





***DENSO***

**SoC Reporting Guide**

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# DENSO SoC Reporting Guide

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## Overview

OEMs mandate that suppliers report recycled content, recyclability, and restricted and reportable substance content in parts shipped to them for the purpose of dismantling, recycling and substance certification. DENSO, as a Tier I supplier, is required to cascade these reporting requirements to sub-tier suppliers and coordinate the reporting of this requested data to the OEMs.

To facilitate these various customer-reporting requirements, DENSO requires that suppliers utilize the International Material Data System (IMDS) to report this information.

This document identifies DENSO's minimum reporting requirements and provides instructions for completing the IMDS Material Data Sheets (MDS).

## DENSO Reporting Requirements

DENSO suppliers are required to utilize IMDS to report part, material, and substance information for:

1. Parts or materials used in current production – DENSO will provide suppliers with a written request identifying applicable DENSO part numbers or material names and reporting due date.
2. New Product Initial sample submissions (PPAP/ISIR) – Effective 12-31-03, DENSO suppliers are required to submit SoC data for all PPAP/ISIR parts.
3. Production part modifications – Prior to production part modifications when there is a change to the part's material content, substance composition or change in the mass of a part exceeding the tolerance listed on the production part drawing.

## Technical Support

For questions regarding DENSO's SoC reporting requirements, please contact the DENSO SoC Help Desk at 248-372-8454 or send an e-mail to: [EAD\\_SoC@denso-diam.com](mailto:EAD_SoC@denso-diam.com).

For IMDS technical assistance, contact the IMDS Service Center Monday through Friday, 8 a.m. to 5 p.m. (CST) at 972-403-3607 or send an e-mail to [imds-eds-helpdesk-nao@eds.com](mailto:imds-eds-helpdesk-nao@eds.com)

## Reporting Part, Material, and Substance Overview

SoC data reporting requires knowledge of your bill of material (BoM) and how your parts are assembled. Suppliers must provide the component structure for assemblies and subassemblies down to bottom level parts. Bottom level parts are then defined by their materials of composition, and materials are defined by their chemical composition (i.e. substances).

To complete an IMDS MDS, you will need to collect all the data listed below. Consult with other departments and sub-tier suppliers to determine the following:

- Part structure (bill of material) for the final product shipped to DENSO
- Internal part numbers (and sub-component part numbers, if applicable);
- Part weights (and sub-component part weights, if applicable);
- Materials and quantity of each material used in bottom-level parts;
- Chemical composition of the material (CAS# and chemical names); and
- The percentage of pre-consumer and post-consumer material contained within the materials.

***Important Note:*** It is the responsibility of DENSO direct suppliers to coordinate the investigation of sub-tier suppliers and consolidate the reporting results on a single IMDS MDS under the part number supplied to DENSO. DENSO will **not** coordinate the collection of sub-tier supplier data.

## **DENSO IMDS Reporting Requirements**

This section provides DENSO specific IMDS reporting requirements. This section supplements the Recommendations and Help pages, available within IMDS, with DENSO requirements for IMDS data fields.

Adhere to IMDS Recommendation IMDS 001, available for download from the IMDS Recommendations page, for proper component structure.

### **IMDS Access**

Access IMDS via the internet at [www.mdssystem.com](http://www.mdssystem.com). A User ID and Password are required.

### **General DENSO IMDS Guidelines**

A Material Data Sheet (MDS) must be created for each saleable part to DENSO. Most saleable parts should be reported as Components. Only saleable bulk items, such as adhesives or paint, and materials that require additional processing by DENSO, such as sheet aluminum or rolls of fabric, should be reported as semi-components.

To submit data to **DENSO Corporation at IMDS Company ID number 333**, all required chapters must be completed and free from errors.

## **Chapter 1 – Ingredients** **(Materials, Substances, Components, and Semi-Components)**

This chapter requires the user to define the part structure including all components, sub-components, materials and substances. Begin by defining all of the unique materials within your parent part(s).

## Materials ( ):

Materials are chemical or compound mixtures like plastics, ceramics, or metal alloys. Materials must be created and internally released before they can be attached to a component or semi-component. Materials are further defined by their chemical composition as explained in the Substance section.

To create a material record, select Create from the menu on the left and then select the Material button. Select the material classification, and then continue to complete the required information. Descriptions of the Material fields are provided below. Input a minimum of the required information and save the record. The material must then be internally released to be available as a selection when defining a component or semi-component.

