



Supplier guideline – chemical reporting

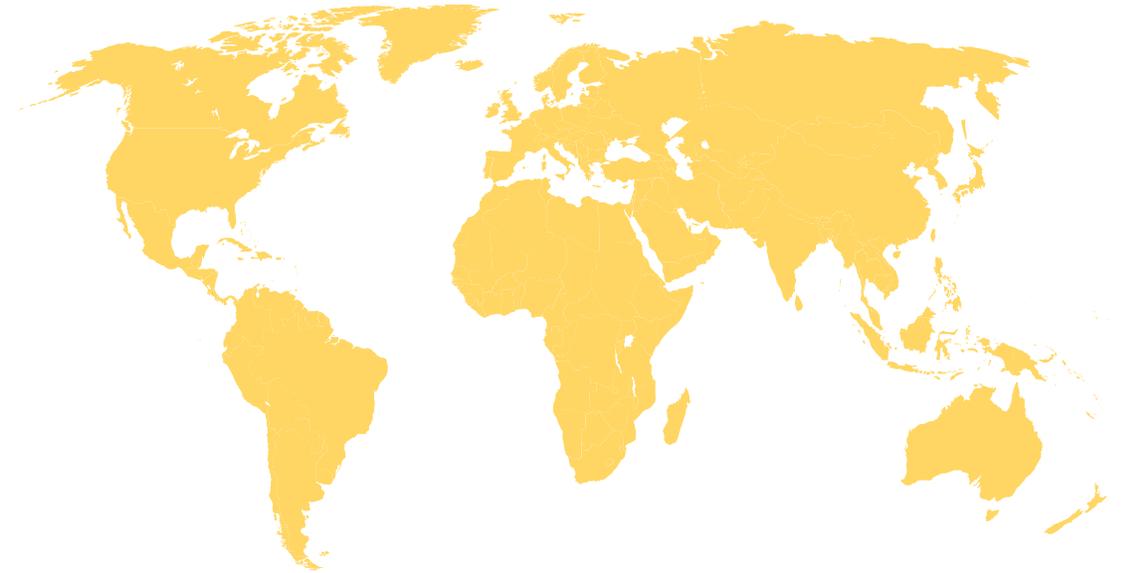
Environmental and Health Hazardous Material Reports and Material Declarations

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 - Environmental and Health Hazardous Materials Reports
 - Material Declarations



