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Appendix I.
Material Specificati

PS 125

General Purpose Polystyrene

Characteristics

General purpose polystyrene PS 125 is manufactured by continuous mass polymerization of styrene monomer. It is a crystal-like, hard and brittle polymer.

- Medium flow with excellent clarity.
- Higher Vicat and heat distortion temperatures allow its use in many different applications.

Applications

- It is recommended for the manufacture of a variety of packaging items, namely jewelry and gift boxes; medical supplies such as petri dishes, test tubes and specimen jars, etc.
- Another important use is in capping the high impact polystyrene coextruded sheet for high surface gloss.
- It could be blended with impact modifier resin for clear packaging articles.

Typical Properties ^a	Unit	Value ^b	ASTM Method
MELT INDEX (200°C, 5 KG)	g/10 min.	7.0	D-1238
DENSITY (23°C)	g/cm ³	1.05	D-792
BULK DENSITY (METHOD B)	g/cm ³	0.60	D-1895
VICAT SOFTENING POINT (Rate A, 1 Kg/50°C)	°C	95	D-1525
HEAT DISTORTION (METHOD B, 455 KPA), ANNEALED	°C	90	D-648
ULTIMATE TENSILE STRENGTH (5mm/min)	(MPa)	43	D-638
ULTIMATE TENSILE ELONGATION	%	2	D-638
TENSILE MODULUS	(MPa)	2598	D-638
FLEXURAL STRENGTH	(MPa)	82	D-790

431

261

81

Appendix II

Material Specification of HIPS

Typical Properties:	Unit	Value	ASTM Method
MELT INDEX (200°C, 5 KG)	g/10 min.	3.0	D-1238
DENSITY (23°C)	g/cm ³	1.04	D-792
BULK DENSITY (METHOD B)	g/cm ³	0.60	D-1895
VICAT SOFTENING POINT (Rate A, 1 Kg/50°C)	°C	99	D-1525
HEAT DISTORTION (METHOD B, 455 KPA), ANNEALED	°C	97	D-648
ULTIMATE TENSILE STRENGTH (5mm/min)	(MPa)	29	D-638
ULTIMATE TENSILE ELONGATION	%	50	D-638
TENSILE MODULUS	(MPa)	2353	D-638
FLEXURAL STRENGTH	(MPa)	44	D-790
FLEXURAL MODULUS	(MPa)	2353	D-790

Characteristics

High impact polystyrene PS 330 is manufactured by continuous mass polymerization of styrene monomer.

An elastomer is incorporated during polymerization to achieve impact resistance property. It is generally opaque in color.

- High impact strength polystyrene with high heat distortion temperature and good physical properties.

Applications

- It is primarily designed for extrusion and thermoforming applications.
- It can be used for food packaging and dairy products.

Appendix III.

PRODUCT INFORMATION AND DATA SHEET

PRODUCTION NAME: FILLER MASTERBATCH
PRODUCT GRADE: EFPE 80

About Product

This product is one of kinds filler masterbatch. It is manufactured by twin crew extruder machine a most modern technology represented in Vietnam.

General Description

This product contains: CaCO₃, resin and some additives. It's suitable for extrusion, blowing threading yarn, injection molding, etc. This product has very good dispersion, free of agglomeration bring for the end product more whiteness, transparent, glossier, smooth's surface.

Technical Analysis

Physical Property

Items	Method of experiment	Unit	Standard
Calcium Carbonate (CaCO ₃) content	ASTM D 5630	wt %	80
Melt Mass-Flow Rate (190°C/5kgs)	ASTM D 1238	g/10 mins	23
Melt Temperature	DSC	°C	110
Bulk density	ASTM D1895	g/cm ³	1.15
Particle size of CaCO ₃ Powder	Malvern	µm	3
Water Content	ASTM D 644	wt %	<0.15

Properties:

Appearance (Surface color)	: White
Additives	: Dispersion agent, processing aid
Processing temperature	: 140 – 280°C
Usage rate	: 5 -40 %
Pellet size	: 3x3 (±0.3) mm
Carrier resin	: LLDPE
Compatibility	: LLDPE, LDPE, HDPE, PP, PS..
Packing	: 25 kgs/bag
Storage	: Keep at dry condition

