PC-ABS (polycarbonate-ABS) is one of the most widely used industrial thermoplastics. PC-ABS offers the most desirable properties of both materials – the superior strength and heat resistance of PC and the flexibility of ABS. PC-ABS blends are commonly used in automotive, electronics and telecommunications applications. Additionally, a PC-ABS part manufactured on a Fortus® or Stratasys F370™ 3D Printer is 5-60 percent stronger than a part made on previous FDM® systems. PC-ABS gives you conceptual modeling, functional prototyping, manufacturing tools and production parts.

### MECHANICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength (Type 1, 0.125”, 0.2”/min)</td>
<td>ASTM D638</td>
<td>5,900 psi</td>
<td>41 MPa</td>
</tr>
<tr>
<td>Tensile Modulus (Type 1, 0.125”, 0.2”/min)</td>
<td>ASTM D638</td>
<td>278,000 psi</td>
<td>1,900 MPa</td>
</tr>
<tr>
<td>Tensile Elongation (Type 1, 0.125”, 0.2”/min)</td>
<td>ASTM D638</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Flexural Strength (Method 1, 0.05”/min)</td>
<td>ASTM D790</td>
<td>9,800 psi</td>
<td>68 MPa</td>
</tr>
<tr>
<td>Flexural Modulus (Method 1, 0.05”/min)</td>
<td>ASTM D790</td>
<td>280,000 psi</td>
<td>1,900 MPa</td>
</tr>
<tr>
<td>IZOD Impact, notched (Method A, 23°C)</td>
<td>ASTM D256</td>
<td>3.7 ft-lb/in</td>
<td>196 J/m</td>
</tr>
<tr>
<td>IZOD Impact, un-notched (Method A, 23°C)</td>
<td>ASTM D256</td>
<td>9 ft-lb/in</td>
<td>481 J/m</td>
</tr>
</tbody>
</table>

### THERMAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Deflection (HDT) @ 66 psi</td>
<td>ASTM D648</td>
<td>230°F</td>
<td>110°C</td>
</tr>
<tr>
<td>Heat Deflection (HDT) @ 264 psi</td>
<td>ASTM D648</td>
<td>205°F</td>
<td>96°C</td>
</tr>
<tr>
<td>Vicat Softening Temperature</td>
<td>ASTM D1525</td>
<td>234°F</td>
<td>112°C</td>
</tr>
<tr>
<td>Glass Transition Temperature (Tg)</td>
<td>DMA (SSYS)</td>
<td>257°F</td>
<td>125°C</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>- - - - - - - - -</td>
<td>4.10 x 10^-5 in/in/°F</td>
<td>- - - -</td>
</tr>
<tr>
<td>Melt Point</td>
<td>- - - - - -</td>
<td>Not Applicable³</td>
<td>Not Applicable³</td>
</tr>
</tbody>
</table>

### ELECTRICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Value Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Resistivity</td>
<td>ASTM D257</td>
<td>2.0x10^14 - 4.4x10^13 ohm-cm</td>
</tr>
<tr>
<td>Dielectric Constant</td>
<td>ASTM D150-98</td>
<td>2.9 - 2.7</td>
</tr>
<tr>
<td>Dissipation Factor</td>
<td>ASTM D150-98</td>
<td>.0035 - .0032</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>ASTM D149-09, Method A</td>
<td>340 - 90 V/mil</td>
</tr>
</tbody>
</table>
PC-ABS
PRODUCTION-GRADE THERMOPLASTIC FOR
FDM 3D PRINTERS

At the core:
Advanced FDM Technology™
Fortus systems are based on patented Stratasys FDM (Fused Deposition Modeling) technology. FDM is the industry’s leading additive manufacturing technology, and the only one that uses production-grade thermoplastics, enabling the most durable parts.

Fortus systems use a wide range of thermoplastics with advanced mechanical properties so your parts can endure high heat, caustic chemicals, sterilization and high impact applications.

No special facilities needed
You can install a Fortus 3D Printer or Stratasys F123 Series 3D Printer just about anywhere. No special venting is required because they don’t produce noxious fumes, chemicals or waste.