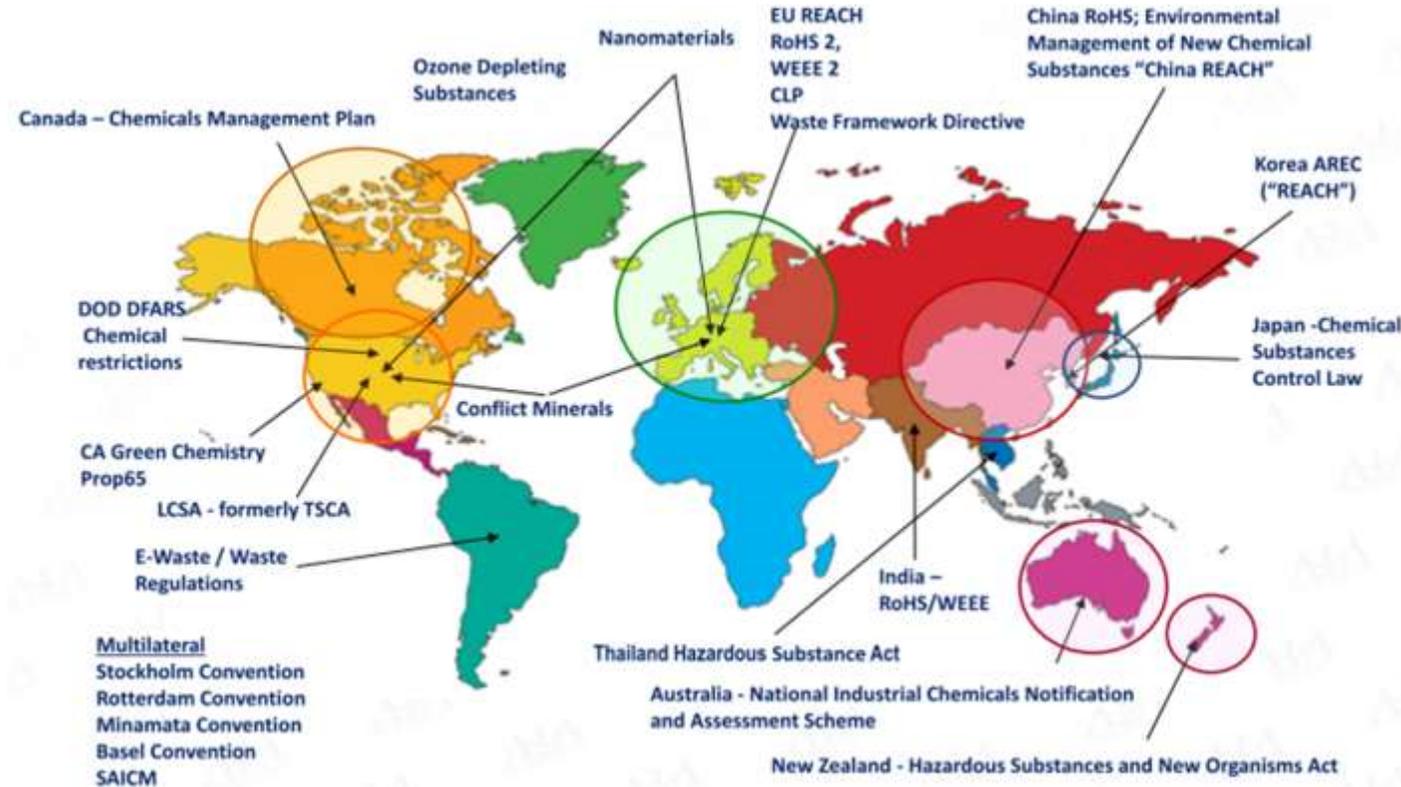
Background

- In the past, Saab generally accepted a confirmation and/or statement from suppliers and manufacturers that they comply with restrictions and regulations regarding substances.
- Due to increased demand for substance reporting in the supply chain, mainly because of the REACH regulation, regulatory compliance data for articles and products needs to be improved.
- To comply with regulations substance data needs to be reported in Material Declarations (for standardized component parts/articles) or in Environmental and Health Hazardous Materials Reports (for products or sub-assemblies/subsystems).



Aerospace & Defence industry challenges

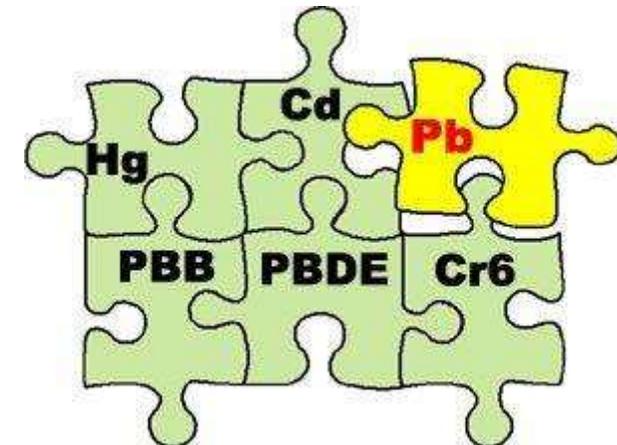
- Laws and regulations
 - Increasing level of environmental requirements all over the world
 - Regulatory obligations for chemicals, chemicals/substances in products
 - Bans/restrictions of some “high-risk” substances
 - Substance reporting requirements
 - Product sustainability efforts
- Challenges
 - Comply with current requirements
 - Anticipate and prepare for emerging requirements



Copyright of IAEG

Key regulatory drivers

- European REACH Regulation*
 - Restriction of certain uses of substances
 - Authorization needed for some substances
 - Requirements on substance reporting
 - Obsolescence risk due to regulation
- Restriction of Hazardous Substance (RoHS)*
 - European and various other country RoHS regulations limit material content of electronic and electrical equipment
 - Limitations may have adverse impacts on article product reliability (e.g. “lead-free” solder)
 - * EC1907/2006 Registration, Evaluation, Authorisation and restriction of Chemicals (REACH)
 - * Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE)



Article definition

- Summary of opinion
 - The European Court of Justice ruled on 10th September 2015, on EU REACH Regulation article definition, that each of the articles, that are assembled or joined together in a complex product, remain as articles and are covered by the relevant duties to notify and provide information when they contain a substance of very high concern in a concentration above 0.1% of their mass.
- Consequence
 - Components are articles even if contained in complex products/objects.