### Material Details tab

Field Name	Description	Required/ Optional
Classification	Select the applicable IMDS material classification from the list.	Required
Symbol	Polymer symbol (see ISO 1043), where applicable. <b>For a partial list of possible material symbols, please see Appendix III</b>	Optional/ (Required for Plastic (5.x) Classifications)
Name	Enter the common industry name for the material followed by more description (e.g. steel 1010). Consult applicable standards for naming guidelines (e.g. ISO 1043-1 for plastics, EN10027 for steel and iron, ISO1629 for elastomers). <b>For a partial list of possible material names, please see Appendix II</b>	Required
Trade name	The material trade name is usually based on who supplied the material. Also known as commercial name. If you have multiple materials with the same Material Name + Manufacturer, use this field to differentiate them.	Optional
Internal Material-No.	Supplier or DENSO Material number	Optional
Std Material-No.	Applicable for metals	Optional
Norms/Standards	Enter all external norms and standards (e.g. ISO, SAE, etc.).	Optional
Inhouse Norms	Your company's norms for the material (DENSO)	Optional
Supplier	Name of material supplier(s)	Required
Remark	General comments regarding this material information submission.	Optional
Development Sample Report	"First Sample Approval Report" (assembly part level only). Provided by supplier to customer confirming achievement of general design parameters. Check for "Yes", clear for "No".	Required

## Materials Recyclate tab

Recyclate information is required for materials with classification categories of 1, 2, 3, 4, or 5. The Recyclate tab appears when a material with any of these classifications is referenced under a component or semi-component. The IMDS default entry is “no”.

Field Name	Description	Required/Optional
Does the material contain recyclate?	Select Yes if the material contains recycled content (post-industrial or post-consumer). Select No if the material is 100% virgin material. <i>Note:</i> regrind is not considered recyclate.	Required for specified material classifications
Content of post industrial recyclate	Provide portion of material that is post-industrial recyclate. Reported as the percent range of a material's weight that is post-industrial recycled material.	Required
Content of post consumer recyclate	Report the Post-Consumer Recyclate % of the material. Reported as the percent range of a material's weight that is post-consumer recycled material.	Required

Contact the DENSO help desk if you are unsure whether the recyclate in your materials is considered post-industrial or post-consumer.

## Substances :

Further define the material by providing the details listed in the table below for each of the substances within the material. To add a substance to a material, highlight the material to be defined and then click the button showing the blue triangle. Perform a search by substance name, Chemical Abstract Service (CAS) number, EU-Index, or Eines number to locate a substance. IMDS users cannot define new substances; they must be selected from the available list.

**Important Note - All GADSL listed substances must be reported, including those present in proprietary materials. Proprietary substances not on the GADSL list may be reported as “Misc. – Not Declarable”. However, DENSO enforces the 10% rule. This rule allows a MAXIMUM of 10% joker substances (has the word “system” in place of a CAS number) per material. Please note that secret substances count toward this 10% rule.**

Field Name	Description	Required/Optional
Name	Substance name	Auto-populated
Eines-No.	European Inventory of Existing Commercial Substances Number, a system for classifying and labeling chemical substances, containing more than 100,000 substances of which 2,500 are defined as dangerous	Auto-populated
EU-Index	European Union Index number for chemicals taken from Annex I, Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions	Auto-populated

	relating to the classification, packaging, and labeling of dangerous substances	
CAS No.	Chemical Abstracts Service number	Auto-populated
GADSL category	GADSL Classification of Prohibited or Declarable	Auto-populated
Synonyms	Other common substance names for selected substance	Auto-populated
Portion	Indicate percentage of substance found in material, as a 1) range, 2) fixed portion, or 3) balance of material, to equal 100%	Required

**Components (   ):**

Components are parts that have a defined weight and shape and require only assembly by DENSO. A component can either be an assembly or a sub-component within an assembly. To create a component, select the Create option from the menu on the left and then select the component button. To add additional sub-components, click the button showing the red square.

Field Name	Description	Required/Optional
Description	Supplier part name according to DENSO request	Required
Part/Item No.	Supplier part number or part number as requested by DENSO. DENSO requested part numbers are typically 12 digits (two letter prefix followed by 10 numbers). Do NOT include hyphens (-) or blank spaces in DENSO part numbers. (ie report part as TN1234567890 vs. TN 123456-7890)	Required
Measured Weight per Item	Weight of single item in g or kg	Required
Tolerance	Enter the maximum percentage of weight allowance caused by the production of the item.	Optional
Calculated Weight per item	Displays the calculated weight of child parts or materials for the component and % of deviation from the Measured Weight	-derived-
Polymeric part(s) marked	Specify whether polymeric parts within the component are marked according to ISO 1043 and ISO 11469.	Required for plastic (5.x) classifications
Development Sample Report	"First Sample Approval Report" (assembly part level only). Confirms supplier achievement of general design parameters. Check for "Yes", clear for "No".	Required

Materials are attached to bottom level components to define its material composition by clicking on the component and then clicking the button showing the green circles. Find the material by entering search criteria and press the Search button. Highlight the appropriate material from the results screen and press the Apply button.