Caution:

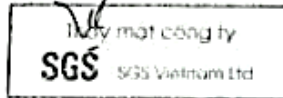
EUROPEAN PLASTIC JOINT STOCK COMPANY
DONG VAN INDUSTRIAL ZONE, DUY TIEN DISTRICT, HANAM PROVINCE
VIETNAM

The following sample was submitted and identified on behalf of the client as below:

Sample : EFPE 80
Characteristic : WHITE FILM
Country of Destination : NA
Sample Receiving Date : March 27, 2015
Testing Period : March 27, 2015 to April 15, 2015
Test Requested : Please refer to the result summary.
Test Method & Results : Please refer to next page(s).
Result Summary :

Test Requested	Conclu
Commission Regulation (EU) No 10/2011 and hence Article 3 of European Regulation No. 1935/2004.	
a) Plastic – Overall Migration	PAS
b) Plastic – Specific Migration of Heavy Metals	PAS

Signed for and on behalf of
SGS Vietnam LTD



Tran Thi Lien
Hardline and E&E Lab Manager

Test Results:
Sample Description: 1. EFPE 80

a) Overall migration

Method: With reference to Commission Regulation (EU) No 10/2011 of 14 January 2011 Annex III and Annex V for selection of condition and EN 1186-1:2002 for selection of test methods; EN 1186-3:2002 aqueous food simulants by total immersion method.

Simulant Used	Test Condition	Result (mg/dm ²)	Reporting Limit (mg/dm ²)	Permissible Limit (mg/dm ²)
		1		
50% Ethanol (V/V) Aqueous Solution	10 days at 40°C	ND	3	10
3% Acetic Acid (W/V) Aqueous Solution	10 days at 40°C	4.45	3	10
Deionized Water	10 days at 40°C	ND	3	10
Comment	--	PASS	--	--

Note : 1. mg/dm² = milligram per square decimeter

2. °C = degree Celsius

3. ND = Not Detected

4. Permissible Limit is according to Commission Regulation (EU) No 10/2011 of 14 January 2011 with amendments.

b) Specific Migration of Heavy Metals

Method: With reference to Commission Regulation (EU) No 10/2011 of 14 January 2011 Annex III and Annex V for selection of condition and EN 13130-1:2004 for selection of test method. Analysis was performed by ICP-MS.

Simulant Used: 3% acetic acid (w/v) in aqueous solution

Test Condition: 40°C for 10days

Test Item	Result (mg/kg)	Reporting Limit (mg/kg)	Permissible Limit (mg/kg)
	1		
Specific Migration of Barium	ND	0.25	1
Specific Migration of Cobalt	ND	0.01	0.05
Specific Migration of Copper	ND	0.5	5
Specific Migration of Iron	ND	0.5	48
Specific Migration of Lithium	ND	0.5	0.6
Specific Migration of Manganese	ND	0.25	0.6
Specific Migration of Zinc	ND	0.25	25
Comment	PASS	--	--

Note : 1. mg/kg = milligram per kilogram of foodstuff in contact with

2. °C = degree Celsius

3. ND = Not Detected

4. Permissible Limit is according to Commission Regulation (EU) No 10/2011 of 14 January 2011 with amendments.

5. Test condition & simulant were specified by client.

Remark: These tests were performed by SGS Vietnam's Chemical lab.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only. This document cannot be reproduced except in full, without prior approval of the company.

Appendix IV

Material Specification of WMB



SPECIFICATION

Name: White Masterbatch

Grade: VC – W 30S

About product

VC –W 30S is a poly propylene based mastebatch containing highly dispersive TiO₂ Rutile which is recommended for PS thermoforming. It ensure better dispersion and .

Physical Properties

Index	Test method	Unit	Typical Value
Carrier	---	---	PE + coupling agent
TiO ₂ content	---	%wt	30
MI @2.16kg/230°C	ASTM D1238	g/10 mins	11 ± 1
Moisture	ASTM D644	%	0.10 max
Shape	----	granule	2~3 mm ^φ

Additives : Dispersion agent, processing aid

Processing temperature : 150 – 330°C

Uses percent : 2- 8 %

Compatibility : PE, PS

Packing : 25 kg/bag

Storage : Keep at dry condition

Medical norm

Attain the Safety Norm for Health and Foodstuff issued by Vietnam Directorate for Standards and Quality allow the decision 3339/2001/QĐ-BYT promulgated by Vietnam Ministry of Health.

