality and tight melting point range offers superior properties and performance to critical users. Escoat® P-20 Solids is used on films with adhesives based on natural rubber, SBR, SIS, acrylic, etc. primarily for obtaining release in self wound tapes where tight peel is mandatory. Escoat® P-20 Solids is expected to give a peel strength 2-3 times the level expected from most silicone release agents. In addition, the non-stick properties of the Escoat® P-20 Solids resin find use in a wide range of applications outside the pressure sensitive area.

Material Description:

Carbamate Release Coat

Chemical Name:

Polyvinyl Octadecyl Carbamate

Empirical Formula:

$[\text{CH}_2\text{-CH}(\text{OCONHC}_{18}\text{H}_{37})\text{-}]_n$

CAS#:

36671-85-9

Molecular Weight:

$[339]_n$ or > 60,000

Physical Properties:

Appearance:	white to amber colored, dry powder
Melting Range:	97 - 107°C
Assay:	99.5% minimum
Clarity, ADSAM082, Heated to 70 °C:	Clear (10 g/100ml of toluene)
Color, ADSAM121, Gardner:	<5
Solubility in Water:	Insoluble

Characteristics:

At a solids level of approximately 10% , Escoat® P-20 Solids generally forms a reversible gel on standing. The stiffness of the gel depends upon the temperature and the concentration of the non-volatile materials present. The reversible gel may be dissolved back into the solution with very moderate temperature increases. Due to unknown flammability hazards of toluene and other solvents every precaution should be taken to prevent the consequences of incorrect handling.

Homogeneous solutions are also obtained with other aromatic and aliphatic hydrocarbons, chlorinated solvents, and esters. Polar solvents, such as alcohols, should be avoided, as they tend to cause precipitation. To avoid inconvenience of gel formation during coating operation, levels of 1% solids or less are recommended provided suitable coating techniques are available to give uniform consistent coating.

Solubility:

Escoat® P-20 Solids is only sparingly soluble in aliphatic and aromatic solvents with toluene being preferred. Polar solvents such as alcohol, if added in excess (10-20%) to toluene solution, will precipitate the polymer. Moderate amounts of alcohol, 2-5% on 100% toluene, are however, beneficial in reducing static problems. Warm solutions of toluene and most aromatics and aliphatics at a level of 1% solids, should be clear and coatable. Make sure all solvents have been removed before the release coat comes into contact with the adhesive.

Solubility in various solvents follows:

<u>Solvent</u>	<u>At 25 °C</u>	<u>At 50°C</u>
Chloroform	Yes	Yes
Trichloroethane	Yes	Yes
Tetrachloroethane	No	Yes
1,2-Dichloroethane	No	Yes
Benzene	Yes	Yes
Toluene	Yes	Yes
Xylene	Yes	Yes
Cyclohexane	No	Slightly
THF	Slightly	Yes
1,4-Dioxane	No	Yes
DMSO	No	No
MEK	No	Slightly
Ethyl Acetate	No	No
Isopropyl Alcohol	No	No
Sec-Butyl Alcohol	No	Slightly

Mixing Instructions:

Depending on type of tape film and type of pressure sensitive adhesive, the concentration of solid matter is determined by pre-testing. If a 0.5% weight solution is required, add 500 grams of Escoat® P-20 Solids to 2 kgs. of toluene. Raise temperature to 122 - 144°F with constant stirring until it becomes clear. Then add this solution to 97.5 kgs. of toluene.

Mixing time at 10% solids in toluene at 122 - 144°F requires about 20 - 30 minutes. It takes 2 – 3 hours to dissolve Escoat® P-20 Solids at 10% solids in toluene at 120°F.

Applications:

Escoat® P-20 Solids provides good release properties and prevents delamination or tearing when applied to the backing on the side opposite the adhesive. It has been extensively tested and is widely approved for use with pressure sensitive tapes such as polypropylene, polyester, polyethylene, cellophane, duct tapes and other substrates that require unwinding ease. May also be used for foil and paper. When Escoat® P-20 Solids is used as a release coat on paper, a barrier coat is recommended. Escoat® P-20 Solids is particularly useful to give light release on so-called “easy peel” acrylics.

Good release properties can be obtained using as little as a 0.5 – 2.0% solids material in toluene and a very fine gravure roller. A smoothing bar after application is recommended. It is essential to keep the gravure roller clean at these low levels of application to ensure consistent application. Laboratory evaluations can be made with Meyer rods or other simple application methods where a consistent near monomolecular layer of Escoat® P-20 can be put down.

Advantages:

- The narrow melting point range ($\pm 5^{\circ}\text{C}$) assures consistent release properties.
- Release effects remain stable after oven aging.
- Cost efficient. Requires a lower quantity than silicone release coatings. 0.01 to 1.0 grams of Escoat® P-20 Solids for one square meter of film is sufficient. Excellent release can be obtained using between 0.5 - 2.0% solids material in toluene, depending on film, coating equipment and desired release levels. Only needs a near-monomolecular film.
- 100% dry powder.
- No fire hazard or special red-label storage area required for Escoat® P-20 Solids dry powder.
- One step dilution process. Properly diluted solution will not gel.
- Does not require high temperature processing that is typically needed for silicone coatings.

- Packaging:** Escoat® P-20 Solids is available in a 5 gallon (22 lb.) pail and in a 30 gallon (110-lb.) fiber drum, net weight, with inner liner.
- Storage:** This product may be stored up to two years in sealed containers. Containers should be stored in cool, dry areas. Extended storage at elevated temperatures or exposure to direct heat could reduce product shelf life. Keep containers sealed when not in use and during transport.
- Toxicity & Safety:** This material is not intended for use in products for which prolonged contact with mucous membranes or abraded skin, or implantation within the human body is specially intended, unless the finished product has been tested in accordance with the Food and Drug Administration and/or other applicable safety testing requirements. Because of wide range of such potential uses, Mayzo, Inc. is not able to recommend this material as safe and effective for such uses and assumes no liability for any such uses. Read and understand the Material Safety Data Sheet before using or handling this product.
- FDA Regulations:** Escoat® P-20 Solids (CAS # 36671-85-9) has been tested and approved for clearance for use in food contact applications. Contact your Mayzo representative if more details of this approval are needed.

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