**Material Application tab**

When adding a material that contains any restricted substances to a component, the reason for use must be declared by providing an Application Code. An Application tab will appear for a material with restricted substances after selecting it for use in a component.

An Application Code is required whenever lead (and lead compounds), hexavalent chromium (and hexavalent chromium compounds), mercury (and mercury compounds), cadmium (and cadmium compounds), nickel (and nickel compounds) and polycyclic aromatic hydrocarbons (and PAH compounds) are reported.

From the Application tab for a material, select the link provided under the Application heading for the Basic Substance. IMDS will display a list of appropriate Application Code selections for the material and substance combination reported. Select the appropriate Application from the selections provided.

**Semi-Components** (  ):

A semi-component is an item that requires further processing by DENSO (e.g. cutting to size) in order to be a component. A semi-component is identical to a component in that it is comprised of one or more materials, but semi-components do not have fixed weights. A semi-component can be attached to a component to help define that component. To create a semi-component, select the Create option from the menu on the left and then select the Semi-component button. When a semi-component is added to a component, a weight must then be defined.

Field Name	Description	Required/Optional
Article Name	Supplier part name according to DENSO request	Required
Item-/Material No.	Supplier part number according to DENSO request	Required
Weight	Weight in g or kg	Required (when attached to a component)

Materials are attached to bottom level semi-components to define its material composition by clicking on the semi-component and then clicking the button showing the green circles. Find the material by entering search criteria and press the Search button. Highlight the appropriate material from the results screen and press the Apply button.

**Chapter 2 - Recyclate information**

This chapter has been deactivated. Recyclate information for new MDSs is input on the Detail tab for a Material within Chapter 1.

**Chapter 3 - Supplier data**

Chapter 3 requires your internal company and contact information for the MDS.

Field Name	Description	Required/Optional
Organization unit	Only used if your company's IMDS account is subdivided into organizational units.	Required

Field Name	Description	Required/ Optional
Contact Person	Individual that can answer questions regarding submitted MDS	Required
Telephone No.	Telephone number of contact	Required
Fax No.	Fax number of contact	Required
E-mail address	E-mail address of contact	Required
Active	For use by Client Managers only.	Required

## **Chapter 4 - Recipient data**

Submit data to DENSO Corporation, **IMDS ID 333**, via the Send (allows one recipient) or Propose (allows several recipients) options.

Field Name	Description	Required/ Optional
Recipient	DENSO Corporation	Required
Company- / Org.-ID	333	Required
Part/Item No.	Part number as requested by DENSO. DENSO requested part numbers are typically 12 digits (two letter prefix followed by 10 numbers). Do NOT include hyphens (-) or blank spaces in DENSO part numbers. (ie. report part as TN1234567890 vs. TN 123456-7890)	Required
Description	Part name as provided by DENSO	Required
Drawing No.	Drawing number of this part	Optional
Drawing date:	Date of part drawing	Optional
Drawing Change Level:	Change level of part drawing	Optional
Report No.	Number of the First Sample Approval Reports for the product (of which this IMDS submission may form a part)	Optional
Date of Report:	Date of the First Sample Approval Reports	Optional
Purchase Order No.	DENSO purchase order number referencing this part	Optional
Bill of Delivery No.	Bill of delivery number referencing this part	Optional
Supplier Code	Supplier code as provided by DENSO, typically DENSO plant code (DMTN, ANC. etc.) + DENSO plant assigned supplier number (e.g. DMTNP03)	Required

Suppliers should check whether MDSs submitted to DENSO have been accepted or rejected. Rejected data must be revised according to the reasons for rejection, and resubmitted in a timely manner.

### **PPAP/ISIR Documentation**

Suppliers must include documentation that SoC data has been accepted for their parts as part of their PPAP/ISIR package to DENSO. Provide the DENSO plant PPAP/ISIR coordinator with an IMDS status report showing acceptance of the part and the associated IMDS number. To generate the status report, first search for the part from

the Sent menu option. Select the Print icon at the top of the IMDS window, open the \*.pdf file when prompted and then select Print from the File menu in Adobe Acrobat.