No special skills needed
Fortus 3D Printers and Stratasys F123 Series 3D Printers are easy to operate and maintain compared to other additive fabrication systems because there are no messy powders or resins to handle and contain. They’re so simple, an operator can be trained to operate one in less than 30 minutes.

Get your benchmark on the future of manufacturing
Fine details. Smooth surface finishes. Accuracy. Strength. The best way to see the advantages of a Fortus 3D Printer or Stratasys F123 Series 3D Printer is to have your own part built on one. Get your free part online at stratasys.com.

OTHER

<table>
<thead>
<tr>
<th>TEST METHOD</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity</td>
<td>ASTM D792</td>
</tr>
<tr>
<td>Density</td>
<td>ASTM D792</td>
</tr>
<tr>
<td>Flame Classification</td>
<td>UL94</td>
</tr>
<tr>
<td>Rockwell Hardness</td>
<td>ASTM D785</td>
</tr>
</tbody>
</table>

SYSTEM AVAILABILITY

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>LAYER THICKNESS</th>
<th>SUPPORT</th>
<th>AVAILABLE COLORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortus 360mc</td>
<td>0.013 inch (0.330 mm)</td>
<td>Soluble Supports</td>
<td>Black</td>
</tr>
<tr>
<td>Fortus 380mc</td>
<td>0.010 inch (0.254 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fortus 400mc</td>
<td>0.007 inch (0.178 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fortus 450mc</td>
<td>0.005 inch (0.127 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fortus 900mc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stratasys F370</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, test conditions, etc. Actual values will vary with build conditions. Tested parts were built on Fortus 400mc @ 0.010” (0.254 mm) slice. Product specifications are subject to change without notice.

The performance characteristics of these materials may vary according to application, operating conditions, or end-use. Each user is responsible for determining that the Stratasys material is safe, lawful, and technically suitable for the intended application, as well as for identifying the proper disposal (or recycling) method consistent with applicable environmental laws and regulations. Stratasys makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use, or warranty against patent infringement.

1 Build orientation is on side long edge.

2 Literature value unless otherwise noted.

3 Due to amorphous nature, material does not display a melting point.

4 All Electrical Property values were generated from the average of test plaques built with default part density (solid). Test plaques were 4.0 x 4.0 x 0.1 inches (102 x 102 x 2.5 mm) and were built both in the flat and vertical orientation. The range of values is mostly the result of the difference in properties of test plaques built in the flat vs. vertical orientation.

5 0.005 inch (0.127 mm) layer thickness not available for Fortus 900mc.
1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

GHS product identifier

Product Name        PC-ABS Model Material

Other means of identification

SSYS Part Number    400630-0001
Synonyms            Polycarbonate ABS Alloy

Recommended use of the chemical and restrictions on use

Recommended Use     Additive manufacturing
Uses advised against No information available

Supplier's details

Supplier Address    Stratasys Inc
                    7665 Commerce Way
                    Eden Prairie, MN
                    55344
                    TEL: 1(952) 937 3000

Emergency telephone number

Emergency Telephone 1(952) 937 3000
Number               +49 722 97772281 - Global - English language response
                    +1 978 495 5580 - USA - Multi lingual response

2. HAZARDS IDENTIFICATION

Classification

This chemical is not considered hazardous according to the OSHA Hazard Communication Standard 2012 (29 CFR 1910.1200).

GHS Label elements, including precautionary statements

Emergency Overview

Signal Word          None

The product contains no substances which at their given concentration are considered to be hazardous to health
Appearance          Black.
Physical State      Solid (compressed).
Odor               None.

Precautionary Statements

Prevention
• None
General Advice
• None

Storage
• None

Disposal
• None

Hazard Not Otherwise Classified (HNOC)
Not applicable.

Other information
100% of the mixture consists of ingredient(s) of unknown toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS
The product contains no substances which at their given concentration, are considered to be hazardous to health.

Synonyms
Polycarbonate ABS Alloy

4. FIRST AID MEASURES

Description of necessary first-aid measures

Eye Contact
Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.

Skin Contact
Wash off with water. If molten polymer contacts the skin, cool rapidly with cold water. Do not attempt to peel cured polymer from skin. Removal of solidified molten material from skin requires medical assistance.

Inhalation
Move to fresh air. If symptoms persist, call a physician.