Executive summary of EU regulation REACH and its product related requirements



Registered substances

- Manufacturers and importers within EU/EEA register to ECHA (includes comprehensive documentation) substances which are produced or imported more than 1 tonne/year.

Candidate List

- Substances are referred to as candidate substances and are included on the Candidate List which is updated 2 times/year.
- Manufacturers, importers, and suppliers of a product which contains a substance on the Candidate List have legal obligations: the supplier is obligated to inform the customer (applies always business to business) if a article contains a candidate substance in a concentration above 0.1% (weight by weight*).
- The requirement is to inform that the substance is included (where) and which substance (unique identifier for the substance, i.e. CAS-number or substance name)

** Weight by weight regards the candidate substance's weight with regards to lowest individual part, i.e. not to the mass of complete system (aircraft)*

Annex XIV – Authorisation List

- Lists all substances which requires authorisation from ECHA (which European Commission decide on). These substances cannot be placed on the market or used after a given date (sunset date), unless an authorisation is granted for their specific use. There is thus a need to apply for authorisation for the use of a substance but not for the use of articles containing the substance.
- Time limited authorisation can be applied for in order to continue a specific use of the substance.

Annex XVII

- If the use of a substance (e.g. asbestos) result in unacceptable risks, the substance can be overall prohibited **or** a certain use of the substance can be restricted.

Within EU/EEA

- Obligation to provide information on candidate substances.
- Authorisation is required for Annex XIV substances.
- Restrictions in accordance with Annex XVII applies.

Non-EU/EEA

- Obligation to provide information on candidate substances, includes also Annex XIV substances.
- No need to apply for authorisation for Annex XIV substances included in articles.
- Restrictions in accordance with Annex XVII applies.



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RoHS - Restriction of Hazardous Substances for EEE

RoHS 2002/95/EC

- 1,2: Home Appliances
- 3: IT and Telecom
- 4: Consumer
- 5: Lighting
- 6: Tools
- 7: Toys, leisure, sports
- 10: Automatic disp.

1 July 2006



RoHS 2 (Recast) 2011/65/EU

- 1,2
- 3
- 4
- 5
- 6
- 7
- 10

3 Jan 2013

RoHS 2 (Recast)

- 8: Medical Devices
- 9: Monitoring & Control

22 July 2014

- 8: In Vitro Medical Diagnostic Device

22 July 2016

- 9: Industrial Monitor & Control

22 July 2017

RoHS 2 (Recast)



Annex II: Restricted Substances

Annex III: Exemptions

6(c) Copper alloy containing up to 4 % lead by weight
...

Continually adding and expiring

Annex IV: Medical, M&C Exemptions

Specific to medical devices and monitoring and control
...

Annex IV: Decl. of Conformity

EU Declaration of Conformity
...

RoHS 2 (Revision 2015/863 (Phthalates))

- 1,2
- 3
- 4
- 5
- 6
- 7
- 10

22 July 2019

RoHS 2 (Phthalates)

- 8
- 9

- 11: Other EEE

22 July 2021

22 July 2019

RoHS 2 (Phthalates)