The DENSO PPAP/ISIR coordinator will verify the IMDS number, part number, recipient and status from the print screen provided.

MDS - MATERIAL DATA SYSTEM - Microsoft Internet Explorer

status of sent MDSs

Part/Item No., Item- /Mat.-No., Material No.:447190-5057  
1 item found. Ordered descending by "transmitted"

No.	T	Article Name	ID version	Part/Item No...	transmitted	to comp. (Or...	Status
1		COMPRESSOR ASS...	59091769 / 1	447190-5057	01/17/2007	DENSO Corp...	acpt...

Print Button

https://www.mdssystem.com/StatusViewResultPage.do?forceRefresh=1169060830605&pdf=true&exportType=5 - Microsoft Internet Explorer

IMDS Report: status of sent MDSs Page: 1 / 1  
User: Townsend, Robert Date: 1/17/07 8:06:47 PM

status of sent MDSs

Search Criteria: Part/Item No., Item- /Mat.-No., Material No.:447190-5057  
Number of results: 1  
Ordered descending by "transmitted".

No.	T	Article Name	ID version	Part/Item No., Item- /Mat.-No., Material No.	transmitted	to comp. (Org-Unit) [ID-No.]	Status
1	Component	COMPRESSOR ASSY, W/MAGNET CLUTCH	59091769 / 1	447190-5057	01/17/2007	DENSO Corporation [333]	acpt 01/17/2007

This is an uncontrolled copy of a document created by IMDS. End of the report.

Done Unknown Zone

## **IMDS Submittal Checklist**

The following items are common reasons for data rejections by DENSO. Verify these items prior to submitting data to DENSO via IMDS.

### Components

Does the part number match the part number as requested by DENSO/ASMO?

Have you indicated whether components with 5.1x classified materials are marked according to ISO 1043 and ISO 11469?

### Materials

Does the Material Name contain the easily identified generic material name (e.g. steel, polypropylene, bronze)?

Is the Symbol field populated for all Plastic (5.x) Material Classifications?

Is a minimum of 90% substance content provided for each material (with a maximum of 10% secret or joker substances)?

Is an Application Code provided for materials containing lead, mercury, cadmium, hexavalent chromium, or PAHs (or their compounds)?

### Recipient Data

Have you provided your DENSO/ASMO supplier code?

## Appendix I

### Frequently Asked Questions

Questions are grouped based on their subject matter, as follows:

Group 1: General questions

Group 2: Material related questions

#### **Group 1 – General Questions**

**1. What part numbers should I report to DENSO?**

**A:** All requested parts and all PPAP/ISIR parts should be reported. All parts should be reported as a DENSO Part number, typically formatted as a 12 digit part number (2 letter prefix followed by 10 numbers).

**2. I am not the correct contact at my company for IMDS information. Who can I notify of a contact change?**

**A:** Please contact the DENSO SoC Help Desk at 248-372-8454 or [EAD\\_SoC@denso-diam.com](mailto:EAD_SoC@denso-diam.com) with the name, e-mail address and phone number of the correct IMDS representative at your company.

**3. I do not recognize or do not supply the part numbers requested of my company. How do I get them removed from my to-do list?**

**A:** Please contact the DENSO SoC Help Desk at 248-372-8454 or [EAD\\_SoC@denso-diam.com](mailto:EAD_SoC@denso-diam.com) with the part numbers that are not recognized or not supplied to DENSO and any other pertinent information. DENSO will provide more information to help you identify the part or remove them from the list where you are not the correct supplier.

**4. I have received a reminder that my parts have not been completed. I thought this task was finished.**

**A:** Please verify that the parts were sent to IMDS ID number 333 and that they have not been rejected.

**5. Where can I find a copy of the IMDS recommendations?**

**A:** IMDS recommendations are on the IMDS system. Once you log-on to IMDS, press the “Recommendation” button on the left panel of the screen. This link will take you to all of the IMDS recommendations.

**6. My data has been rejected in IMDS. How do I view the rejection and make the required corrections?**

**A:** To view a rejection, you must first search for the rejected part from either the “sent” menu or the “search” menu. Click the “recd” link under the status column to view the rejection reason. To make corrections to a part that has not been internally released, return to the search results screen and press the Modify button. To make corrections to a part that has been internally released, you must first make corrections on a copy (make a copy with a new version) of the part.

**Group 2 - Material related questions**

**1. What is the difference between a pseudo substance and a joker or wildcard substance?**

**A:** A pseudo substance has a dash (-) instead of a CAS number. A pseudo substance gives an accurate description of the substance or substance group but does not give a CAS number. Examples include “Acrylic resin” or “Cotton-fibre”. A joker or wildcard substance has the word “system” instead of a CAS number. These substances do not give a description of the substance. Examples include “Misc., not to declare” or “Further Additive, not to declare”. It is important to remember that pseudo substances are accepted as real substances and are therefore not considered against of the 90% disclosure rule.

## **Appendix II**

### **Examples of Material Names**

**Important note:** Below are examples of material names; this is not an exhaustive list.

#### **Example Material Names**

<b>Material Classification</b>	<b>Material Classification Name</b>	<b>Material Names</b>
1.1.1	Unalloyed, Low alloyed	Steel, silicon steel
1.1.1	Unalloyed, Low alloyed	Iron, electromagnetic soft iron
1.1.1	Unalloyed, Low alloyed	Steel wire
1.1.1	Unalloyed, Low alloyed	Steel, low alloyed
1.1.1	Unalloyed, Low alloyed	Steel, plating sheet
1.1.1	Unalloyed, Low alloyed	Steel, high-tension steel plate
1.1.1	Unalloyed, Low alloyed	Steel, carbon steel
1.1.1	Unalloyed, Low alloyed	Steel, hot-rolled steel sheet
1.1.1	Unalloyed, Low alloyed	Steel, welding bars
1.1.1	Unalloyed, Low alloyed	Steel, cold-rolled steel sheet
1.1.2	Stainless Steels	Steel, stainless steel
1.1.2	Highly Alloyed	Steel, highly alloyed
2.1.2	Aluminum Alloys	Aluminum bare (single layer)
2.1.2	Aluminum Alloys	Aluminum clad (2 layers)
2.1.1	Cast Aluminum Alloys	Aluminum alloy
2.1.2	Wrought Aluminum Alloys	Aluminum brazing metal
2.1.2	Aluminum Alloys	Aluminum bonding wire
3.1	Copper	Copper, general wire
3.1	Copper	Copper wire, heat resistant
3.1	Copper	Copper, pure (C1020-C1221)
3.1	Copper	Copper electrolytic cathode
3.1	Copper	Copper powder
3.2	Copper Alloys	Red brass (C2100-C2400)
3.2	Copper Alloys	Brass (C2600-C4640)
3.2	Copper Alloys	Bronze/phosphor bronze (C5102-C6301)
3.2	Copper Alloys	Copper nickel silver alloy (C7060-C7150)
3.2	Copper Alloys	Copper beryllium alloy (C1700-C1720)
3.2	Copper Alloys	Copper alloy
3.2	Copper Alloys	Copper brazing filler metal
3.2	Copper Alloys	Copper, phosphor copper brazing filler metal
3.2	Copper Alloys	Copper tungsten
3.3	Zinc Alloys	Zinc alloy ingots
3.3	Zinc Alloys	Zinc wire, thermally separated
3.4	Nickel Alloys	Nickel plating solution
3.4	Nickel Alloys	Nickel alloy
3.4	Nickel Alloys	Nickel electrode material
3.4	Nickel Alloys	Nickel, pure
3.4	Nickel Alloys	Nickel copper alloy
3.5	Lead Alloys	Lead metal
3.5	Lead Alloys	Lead Solder without resin flux
3.5	Lead Alloys	Lead Solder with resin flux
3.5	Lead Alloys	Lead ingot
4.1	Platinum	Platinum plating solution
4.2	Other Metals	Tin metal
4.2	Other Metals	Magnesium metal
4.2	Other Metals	Silver metal
4.2	Other Metals	Gold

4.2	Other Metals	Platinum
4.2	Other Metals	Palladium brazing metal
4.2	Other Metals	Tungsten, pure
5.1.a	Filled Thermoplastics	Polypropylene (PP) (Filled)
5.1.a	Filled Thermoplastics	Nylon 66 (PA66) (Filled)
5.1.a	Filled Thermoplastics	Nylon 6 (PA6) (Filled)
5.1.a	Filled Thermoplastics	Polybutylene Terephthalate (PBT) (Filled)
5.1.a	Filled Thermoplastics	Acetal (POM) (Filled)
5.1.a	Filled Thermoplastics	Polycarbonate (Filled)
5.1.b	Unfilled Thermoplastics	Polypropylene (Unfilled)
5.1.b	Unfilled Thermoplastics	Polyethylene (Unfilled)
5.1.b	Unfilled Thermoplastics	Nylon 66 (PA66) (Unfilled)
5.1.b	Unfilled Thermoplastics	Nylon 6 (PA6) (Unfilled)
5.2	Thermoplastic Elastomers	Olefin elastomers
5.2	Thermoplastic Elastomers	Polyester elastomers
5.3	Elastomers	Rubber, natural
5.4.1	Polyurethane	Urethane
5.5.2	Textiles	Nomex
5.4.2	Unsaturated Polyester	Polyester, unsaturated
5.4.3	Others Plastics	Epoxy
5.4.3	Others Plastics	Fluorocarbon resin
5.4.3	Others Plastics	Silicon resin
5.4.3	Others Plastics	Acrylic
5.4.3	Thermoset Plastics	Phenol
5.4.3	Thermoset Plastics	Resin Name, Thermoset
7.1	Modified Organic Natural Materials	Pressboard (plate)
7.1	Modified Organic Natural Materials	Paper
7.2	Ceramics	Activated carbon
7.2	Ceramics	Desiccating agent (Receiver)
7.2	Ceramics	Glass
7.2	Ceramics	Ceramics material
8.1	Electronics (e.g. pc boards, displays)	Silicon wafer
9.8	Electronics (e.g. pc boards, displays)	Flux

## Appendix III

### Examples of Material Symbols

**Important note:** Below are examples of material symbols; this is not an exhaustive list.

**Symbols for Commonly Used  
Plastics & Elastomers**  
Compilation based on SAE J1344, ISO 1629, and ASTM D1418

Family	Name	Standard Symbol
Plastic	Acrylonitrile/butadiene	AB
Plastic	Acrylonitrile/butadiene/acrylate	ABA
Plastic	Acrylonitrile/butadiene/styrene	ABS
Plastic	Acrylonitrile/ethylene/styrene	AES
Plastic	Acrylonitrile/methyl/methacrylate	AMMA
Plastic	Acrylonitrile/styrene/acrylate	ASA
Plastic	Cellulose acetate	CA
Plastic	Cellulose acetate butyrate	CAB
Plastic	Cellulose acetate propionate	CAP
Plastic	Cellulose formaldehyde	CF
Plastic	Cellulose nitrate	CN
Plastic	Cellulose propionate	CP
Plastic	Cellulose triacetate	CTA
Plastic	Chlorinated polyethylene	CPE
Plastic	Chlorinated poly (vinyl chloride)	CPVC
Plastic	Chlorosulfonylpolyethylene	CSM
Plastic	Epoxide, Epoxy	EP
Plastic	Ethyl cellulose	EC
Plastic	Ethylene/ethyl/acrylate	EEA
Plastic	Ethylene/methacrylate acid	EMA
Plastic	Ethylene/propylene/diene	EPDM
Plastic	Ethylene/tetrafluoroethylene	ETFE
Plastic	Ethylene/vinyl acetate	E/VAC
Plastic	Tetrafluoroethylene propylene copolymer	FEPM
Plastic	Furan formaldehyde	FF
Plastic	Melamin-formaldehyde	MF
Plastic	Phenol-formaldehyde	PF
Plastic	Polyamid	PA
Plastic	6 Polyamid	PA6
Plastic	66 Polyamid	PA66
Plastic	46 Polyamid	PA46
Plastic	69 Polyamid	PA69
Plastic	11 Polyamid	PA11
Plastic	12 Polyamid	PA12
Plastic	610 Polyamid	PA610
Plastic	612 Polyamid	PA612

Plastic	Polyamid-imide	PAI
Plastic	Polyacrylonitrile	PAN
Plastic	Polyacrylamid	PARA
Plastic	Polyacrylether	PAE
Plastic	Polyacryletherkeone	PAEK
Plastic	Polyacrylsulfone	PAS
Plastic	Polybutene-1	PB
Plastic	Polycarbonate	PC
Plastic	Polyester, thermoplastic	
Plastic	Polyacrylate (polyacrylterephthalate)	PAT
Plastic	Copolyester (polyacrylterephthalate)-(Liquid Crystal Polymer)	ARP
Plastic	Polybutylene terephthalate	PBT
Plastic	Polyether block amide	PEBA
Plastic	Polyethylene terephthalate	PET
Plastic	Polyester, thermoset (SMC / BMC / TMC)	UP
Plastic	Polyetherimide	PEI
Plastic	Polyetherketone	PEK
Plastic	Polyether-etherketone	PEEK
Plastic	Polyethersulfon	PES
Plastic	Polyethylene	PE
Plastic	Linear low density	PE-LLD
Plastic	Low density	PE-LD
Plastic	Linear medium density	PE-LMD
Plastic	Medium density	PE-MD
Plastic	High density	PE-HD
Plastic	Ultra-high molecular weight	PE-UHMW
Plastic	Poly (ethylene oxide)	PEOX
Plastic	Polyimide	PI
Plastic	Polyisobuthylene	PIB
Plastic	Poly (methyl methacrylate)	PMMA
Plastic	Poly (methyl methacrylate imide)	PMMI
Plastic	Polyoxymethylene, polyformaldehyd	POM
Plastic	Polyphenylene ether	PPE
Plastic	Polypropylene	PP
Plastic	Polystyrene	PS
Plastic	Polysulfone	PSU
Plastic	Poly (propylene oxide)	PPOX
Plastic	Poly (phenylene sulfide)	PPS
Plastic	Poly (phenylene sulfone)	PPSU
Plastic	Polytetrafluoroethylene	PTFE
Plastic	Polyurethane, thermoset (unsaturated)	PUR
Plastic	Poly (vinyl butyral)	PVB
Plastic	Poly (vinyl chloride)	PVC
Plastic	Silicone	SI

Plastic	Styrene/acrylonitrile	SAN
Plastic	Styrene/butadiene	SB
Plastic	Styrene/maleic anhydride	SMA
Plastic	Urea-formaldehyde	UF
Commercial Blend	Acrylonitrile/butadiene/styrene + polyamid	ABS + PA
Commercial Blend	Acrylonitrile/butadiene/styrene + polycarbonate	ABS + PC
Commercial Blend	Acrylonitrile/butadiene/styrene + polyphenylene sulfone	ABS + PPSU
Commercial Blend	Acrylonitrile/butadiene/styrene + polytetrafluoroethylene	ABS + PTFE
Commercial Blend	Acrylonitrile/butadiene/styrene + polyvinyl chloride	ABS + PVC
Commercial Blend	Acrylonitrile/butadiene/styrene + styrene maleic anhydride	ABS + SMA
Commercial Blend	Acrylonitrile/butadiene/styrene + thermoplastic polyurethane	ABS + TPUR
Commercial Blend	Acrylonitrile/butadiene/acrylate + polycarbonate	ABS + PC
Commercial Blend	Acrylonitrile/butadiene/acrylate + polymethyl methacrylate	ABS + PMMA
Commercial Blend	Acrylonitrile/butadiene/acrylate + polyvinyl chloride	ABS + PVC
Commercial Blend	Polyamid + ethylene methacrylate acid (ionomer)	PA + EMA
Commercial Blend	Polyamid (amorphous) blend	PA+
Commercial Blend	Polyamid + polyethylene	PA +PE
Commercial Blend	Polyamid + styrene/acrylonitrile	PA + SAN
Commercial Blend	Polycarbonate + acrylonitrile/butadiene/acrylate	PC + ABS
Commercial Blend	Polycarbonate + polybutylene terephthalate	PC + PBT
Commercial Blend	Polycarbonate + polyethylene terephthalate	PC + PET
Commercial Blend	Polycarbonate + polymethyl methacrylate	PC + PMMA
Commercial Blend	Polycarbonate + styrene maleic anhydrid	PC + SMA
Commercial Blend	Polycarbonate + thermoplastiv polyurethane	PC + TPUR
Commercial Blend	Polybutylene terephthalate + polyethylene terephthalate	PBT + PET
Commercial Blend	Polybutylene terephthalate + polyphenylene ether	PBT + PPE
Commercial Blend	Polyethylene terephthalate + polymethyl methacrylate	PET + PMMA
Commercial Blend	Polyethylene terephthalate + polyphenylene sulfone	PET + PPSU
Commercial Blend	Polyoxymethylene + polytetrafluoroethylene	POM + PTFE
Commercial Blend	Polyphenylene ether + polyamid	PPE + PA
Commercial Blend	Polyphenylene ether + high impact polystyrene	PPE + PS
Commercial Blend	Polyphenylene sulfide + polytetra-fluoroethylene	PPS + PTFE
Commercial Blend	Polypropylene + ethylene/propylene/diene	PP + EPDM
Commercial Blend	Polysulfone + acrylonitrile/butadiene/styrene	PSU + ABS
Commercial Blend	Polysulfone + polyethyleneterephthalate	PSU + PET
Commercial Blend	Polyvinyl chloride + polymethyl methacrylate	PVC + PMMA
Commercial Blend	Polyvinyl chloride + polyurethane	PVC + PUR
Commercial Blend	Styrene/maleic anhydrid + high impact polystyrene	SMA + PS
Thermoplastic Elastomer	Fully crosslinked elastomeric alloy	FCEA
Thermoplastic Elastomer	Thermoplastic elastomer, polyether block amide	PEBA
Thermoplastic Elastomer	Styrene butadiene styrene block copolymer	SBS
Thermoplastic Elastomer	Styrene ethylene/butylene styrene block copolymer	SEBS
Thermoplastic Elastomer	Styrene ethylene/propylene styrene block copolymer	SEPS
Thermoplastic Elastomer	Styrene isoprene styrene block copolymer	SIS

Thermoplastic Elastomer	Thermoplastic elastomer, chlorinated ethylene alloy	TECEA
Thermoplastic Elastomer	Thermoplastic elastomer, ether-ester	TEEE
Thermoplastic Elastomer	Thermoplastic elastomer, olefinic	TEO
Thermoplastic Elastomer	Thermoplastic elastomer, styrenic	TES
Thermoplastic Elastomer	Thermoplastic polyurethane	TPU
Thermoplastic Elastomer	Thermoplastic polyurethane, reinforced	TPUR
Other Automotive Elastomer	Acrylic rubber	ACM
Other Automotive Elastomer	Copolymer of ethylacrylate and acrylonitrile	ANM
Other Automotive Elastomer	Polyester urethane	AU
Other Automotive Elastomer	Polyether urethane	EU
Other Automotive Elastomer	Butadien rubber	BR
Other Automotive Elastomer	Chloro-isobutene-isoprene rubber	CIIR
Other Automotive Elastomer	Chloroprene rubber	CR
Other Automotive Elastomer	Chlorosulfonylpolyethylene	CSM
Other Automotive Elastomer	Epichlorohydrin copolymer	ECO
Other Automotive Elastomer	Terpolymer of ethylene, propylene, and a dien	EPDM
Other Automotive Elastomer	Fluoroelastomer	FPM
Other Automotive Elastomer	Fluorosilicone elastomer (with methyl groups)	FMQ
Other Automotive Elastomer	Fluorosilicone elastomer (with vinyl groups)	FVMQ
Other Automotive Elastomer	Silicone elastomer (with methyl groups only)	MQ
Other Automotive Elastomer	Silicone elastomer (with methyl and vinyl groups)	VMQ
Other Automotive Elastomer	Acrylonitrile/butadiene (nitrile) rubber	NBR
Other Automotive Elastomer	Hydrogenated acrylonitrile/butadiene rubber	HNBR
Other Automotive Elastomer	Carboxylated acrylonitrile/butadiene (nitrile) rubber	XNBR
Other Automotive Elastomer	Natural, isoprene rubber	NR
Other Automotive Elastomer	Styrene/butadiene rubber	SBR

### Symbols for Commonly Used Fillers and Reinforcing Materials

Compilation based on SAE J1344, ISO 1629, and ASTM D1418

Symbol	Materials	Symbol	Form / Structure
B	Boron	B	Beads, spheres, balls
C	Carbon	C	Chips, cuttings
E	Clay	D	Powder
G	Glass	F	Fiber
K	Calcium carbonate	G	Ground
L	Cellulose	H	Whisker
M	Mineral, metal	K	Knitted fiber
P	Mica	L	Layer
Q	Silica	M	Mat (thick)
R	Aramid	N	Non-woven (fabric, thin)
S	Synthetic, organic	P	Paper
T	Talcum	R	Roving
W	Wood	S	Scale, flake
Z	Others	T	Cord
		V	Veneer
		W	Woven fabric
		Y	Yarn
		Z	Others

**Material Symbols: Detailed Examples**

Glass spheres	GB
Glass fiber	GF
Glass fiber/mineral (1)	(GF + M)*
Glass fiber/mica (2)	(GF + P)*
Glass mat	GM
Carbon, graphite	C
Carbon fibers	CF
Aramid fibers	RF
Mineral (1)	M
Clay (2)	E
Calcium carbonate (2)	K
Mica (2)	P
Talc	T
Wood powder	WD

\* Mixtures of fillers may be shown in parentheses by combining the relevant symbols with the "+" sign

1. The "mineral" designation indicated here is generic i.e., the structure of the mineral used as a filler is unknown
2. When specific minerals are used as fillers, such as clay, mica, talc, etc., the precise symbols should be used. The form of the "mineral" should also be identified when available, e.g. powder (D), fiber (F), etc.