Safety apply for handling process. No healthy damage infected.

Caution: This product information is based on our general experience and does not constitute a specification. Since many factors affect the use of our products, no warranty is given or implied with respect to this information or patent infringement. We do not accept liability for any loss or damage arising from the use of this information. All sales are subject to our Standard Terms and Conditions of Sale.

QC Department

Appendix V

Material Specification of Polypropylene

HC205TF

DESCRIPTION

HC205TF is Homopolymer grade produced by the proprietary **Borstar®** process, intended for sheet and thermoformed packaging applications.

This grade is produced using the **Borealis Nucleation Technology™ (BNT)**. Its increased crystallisation temperature allows reduced cycle time and increased output. Products originating from this grade have excellent transparency, good organoleptic properties, good balance of stiffness and impact strength at ambient temperatures.

APPLICATIONS

In-line & Off line thermoforming

High transparency trays, cups and containers

Margarine tubs and dairy containers

Blending with copolymers for lids

SPECIAL FEATURES

Good stiffness-impact balance

Excellent processability

Excellent clarity

Broad application window

Consistent shrinkage (post forming)

Excellent product consistency

Reduced cycle time / higher output

PHYSICAL PROPERTIES

Property	Typical Value	Test Method
Density	900 -910 kg/m ³	ISO 1183
Melt Flow Rate (230 °C/2.16 kg)	4 g/10min	ISO 1133
Flexural Modulus (5 mm/min)	1700 MPa	ISO 178
Tensile Modulus (1 mm/min)	1750 MPa	ISO 527-2
Tensile Strain at Yield (50 mm/min)	8 %	ISO 527-2
Tensile Stress at Yield (50 mm/min)	35.5 MPa	ISO 527-2
Melting Temperature (DSC)	164 - 168 °C	ISO 3146
Heat Deflection Temperature (0.45 MPa)	106 °C	ISO 75-2
Charpy Impact Strength, notched (23°C) ¹	5 kJ/m ²	ISO 179/1eA

¹Data should not be used for specification work

¹ Measured on injection moulded specimens according to ISO 1873-2

Appendix VI

Extruder Machine Specification

PURPOSE AND SPECIFICATIONS:
SHEET EXTRUDER, 1000mm SHEET WIDTH, 700-800kg/hr for PS
Including metering gear pump for primary Extruder, Nordson-USA

I. Machine Specifications

- 1) Material:
- | | |
|---------------|--|
| Main Extruder | PS / PP (Thermoforming Grade) |
| Sub Extruder | PS / PP Pellet/Flakes |
| Layers: | PS / PP Pellet/Flakes |
| Thickness: | Two Layers |
| Sheet Width: | 0.15 mm to 2.0mm (Thickness variation around \pm 20microns) |
| Sheet output: | 1000mm finish on winder (After Trim) |
| | 700 kg/hr PS (130mmØ Extruder with 50% flakes and 50% virgin) |
| | 65kg/hr PS (70mmØ Extruder with 50% flakes and 50% virgin) |
| | (at 70% regrind, output rates will decrease by a maximum 20%) |
| | (at 100% regrind, output rates will decrease by a maximum 40%) |

Sheet Thickness (microns)	Output (kg/hour)
150 – 200	350 – 450
250 – 300	450 – 500
350 – 350	450 – 500
400 – 450	500 – 550
500 – 550	550 – 650
600 – 650	650 – 700

- 2) Line Speed 5m-60m/min
- 3) Machine Color
- | | |
|---------------|----------------|
| Main Body | (White B48880) |
| Safety Cover | (NS/V Blue) |
| Control Panel | (NS/V Blue) |
| Heat Cover | Black |
| Electric Duct | Orange |

II. Machine Parts

- 1) Main Extruder
- | | |
|------------------------|-------------------------------|
| (a) Main Driving Motor | 200kw x 4P, AC Inverter Motor |
| (b) Power Transmittal | V-Belt (5V) |
| (c) Hopper | |

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