Annex II: Restricted Substances

Add (4) Phthalates:
DEHP 0.1%
BBP 0.1%
DBP 0.1%
DIBP 0.1%

RoHS

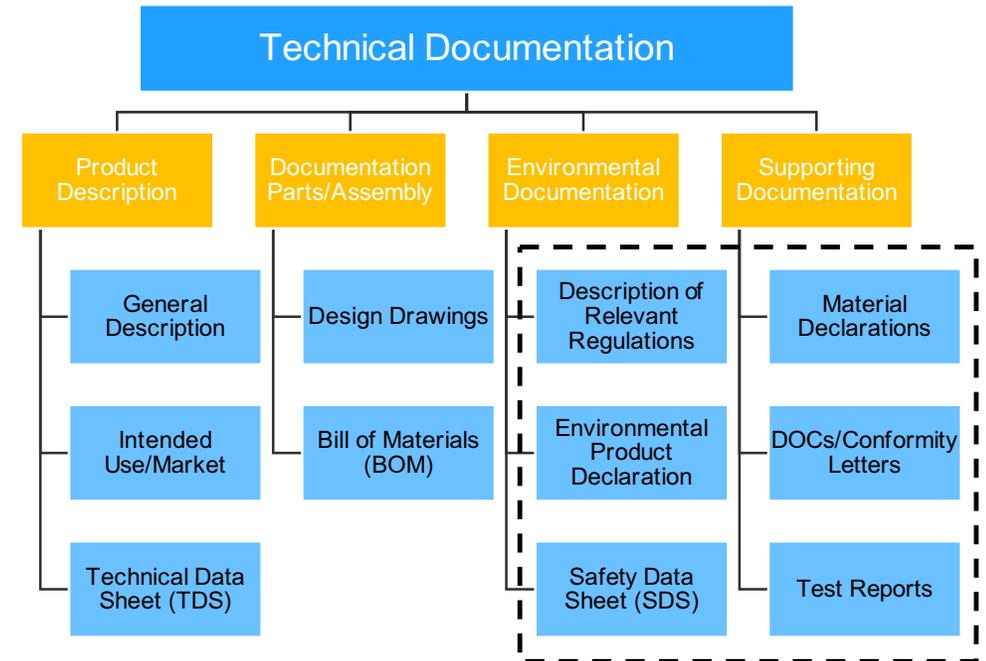
Restricted Substances

Cadmium (Cd)	0.01 %
Lead (Pb)	0.1 %
Mercury (Hg)	0.1 %
PBB	0.1 %
PBDE	0.1 %



Chemical reporting for suppliers

- Challenge
 - To sell products globally, suppliers and manufacturers need to ensure, understand, comply and keep up-to-date with an increasing number of substance regulations.
- Solutions
 - Use B2B information reporting standards as far as possible
 - Provide a Full Material Declaration (FMD) for the article, not just statements of compliance for a specific regulation
 - For products and subsystems provide a Environmental and Health Hazardous Material Report (EHHMR)
- Business benefits
 - Suppliers save time and costs to keep up-to-date
 - Compliance checks will be improved and costs of regulatory compliance program will be reduced
 - Risks are decreased for obsolescence activities, product and services for the entire supply chain



EHHMR is a overall product description and statement for environmental compliance status, data can be drawn from the boxed documents

Supplier declaration process (1/2)

- Saab general environmental requirements on all of our suppliers is to request a Full Material Declaration for standardized parts and articles.
- Requirements
 - Full Material Declaration in accordance with IPC-1752A standard for each part/article delivered.
 - For chemical products the supplier shall send Safety Data Sheets (SDS).
- Delivery and transaction
 - Saab prefer that the material declaration documented and delivered in XML format, and Excel.
 - In order to simplify the transfer of material declaration information to Saab, we prefer our suppliers to use one of the following web tools for exchange of substance information; [BOMcheck](#) or [IHS](#) (4DOnline CAPS Universe).

Supplier declaration process (2/2)

- Saab general environmental requirements on all of our suppliers is to request an Environmental and Health Hazardous Materials Report for products and subsystems.
- Requirements
 - An Environmental and Health Hazardous Materials Report shall at minimum contain the following headlines and contents, if there is relevant information to the related topics:
 - System description and definition
 - Referenced legal requirements and documents
 - Product analysis
 - Hazardous substances in products and services (placement, its location and weight) in accordance with GMS-0110
 - If applicable, hazardous substances used for maintenance of the products and services (placement, its location and weight) in accordance with GMS-0110
 - Substances restricted (substances which must not be used) in GMS-0110, if any, with a justification
 - Compliance statement
 - Product statement for hazardous substances according to Saab's requirements
 - Reach Article 33 Declaration, if applicable
- Delivery and transaction
 - Saab prefer that the Environmental and Health Hazardous Materials Report be documented and delivered in Word or Pdf format.

SAAB		DETAILED INFORMATION	1 (34)
Genet	Group Chemical Coordinator	Date	2019-03-18
Authorised by	Group Environmental Director	Classification Company Confidentiality	13
Classification Export Control	NOT EXPORT CONTROLLED	Classification Defence Security	Regulation
		Document ID	GMS-0110
Requirement - List of Hazardous Chemical Substances			
Table of Contents		Page	
1	Introduction	2	
2	List of Hazardous Chemical Substances	2	
2.1	Interpretation of hazardous chemical substances list	2	
2.2	Comments of terms in the substance table	3	
2.3	List of substances	3	
3	Main source, legislation, directives to be used to identify the concerned substances	32	
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Extra slides

- The following slides describes the content of Environmental and Health Hazardous Materials Report

Extended description

- **Definition**
 - Environmental and Health Hazardous Materials Report identifies hazardous substances and verifies if the product complies with environmental requirements and legislation.
- **Purpose**
 - To provide and report health and environmentally hazardous substances and materials in the product, including components and chemical products, and in some cases for chemical products to be used for maintenance.
- **Compliance Statement**
 - Product statement may relate to the following requirements, if relevant:
 - Conflict Minerals
 - Radioactive materials
 - Biocide(s)
 - RoHS
 - and other declarable substance lists



Component Information

Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Component Level	
				Percentage %	ppm	Percentage %	ppm
Bond Wire							
Other Nonferrous Metals and Alloys	Beryllium	7440-41-7	0.000004	0.0006	5	0.0000	0
Other Nonferrous Metals and Alloys	Calcium	7440-70-2	0.000010	0.0015	14	0.0000	0
Precious Metals	Gold	7440-57-5	0.689150	99.9980	999979	0.6532	6532
Sub-Total			0.689164	100	1000000	0.6532	6532

Extra slides

- The following slides describes the content of material declarations

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Material declaration (IPC-1752A standard)

- Material declaration is a reporting of substances and materials as a component, subassembly and/or product (article) contains
- The standards describe how and what the material content of the products should be declared between suppliers and customers
- The standards supports reporting of bulk materials, components, circuit boards, sub-systems and products
- Data Transfer Format specified is Extensible Markup Language (XML) (third party development)
- May contain statement such as:
 - Product includes battery
 - Specific risks
 - Exemption descriptions

Component Information							
Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Compliance Level	
				Percentage %	ppm	Percentage %	ppm
Band Wire							
Other Nonferrous Metals and Alloys	Barium	7440-41-7	0.00004	0.0008	5	0.0000	0
Other Nonferrous Metals and Alloys	Cadmium	7440-70-2	0.000010	0.0010	54	0.0000	0
Precious Metals	Gold	7440-57-0	0.000100	99.9980	99970	0.0002	0.0002
Sub Total			0.000154	100	1000000	0.0002	0.0002
Die Attach Adhesive							
Other Inorganic Materials	Silica	7621-89-6	0.020500	2.0000	20000	0.0204	200
Precious Metals	Silver	7440-22-4	1.025440	99.9990	999900	0.9700	9700
Thermoplastics	Epoxy	89854-11-0	0.434340	29.0000	299990	0.4117	4117
Sub Total			1.497740	100	1000000	1.4107	14100
Lead Frame							
Copper and its Alloys	Copper	7440-50-8	51.040147	96.1900	961890	40.3040	403040
Copper and its Alloys	Iron	7439-89-6	1.204621	2.2700	22700	1.1410	11410
Copper and its Alloys	Phosphorus	7723-14-0	0.015820	0.0200	200	0.0101	100
Metals and its Alloys	Nickel	7440-02-0	0.721711	1.3000	13000	0.6847	6840
Zinc and its Alloys	Zinc	7440-66-6	0.079601	0.1500	1500	0.0700	700
Sub Total			53.067900	100	1000000	49.3900	493900
Lead Frame Plating							
Nickel and its Alloys	Nickel	7440-02-0	0.893000	85.1200	851100	0.8010	8010
Precious Metals	Gold	7440-57-0	0.007440	0.7000	7000	0.0070	70
Precious Metals	Palladium	7440-05-3	0.000100	4.1000	4100	0.0071	71
Sub Total			0.899540	100	1000000	0.8052	8021
Mold Compound							
Other Inorganic Materials	Fused Silica	69676-06-0, 14984-46-1	30.702000	86.9100	869100	36.7000	367000
Other Plastics and Rubber	Carbon Black	1333-86-4	0.120034	0.3100	3090	0.1211	1211
Thermoplastics	Epoxy	89854-11-0	3.702000	12.7000	127000	5.4050	54050
Sub Total			44.524334	100	1000000	42.2070	422070
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-0	4.400241	100.0000	1000000	4.4201	44201
Sub Total			4.400241	100	1000000	4.4201	44201
Total			105.496884			100	1000000

IPC-1752A Material declaration classes

Class	Description	Declaration Type	Detailed Requirements
A	Reporting in Query/Reply format	Query/Reply	Supplier provides responses to standard queries and /or optional custom queries format
B	Material class reporting	Material Class	Supplier states the amount of different classes of materials within a product
C	Substance categories reporting at the product	Substance category compliance declaration	Supplier provides mass and/or concentration of substance category at the product level if above thresholds
D	Substances reporting at the homogeneous material level	Substance composition disclosure	Supplier provides location, mass, substances at homogeneous material level

- Saab always request Full Material Declaration in accordance with IPC-1752A Class D

IPC-1752A Class D file (Excel and XML) from Texas instr.



IPC-1752-2_class6_OPA633KP.xml

Texas Instruments Inc. Search results for "SN74LS00DBRE4"				Downloaded on 05/07/2013			
Current Production Information							
TI Part Number	SN74LS00DBRE4	Assembly Site	TI MALAY SIA A/T				
Lead/Ball Finish	CU NIPDAU	Package Type / Pins	DB 14				
Planned Lead/Ball Finish		Package Body Size (WxLxH) mm	5.3x6.2x1.95				
MSL / Reflow Ratings	Level-1-260C-UNLIM	Total Device Mass (mg)	143.697362				
Environmental Ratings Information							
Part Number Type	Pb-Free	JIG Material Content Compliance					
RoHS & High-Temp Compliant	Y	Green Compliant	Y				
Pb-Free (RoHS) Conversion Date	01-Aug-2003 (DC 0331)	Green Conversion Date	01-Jul-2005 (DC 0527)				
Pb-Free (RoHS) Available Supply Date	15-Apr-2005	Green Available Supply Date	01-Mar-2007				
Component Information							
Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Component Level	
				Percentage %	ppm	Percentage %	ppm
Bond Wire							
Other Nonferrous Metals and Alloys	Beryllium	7440-41-7	0.000001	0.0007	7	0.0000	0
Other Nonferrous Metals and Alloys	Calcium	7440-70-2	0.000002	0.0014	14	0.0000	0
Precious Metals	Gold	7440-57-5	0.139986	99.9971	999971	0.0974	974
Precious Metals	Palladium	7440-05-3	0.000001	0.0007	7	0.0000	0
Sub-Total			0.139990	100	1000000	0.0974	974
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.081367	69.9997	699997	0.0566	566
Thermoplastics	Epoxy	85954-11-6	0.034872	30.0003	300002	0.0243	242
Sub-Total			0.116239	100	1000000	0.0809	808
Lead Frame							
Copper & Its Alloys	Copper	7440-50-8	24.502388	97.4250	974249	17.0514	170513
Copper & Its Alloys	Iron	7439-89-6	0.603600	2.4000	23999	0.4200	4200
Copper & Its Alloys	Phosphorus	7723-14-0	0.003773	0.0150	150	0.0026	26
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.007545	0.0300	299	0.0053	52
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.007545	0.0300	299	0.0053	52
Zinc & Its Alloys	Zinc	7440-66-6	0.025150	0.1000	999	0.0175	175
Sub-Total			25.150001	100	1000000	17.5021	175018
Lead Frame Plating							
Nickel & Its Alloys	Nickel	7440-02-0	0.047560	95.1200	951199	0.0331	330
Precious Metals	Gold	7440-57-5	0.000390	0.7800	7799	0.0003	2
Precious Metals	Palladium	7440-05-3	0.002050	4.1000	41000	0.0014	14
Sub-Total			0.050000	100	1000000	0.0348	346
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0, 14464-46-1	89.497440	76.0000	759999	62.2819	622818
Other Organic Materials	Proprietary Non Halide Flame Retardant		4.121593	3.5000	35000	2.8682	28682
Other Plastics & Rubber	Carbon Black	1333-86-4	0.359279	0.3000	2999	0.2458	2458
Thermoplastics	Epoxy	85954-11-6	23.787478	20.2000	202000	16.5539	165538
Sub-Total			117.759790	100	1000000	81.9499	819496
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.481342	100.0000	1000000	0.3350	3349
Sub-Total			0.481342	100	1000000	0.3350	3349
Total			143.697362			100	1000000

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BOMCHECK – database for substance information

Founded October 2007 by Siemens, Philips and GE Healthcare

- Industry Steering Group directs the development of new functions and features on BOMcheck
- Industry Substance List Working Group identifies and evaluates substance regulations

Owned, designed and managed by thinkstep.

- Co-Chair of US Standard IPC 1752A for Materials Declarations
- European Regional Coordinator for International Standard IEC 62474 for Materials Declarations.

Suppliers join by completing the on-line registration form and agreeing to comply with the Member Rules

- After 90 day free trial suppliers pay 300 Euros per Authorized Individual per year
- Free-of-charge for small suppliers

Manufacturers join free-of-charge by signing the Standard Manufacturer's Agreement

- To comply with Anti Trust legislation the same Agreement is provided to all Manufacturers



IHS – database for component information

Attributes	Value
Part Status	Active
Description	2 CHANNEL(S), VOLUME CONTROL CIRCUIT, PQFP48
Manufacturer Part Description	12-W STEREO CLASS-D AUDIO POWER AMPLIFIER WITH DC VOLUME CONTROL
Manufacturer Package Description	GREEN, PLASTIC, HTQFP-48
CAGE Code	01295, 33809
Generic	TPA3004D2
EU RoHS Compliant	Yes
China RoHS Compliant	Yes
REACH Compliant	Yes
Life Cycle Stage	Mature
Life Cycle Code	3.5
Availability(YTEOL)	> 8
Estimated YTEOL	8.5
Alert/Prediction Date	14-Dec-2015
Date of Intro	17-Feb-2003
HTS Code	8542.39.00.00
SB Code	8542.39.00.00
ECCN	EAR99
ECCN Governance	EAR
Operating Temperature-Max (Cel)	85
Operating Temperature-Min (Cel)	-40
Number of Channels	2
Supply Voltage-Max (Vsup) (V)	18
Supply Voltage-Min (Vsup) (V)	8.5
Channel Separation (dB)	77
Number of Functions	1
Consumer IC Type	VOLUME CONTROL CIRCUIT
Sub Category	Audio/Video Amplifiers

+ Alerts
Environmental / Material

Docs
EU RoHS
Cn RoHS
REACH
DRC
Mfg
FMD

[IPC 1752A XML](#)

Attributes	Value
Item Number/Name	PHP 48
Item Weight (mg)	218.700000

Homogenous Material	H Mat Weight (mg)	Substance	Symbol	CAS	Weight (mg)
FMD Homogenous Data					
Bond Wire	0.335941	Aluminium	Al	7429-90-5	0.000002
Bond Wire	0.335941	Calcium	Ca	7440-70-2	0.000007
Bond Wire	0.335941	Copper	Cu	7440-50-8	0.335907
Bond Wire	0.335941	Iron	Fe	7439-89-6	0.000002
Bond Wire	0.335941	Proprietary Materials			0.000017
Bond Wire	0.335941	Silver	Ag	7440-22-4	0.000005
Bond Wire	0.335941	Sulfur	S8	7704-34-9	0.000001
Die Attach Adhesive	4.328111	Oxirane, 2,2'-[(3,3',5,5'-tetramethyl[1,1'-biphenyl]-4,4'-diyl)bis(oxyethylene)]bis-		85954-11-6	0.670857
Die Attach Adhesive	4.328111	Silver	Ag	7440-22-4	3.657254
Lead Frame	127.000000	Copper	Cu	7440-50-8	123.850400
Lead Frame	127.000000	Iron	Fe	7439-89-6	2.921000
Lead Frame	127.000000	Phosphorus	P	7723-14-0	0.038100
Lead Frame	127.000000	Tin	Sn	7440-31-5	0.190500
Lead Frame Plating	2.500000	Gold	Au	7440-57-5	0.019500
Lead Frame Plating	2.500000	Nickel	Ni	7440-02-0	2.378000
Lead Frame Plating	2.500000	Palladium	Pd	7440-05-3	0.102500
Mold Compound	71.459380	Carbon Black		1333-86-4	0.214378
Mold Compound	71.459380	Fused Silica			60.740173

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Change history

Issue	Date	Change
1	2016-10-03	First issue.
2	2016-10-28	Changed text in slide 7 regarding interpretation of Annex XIV. Changed wording from products to articles.
3	2020-01-07	New template. Changed text in slides 10 and 11. Removed reference to GMS-0111. New picture in slide 4.