Ingestion
Drink plenty of water. Do NOT induce vomiting. If symptoms persist, call a physician.

Most important symptoms/effects, acute and delayed
No information available.

Indication of immediate medical attention and special treatment needed, if necessary
Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Unsuitable Extinguishing Media
No information available.

Specific Hazards Arising from the Chemical
Burning produces obnoxious and toxic fumes. Carbon monoxide. Carbon dioxide (CO2). Hydrogen cyanide. Styrene

Explosion Data
Sensitivity to Mechanical Impact
None.
Sensitivity to Static Discharge
None.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions

Environmental Precautions
Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up
Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Wear personal protective equipment. Ensure adequate ventilation. Prevent contact with molten product. Do not eat, drink or smoke when using this product. Do not take internally. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage
Keep tightly closed in a dry and cool place.

Incompatible Products
Strong oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Exposure Guidelines
This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering Measures
Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection
Safety glasses with side-shields. For handling molten material, use of a faceshield is recommended.

Skin and Body Protection
When handling hot material, use heat resistant gloves.

Respiratory Protection
No protective equipment is needed under normal use conditions.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES
### 10. STABILITY AND REACTIVITY

#### Reactivity
No data available.

#### Chemical stability
Stable under recommended storage conditions.

#### Possibility of hazardous reactions
None under normal processing.

#### Hazardous Polymerization
Hazardous polymerization does not occur.

#### Conditions to avoid
Incompatible products.

#### Incompatible materials
Strong oxidizing agents.
Hazardous decomposition products

Carbon oxides. Hydrogen cyanide. Styrene

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

<table>
<thead>
<tr>
<th>Route</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Exposure to volatiles released during hot processing may cause respiratory</td>
</tr>
<tr>
<td></td>
<td>tract irritation.</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>Contact with eyes may cause irritation.</td>
</tr>
<tr>
<td>Skin Contact</td>
<td>Contact with molten material will cause thermal burns.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Not an expected route of exposure. Ingestion may cause stomach discomfort.</td>
</tr>
</tbody>
</table>

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information</td>
<td>available.</td>
</tr>
</tbody>
</table>

Delayed and immediate effects and also chronic effects from short and long term exposure

<table>
<thead>
<tr>
<th>Effect</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitization</td>
<td>No information available.</td>
</tr>
<tr>
<td>Mutagenic Effects</td>
<td>No information available.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Contains no ingredients above reportable quantities listed as a carcinogen.</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>No information available.</td>
</tr>
<tr>
<td>STOT - single exposure</td>
<td>No information available.</td>
</tr>
<tr>
<td>STOT - repeated exposure</td>
<td>No information available.</td>
</tr>
<tr>
<td>Target Organ Effects</td>
<td>Eyes. Skin.</td>
</tr>
<tr>
<td>Aspiration Hazard</td>
<td>No information available.</td>
</tr>
</tbody>
</table>

Numerical measures of toxicity - Product

Acute Toxicity

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>of the mixture consists of ingredient(s) of unknown toxicity.</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Ecotoxicity

| Substances known to be hazardous to the environment or not degradable in waste water treatment plants |

Persistence and Degradability

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available.</td>
</tr>
</tbody>
</table>

Bioaccumulation

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available.</td>
</tr>
</tbody>
</table>

Other Adverse Effects

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available.</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispose of in accordance with federal, state,</td>
</tr>
<tr>
<td>and local regulations.</td>
</tr>
</tbody>
</table>

Contaminated Packaging

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not re-use empty containers.</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION
15. REGULATORY INFORMATION

International Inventories
TSCA  Complies
DSL  Complies

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
- Acute Health Hazard  No
- Chronic Health Hazard  No
- Fire Hazard  No
- Sudden Release of Pressure Hazard  No
- Reactive Hazard  No

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated by state right-to-know regulations.

U.S. EPA Label Information
EPA Pesticide Registration Number  Not applicable

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical and Chemical Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health Hazard</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Physical Hazard</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health Hazard</td>
<td>1</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>
Prepared By
Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

Issuing Date
20-Nov-2015

Revision Date
20-Nov-2015

Revision Note
Initial Release.

General Disclaimer
The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet