

# Polyethylene BorSafe™ HE3490-LS

## STATEMENT ON CHEMICALS, REGULATIONS AND STANDARDS

We certify, that during manufacturing of this product, we do not use or intentionally incorporate into it, any of the chemicals as restricted by the following regulations and their subsequent amendments in amounts which exceed the applicable limits.

- Annex XVII of the REACH Regulation 1907/2006/EC (superseding Directive 76/769/EEC) – Restrictions on the manufacturing, placing on the market and use of certain dangerous substances, mixtures and articles.
- CONEG “Toxics in Packaging” Model Legislation, rev. 2008 – Sum of Cd, Cr, Hg and Pb < 100 ppm
- Directive 94/62/EC (Packaging and Packaging Waste – PPW) and related EN13428 and CR13695 – Sum of Cd, Cr, Hg and Pb < 100 ppm
- Directive 2000/53/EC (End-of-life vehicles – ELV) – Cr(VI), Hg and Pb < 0.1 wt%, Cd < 0.01 wt%)
- Directive 2011/65/EU (Restriction on the use of certain Hazardous Substances in electrical and electronic equipment – RoHS, repealing 2002/95/EC) – Cr(VI), Hg, Pb, PBB and PBDE < 0.1 wt%, Cd < 0.01 wt%
- Directive 2002/96/EC (Waste Electrical & Electronic Equipment – WEEE) – Annex II – No ingredients used which require selective waste treatment (As, Hg, PCB, PCT, CFC, HCFC, HFC, Brominated FR)
- Chemicals List of Proposition 65 of the State of California and subsequent amendments, as known to the State of California to cause cancer
- Regulation 1005/2009/EC (Marketing and use of Ozone layer depleting substances) – Prohibition of CFC's, HCFC's, Halons, CCl4, Trichloroethane, HBFC's
- US Clean Air Act, Title VI, Classes I and II (EPA Final Rule; Federal Register 8136, 11.2.1993) on substances that deplete the ozone layer
- Regulation 850/2004/EC on Persistent Organic Pollutants (POPs)
- Directive 2003/89/EC, 2006/142/EC, 2007/68/EC amending Directive 2000/13/EC – Annex IIIa (Allergens)
- Global Automotive Declarable Substance List (GADSL) Ed. 1.0 (2013) and VDA232-101 – No use of prohibited or declarable substances above threshold limits
- Swiss SR 814.018 (Verordnung über die Lenkungsabgabe auf flüchtigen organischen Verbindungen – VOCV) – VOC's according to Annexes 1 & 2 < 3 wt%
- Regulation 1223/2009/EC “on cosmetic products” – prohibited and restricted substances
- Directive 2009/48/EC (safety of toys)
- “European Standard EN 71 “Safety of Toys”, Part 3 (1994): “Migration of certain elements” – (Sb < 60; As < 50; Ba < 1000; Cd < 75; Cr < 60; Pb < 90; Hg < 60; Se < 500 mg/kg toy material) and Part 9 (2005) “Organic chemical compounds – Requirements” (none of the substances listed in Tables 2 A-I are intentionally added).
- Japan CSCL; Class I and II Specified Chemical Substances
- Japan CSCL; Priority Assessment Chemical Substances
- Japan PRTR law; Class I and II Designated Chemical Substances

# Polyethylene

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- Japanese Enforcement Order of the Industrial Safety and Health Act, Cabinet Order No. 331 (amendment), Article 16 and Appended Table 3
- Chemical Weapons Convention, Schedule 1 substances (Toxic Chemicals and Precursors)
- Canadian Environmental Protection Act, 1999, Schedule 1 (Toxic Substances List) and Batch 1 – 12 Challenge Substances

Regarding classification of the above product according to Singapore Standard SS 586 : Part 2 : 2008 (Globally Harmonized System of classification and labeling of chemicals – Singapore adaptations), reference is made in the Safety Information Sheet for the above product.

We also certify, that during the manufacturing of the above product, we do not use or intentionally incorporate into it any of the following materials:

Acrylamide  
 Alkylphenols or Alkylphenoethoxylates; TNPP  
 Antimony, Arsenic, Beryllium, Bismuth and its compounds  
 Aromatic Amines (restricted in Regulation 1907/2006/EC, Annex XVII)  
 Artificial Musk  
 Asbestos  
 Azocolorants (restricted in Regulation 1907/2006/EC, Annex XVII)  
 Azodicarbonamide, semicarbazide  
 Benzophenones (e.g. 4-MBP, 4-HBP, 2,2'-Dimethoxy-2-phenylacetophenone)  
 BHA or BHT  
 Biocides (Pesti-, Herbi-, Insecti-, Fungi-, Bactericides)  
 Bisphenols and its compounds (e.g. NOGE, BFDGE, BADGE)  
 Brominated flame retardants (e.g. PBB, PBDE)  
 Cadmium, Chromium (VI), Lead, Mercury and its compounds  
 CFC, HCFC  
 CMR substances Categories 1A, 1B or 2 according to Regulation 1272/2008/EC  
 Colophony (rosin)  
 Chlorophenols (e.g. Pentachlorophenol (PCP), 2,4,5-trichlorophenol, 6-chloro-O-cresol and derivatives)  
 Citrates (e.g. Triethyl citrate, Tributyl citrate, ATEC, ATBC)  
 4,4'-Diaminodiphenylmethane (MDA)  
 Di-2-ethyl-hexyl maleate (DEHM)  
 Dimethylfumarate (DMF), Dibutylfumarate  
 Dioxins and furans  
 Endocrine disruptors: Category 1 substances in the European Commission EDS database  
 2-Ethylhexanoic acid, Ethoxyquin, ITX, Thiuram  
 Formaldehyde  
 Fragrances  
 Furfural  
 Genetically modified materials (GMO)  
 Glycol ethers (EGME, EGMEA, EGEE, EGEEA)  
 Gold, Indium, Nickel, Palladium and its compounds  
 Halogenated organic compounds  
 Melamine, Cyanuric acid  
 Natural rubbers, Latex  
 Nitrosamines  
 Organotin compounds  
 Parabens  
 PBT and vPvB substances according to EC Regulation No. 1907/2006 (REACH)  
 Perfluorinated tensides - PFT (e.g. PFOA, PFOS)  
 Plasticisers (e.g. Adipates, ESBO, Phthalates)  
 Polychlorinated Bi-, Terphenyls and Naphthalenes (PCBs / PCTs / PCNs)

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Polycyclic aromatic hydrocarbons (PAH)  
Radioactive substances  
Recycled Materials  
Selenium, Silver, Tantalum, Tellurium, Thorium, Tin, Tungsten, Vanadium and its compounds  
Styrene  
SVHC on "Candidate List of Substances of Very High Concern for Authorisation"  
UV-hardeners (e.g. ITX, Titanyl-acetylacetone)  
Vinylchloride, Vinylidenechloride, PVC or PVDC

The substances used in the manufacturing of the above product, and – so far covered – the basic polymer(s), are listed in the following chemical inventories:

Australia / AICS  
Canada / DSL  
China / IECSC  
Europe / EINECS or ELINCS or NLP  
Japan / ENCS  
Korea / KECI  
New Zealand / NZIoC  
Philippines / PICCS  
USA / TSCA

Prepared by: Product Stewardship Specialist  
Date prepared: 02/11/2013  
Document No.: HSE-CS-059  
Rev. No.: 4

#### For more information:

Website [www.borouge.com](http://www.borouge.com) | Email [product.stewardship@borouge.com](mailto:product.stewardship@borouge.com)

#### Disclaimer

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# Polyethylene BorSafe™ HE3490-LS

## STATEMENT ON COMPLIANCE TO REGULATIONS FOR DRINKING WATER PIPES

We confirm that this product and the monomers, additives and (if present) pigments used for its manufacturing are in compliance with the requirements of the following legislation:

Austria	Kunststoffverordnung Nr. 476/2003 und Änderungen 242/2005, 452/2006, 325/2007, 140/2009, 196/2010 und 45/2011
The Czech Republic	Vyhlasaka Ministerstva zdravotnictvi c. 409/2005 Sb.
Denmark	Fødevaredirektoratets Bekendtgørelse nr. 167 (03.03.2009)
EU	Regulation (EC) No 1935/2004 – so far applicable to polymer pellets Commission Regulation (EU) 2011/10 as amended Commission Regulation (EC) 1895/2005 – BADGE, NOGE and BFDGE are not used for the production of this grade
Finland	KTM Asetukset 953/2002, 141/2005, 181/2005, 762/2006, 1065/2007, 107/2009 ja 106/2011
France	Repression des Fraudes (2002), No 1227, et Arrêté du 2 janvier 2003, Arrêté du 29 mars 2005, Arrêté du 9 août 2005, Arrêté du 19 octobre 2006, Arrêté du 25 avril 2008, Arrêté du 19 novembre 2008 et Arrêté du 03 septembre 2010
Germany	Bedarfsgegenständeverordnung vom 23.12.1997 in der Fassung vom 11.10.2010, sowie Empfehlung des Umweltbundesamtes: Leitlinie zur hygienischen Beurteilung von organischen Materialien in Kontakt mit Trinkwasser (KTW-Leitlinie), Tabelle 1 "Kunststoffe", Stand: 07.10.2008
Italy	Decreto Ministeriale 06.04.2004 N. 174
The Netherlands	Staatstoelicht op de Volksgezondheid, Publikatie 94-01, Deel B, 1.2. Polyetheen
Norway	Sosial- og helsedepartementets forskrift 1993-12-21-1381
Spain	Real Decreto 118/2003, R.D.1262/2005, SCO/3508/2006 y ANAIP (1982), Anexo 1, Anexo 4
Sweden	Statens Livsmedelsverks kungörelse LIVSFS 2003:2 as amended (latest amendment LIVSFS 2011:2)
Switzerland	Verordnung der EDI über Bedarfsgegenstände vom 23.11.2005 (817.023.21); Stand 01.04.2010, 3. Abschnitt Bedarfsgegenstände aus Kunststoff
National approvals	This statement is no warranty, that articles, made from this material and intended to be used in contact with drinking water, will fit the technical requirements as defined in the approval schemes of the above listed countries.

Materials and articles intended to be used in contact with drinking water in many countries have to be approved by authorised national laboratories. For that purpose Borouge is prepared to provide those laboratories detailed information on the composition of this grade on request.

Prepared by: Product Stewardship Specialist  
Date prepared: 27/06/2011  
Document No.: HSE-CS-046  
Rev. No.: 2

# Polyethylene BorSafe HE3490-LS

For more information:

Website [www.borouge.com](http://www.borouge.com) | Email [product.stewardship@borouge.com](mailto:product.stewardship@borouge.com)

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## POLYETHYLENE

# BorSafe™ HE3490-LS

## BLACK BIMODAL PE100 POLYETHYLENE FOR PRESSURE PIPE

### DESCRIPTION

**BorSafe HE3490-LS** is a black, bimodal, high density polyethylene classified as a MRS 10.0 material (PE100) produced by the advanced Borstar technology. Well dispersed carbon black gives outstanding UV resistance. Long term stability is ensured by an optimised stabilisation system.

### APPLICATIONS

**BorSafe HE3490-LS** is recommended for pressure pipe systems in the applications field of drinking water and natural gas, pressure sewerage, relining, sea outfall and industrial. It is especially designed for the production of larger diameter, thick wall pipe, but can be processed for the whole range of diameters. It also shows excellent resistance to rapid crack propagation and slow crack growth.

### PHYSICAL PROPERTIES

		Typical Value*	Unit	Test Method
Density	(Base resin)	949	kg/m <sup>3</sup>	ISO 1183/ISO 1872-2B
Density	(Compound)	959	kg/m <sup>3</sup>	ISO 1183/ISO 1872-2B
Melt Flow Rate	(190°C/2.16 kg)	<0.1	g/10 min	ISO 1133
Melt Flow Rate	(190°C/5.0 kg)	0.25	g/10 min	ISO 1133
Tensile Stress at Yield	(50 mm/min)	25	Mpa	ISO 527-2
Tensile Strain at Break		>600	%	ISO 527-2
Tensile Modulus	(1 mm/min)	1100	MPa	ISO 527-2
Charpy Impact, notched	(0°C)	16	kJ/m <sup>2</sup>	ISO 179/1eA
Hardness, Shore D		60	-	ISO 868
Carbon Black Dispersion		<3		ISO 18553
Carbon Black content		>2	%	ASTM D 1603/ISO 6964
Brittleness Temperature		<-70	°C	ASTM D 746
Resistance to Rapid Crack Propagation, S4 test	(Pc at 0°C, test pipe 250mm SDR11)	>10	bar	ISO 13477
Resistance to Slow Crack Growth	(9.2bar, 80°C)	>1000	h	ISO 13479
Thermal Stability	(210°C)	>20	min	EN 728
ESCR	(10% Igepal), F <sub>50</sub>	>10000	h	ASTM D 1693-A

\* Data should not be used for specification work.

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**Borouge Pte Ltd** 1 George Street | #18-01 | Singapore 049145  
Tel +65 6275 4100 | Fax +65 6377 1233 |  
www.borouge.com  
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### PROCESSING GUIDELINES

#### Pre-drying

Due to the hygroscopic nature of carbon black, this compound is sensitive to moisture. Storage for a long time or under unfavourable conditions will increase the moisture content. For normal conditions and applications we suggest preheating and drying for minimum 1 hour with a maximum preheat temperature of 90°C.

#### Extrusion

The actual extrusion conditions will depend on the type of equipment used. They will also depend on size and wall thickness of the pipe produced. The following conditions may be used as a guideline when starting up the extruder:

Cylinder	190 . 210°C
Head	200 . 210°C
Die	200 . 210°C
Melt temperature	200 . 220°C

Specific recommendations for processing conditions can be determined only when the application and type of equipment are known. Please contact your local Borouge representative for such particulars.

### STORAGE AND HANDLING

**BorSafe HE3490-LS** should be stored in dry conditions at temperatures below 50°C and protected from UV-light.

Improper storage can initiate degradation, which results in odour generation and can have negative effects on the physical properties of the product.

### SAFETY

**BorSafe HE3490-LS** is not classified as dangerous preparation.

Dust and fines from the product carry a risk of dust explosion. All equipment should be properly earthed. Inhalation of dust should be avoided as it may cause irritation of the respiratory system. Small amounts of fumes are generated during processing of the product. Proper ventilation is therefore required.

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### RECYCLING

The product is suitable for recycling using modern methods of shredding and cleaning. In-house production waste should be kept clean to facilitate direct recycling.

A Safety Information Sheet is available on request. Please contact your Borouge representative for more details on various aspects of safety, recovery and disposal of the product.

### RELATED DOCUMENTS

The following related documents are available on request, and represent various aspects on the usability, safety, recovery and disposal of the product:

Recovery and disposal of Polyolefins  
Information on Emissions from Processing and Fires  
Safety Information Sheet, SIS

Liability statements on:

- Compliance to Food Contact Regulations
- Compliance to Regulations for Drinking Water Pipes
- Statement on chemical, regulations and standards

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November 2013

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[www.borouge.com](http://www.borouge.com)  
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# Polyethylene BorSafe™ HE3490-LS

## 1. IDENTIFICATION

Product name: BorSafe HE3490-LS  
 Intended use: Raw material for plastic industry.  
 Manufacturer: Abu Dhabi Polymers Co. Ltd (Borouge)  
 Address: P. O. Box 11764, Ruwais, U. A. E.  
 Telephone: +9712 6020600  
 Facsimile: +9712 6020771  
 Supplier: Borouge Pte Ltd  
 Address: 1 George Street, #18-01, Singapore 049145  
 Telephone: +65 6275 4100  
 Facsimile: +65 6377 1233  
 Email: info@borouge.com

## 2. HAZARDS IDENTIFICATION

### GHS classification

Physical: No classification.  
 Health: No classification.  
 Environmental: No classification.  
 Other hazards: Inhalation of dust may irritate the respiratory tract. Prolonged inhalation of high doses of decomposition products may give headache or irritation of the respiratory tract.  
 Dust from the product (when mixed with air in critical proportions and in the presence of an ignition source) may present a dust explosion hazard.

### GHS label elements

Pictograms: Nil.  
 Signal word: Nil.  
 Hazard statements: Nil.  
 Precautionary statements: Nil.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

The product is a Polyethylene polymer.  
 Contains no substance classified as hazardous in concentrations, which should be taken into account according to Singapore Standard SS 586 : Part 2 : 2008 (Globally Harmonized System of classification and labeling of chemicals – Singapore adaptations).

## 4. FIRST AID MEASURES

Inhalation: If experiencing respiratory symptoms: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice / attention.  
 Skin contact: Cool molten product on skin with plenty of water.  
 Do not remove solidified product.  
 Eye contact: No specific instruction needed.  
 Ingestion: No specific instruction needed.

# Polyethylene BorSafe HE3490-LS

## 5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Water in spread jet, dry chemicals, foam or Carbon Dioxide.
Specific hazards during fire fighting:	Product will burn under fire conditions. Dust from the product (when mixed with air in critical proportions and in the presence of an ignition source) may present a dust explosion hazard. Principal toxicant in the smoke is Carbon Monoxide.
Special protective actions for fire fighters:	Fire fighters should wear self-contained breathing apparatus, boots, gloves, goggles and full protective clothing. Extinguish from the upwind direction.

## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency measures:	NO flames, NO sparks. Eliminate all sources of ignition. Avoid breathing dust. Use personal protective equipment as required. Refer to Section 8: Exposure Controls / Personal Protection.
Methods for cleaning up:	Suck or sweep up spill. All spill of material must be removed immediately to prevent slipping accidents.

## 7. HANDLING AND STORAGE

Handling:	During processing and thermal treatment of the product, small amounts of volatile hydrocarbons may be released. Provide adequate ventilation. Local exhaust ventilation may be necessary. Avoid inhalation of dust and decomposition fumes. Dust from the product gives a potential risk for dust explosion. Avoid the formation or spread of dust in the atmosphere. Avoid the build-up of dust. Clean regularly. Ground / bond container and receiving equipment. Take precautionary measures against static discharge.
Storage:	The product should be stored in dry conditions at temperatures below 50 °C and protected from UV-light.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	Basis	Control parameters / Occupational exposure limits
Inhalable dust:	USA / ACGIH	TLV-TWA: 10 mg/m <sup>3</sup>
	UK HSE EH40/2005	8 hr TWA: 10 mg/m <sup>3</sup>
Respirable dust:	USA / ACGIH	TLV-TWA: 3 mg/m <sup>3</sup>
	UK HSE EH40/2005	8 hr TWA: 4 mg/m <sup>3</sup>

Engineering controls:	Extraction to remove dust at its source. Provide adequate ventilation. Local exhaust ventilation may be necessary.
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# Polyethylene

## BorSafe HE3490-LS

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid, black	Melting point / range:	100 – 140 °C
Odour:	Odourless	Ignition temperature:	> 320 °C
Density:	0.9 – 1.0 g/cm <sup>3</sup>	Solubility in water:	Insoluble in water

### 10. STABILITY AND REACTIVITY

Chemical stability:	The product is a stable thermoplastic.
Reactivity:	No chemical reactivity.
Conditions to avoid:	Dusty conditions, heat, open flame, spark, static electricity.
Incompatible materials:	Nil.
Hazardous decomposition products:	On combustion releases: Oxides of Carbon.

### 11. TOXICOLOGICAL INFORMATION

The product is not classified as a hazardous mixture according to Singapore Standard SS 586 : Part 2 : 2008 (Globally Harmonized System of classification and labeling of chemicals – Singapore adaptations).  
However, inhalation of dust may irritate the respiratory tract. Prolonged inhalation of high doses of decomposition products may give headache or irritation of the respiratory tract.

### 12. ECOLOGICAL INFORMATION

The product is not classified as hazardous to the environment according to Singapore Standard SS 586 : Part 2 : 2008 (Globally Harmonized System of classification and labeling of chemicals – Singapore adaptations).

### 13. DISPOSAL CONSIDERATIONS

Reuse or recycle if not contaminated. The product may be safely used as fuel or land filled. Proper combustion does not require any special flue gas control. No leachate is generated in landfills. Check with local regulations.

### 14. TRANSPORT INFORMATION

Land (RID / ADR):	Not regulated.
Sea (IMO / IMDG):	Not regulated.
Air (ICAO-IATA):	Not regulated.

### 15. REGULATORY INFORMATION

Chemical inventory	Status
Australia / AICS:	Y
Canada / DSL:	Y
China / IECSC:	Y

# Polyethylene

## BorSafe HE3490-LS

China / IECSC:	Y
Europe / EINECS or ELINCS or NLP:	P
Japan / ENCS:	Y
Korea / KECI:	Y
New Zealand / NZIoC:	Y
Philippines / PICCS:	Y
USA / TSCA:	Y

- Y = All ingredients are on the inventory.  
 E = All ingredients are on the inventory or exempt from listing.  
 P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.  
 N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

### 16. OTHER INFORMATION

Reasons for revision: Changes and / or additions made to Sections 1, 2, 4, 5, 6, 7, 8 and 10.

Prepared by: Product Stewardship Specialist  
 Date prepared: 11/07/2011  
 Document No.: HSE-SIS-018  
 Rev. No.: 2

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