SAFETY DATA SHEET

1. Identification

Product identifier **RELVAR (ROW)/ BREO (US) ELLIPTA**

Other means of identification Not available.

Synonym(s) RELVAR ELLIPTA * BREO ELLIPTA * FLUTICASONE FUROATE/VILANTEROL ELLIPTA * FLUTICASONE FUROATE/VILANTEROL INHALATION POWDER * FLUTICASONE FUROATE/VILANTEROL INHALATION POWDER (50/25MCG) * FLUTICASONE FUROATE/VILANTEROL INHALATION POWDER (100/25MCG)

Recommended use Medicinal Product

This safety data sheet is written to provide health, safety and environmental information for people handling this formulated product in the workplace. It is not intended to provide information relevant to medicinal use of the product. In this instance patients should consult prescribing information/package insert/product label or consult their pharmacist or physician. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate safety data sheet for each ingredient.

Recommended restrictions No other uses are advised.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

GlaxoSmithKline US
5 Moore Drive
Research Triangle Park, NC 27709 USA
US General Information (normal business hours): +1-888-825-5249
Email Address: msds@gsk.com
Website: www.gsk.com
EMERGENCY PHONE NUMBERS -
TRANSPORT EMERGENCIES (by country / geographic region):

Africa / EU / Israel / Middle East (English / European languages):	+44 (0) 1235 239 670
Asia Pacific (except China):	+65 3158 1074
China:	+86 10 5100 3039
Middle East / Africa (Arabic-speaking countries):	+44 (0) 1235 239 671
US:	+1 703 527 3887

available 24 hrs/7 days; multi-language response

2. Hazard(s) identification

Classified hazards

Exempt from requirements - product regulated as a medicinal product, cosmetic product or medical device.

Label elements

Exempt from requirements - product regulated as a medicinal product, cosmetic product or medical device.

Hazard(s) not otherwise classified (HNOC)

Exempt from requirements - product regulated as a medicinal product, cosmetic product or medical device.

3. Composition/information on ingredients

Mixtures

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
FLUTICASONE FUROATE	GW685698X FURAN-2-CARBOXYLIC ACID 6,9-DIFLUORO-17-FLUOROMETHYLSULFA 3-OXO-6,7,8,9,10,11,12,13,14,15,16,17-DOD ESTER 2080 (GW ACN) (6ALPHA,11BETA,16ALPHA,17ALPHA)-6,9-I 2-FURANCARBOXYLATE	397864-44-7	0.4 - 3.2

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
MAGNESIUM STEARATE	OCTADECANOIC ACID, MAGNESIUM SALT STEARIC ACID, MAGNESIUM SALT MAGNESIUM DISTEARATE DIBASIC MAGNESIUM STEARATE MAGNESIUM DISTEARATE, PURE OCTADECANOIC ACID MAGNESIUM SALT MAGNESIUM OCTADECANOATE C36H70MGO4 OHS13505 RTECS WI4390000 MAGNESIUMDISTEARAT	557-04-0	1
VILANTEROL	VILANTEROL (ALPHA1-R)-ALPHA1-[[[6-[2-[(2,6-DICHLOR(TRIPHENYLACETIC ACID SALT GW642444 TRIPHENYLACETIC ACID SALT	503070-58-4	0.1 - 0.4
Other components below reportable levels			>95.0

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact Rinse with water. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed The following adverse effects have been noted with therapeutic use of this material: increased susceptibility to infection; changes in clinical chemistry parameters; headache; inflamed nasal cavity; back pain; changes in blood pressure; altered heart rate and pulse; pain; coughing.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically.

General information If you feel unwell, seek medical advice (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder.

Unsuitable extinguishing media Carbon dioxide (CO2).

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire-fighting equipment/instructions In the event of fire, cool tanks with water spray. Water runoff can cause environmental damage.

Specific methods Cool containers exposed to flames with water until well after the fire is out.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the MSDS.

Methods and materials for containment and cleaning up Stop the flow of material, if this is without risk. Collect spillage. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For waste disposal, see section 13 of the MSDS.

Environmental precautions Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid release to the environment. Do not empty into drains.

Conditions for safe storage, including any incompatibilities Store in a cool, dry place out of direct sunlight. Store away from incompatible materials (see Section 10 of the MSDS).

8. Exposure controls/personal protection

Occupational exposure limits

GSK

Components	Type	Value	Note
FLUTICASONE FUROATE (CAS 397864-44-7)	8 HR TWA	6 mcg/m3	
	OHC	4	REPRODUCTIVE HAZARD
		4	SKIN
MAGNESIUM STEARATE (CAS 557-04-0)	OHC	1	
VILANTEROL (CAS 503070-58-4)	15 MIN STEL	20 mcg/m3	
	8 HR TWA	2 mcg/m3	
	ADE	5 µg/day	
	OHC	4	

US. ACGIH Threshold Limit Values

Components	Type	Value
MAGNESIUM STEARATE (CAS 557-04-0)	TWA	10 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection For prolonged or repeated skin contact use suitable protective gloves. The selection of gloves for a specific activity must be based on the material's properties and on possible permeation and degradation that may occur under the circumstances of use. Glove selection must take into account any solvents and other hazards present. Care must be exercised if insufficient data are available and further guidance should be sought from your local EHS department. Potential allergic reactions can occur with certain glove materials (e.g. Latex) and therefore these should be avoided.

Other Wear suitable protective clothing.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Solid.

Form Dry powder.Inhaler.

Color Not available.

Odor Not available.

Odor threshold Not available.

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	None known.
Hazardous decomposition products	Irritating and/or toxic fumes and gases may be emitted upon the products decomposition.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Health injuries are not known or expected under normal use.
Inhalation	Health injuries are not known or expected under normal use.
Skin contact	Health injuries are not known or expected under normal use.
Eye contact	Health injuries are not known or expected under normal use.
Symptoms related to the physical, chemical and toxicological characteristics	The following adverse effects have been noted with therapeutic use of this material: increased susceptibility to infection; changes in clinical chemistry parameters; headache; inflamed nasal cavity; back pain; changes in blood pressure; altered heart rate and pulse; pain; coughing.

Information on toxicological effects

Acute toxicity Health injuries are not known or expected under normal use.

Components	Species	Test Results
FLUTICASONE FUROATE (CAS 397864-44-7)		
Acute		
Inhalation		
LCLo	Rat	> 0.133 mg/l
Oral		
LD50	Mouse	> 2000 mg/kg
	Rat	> 2000 mg/kg
Subacute		
Inhalation		
LOEL	Dog	<= 10.4 mg/kg/day, 4 weeks, Pharmacological effects
		<= 9 mg/kg/day, 4 weeks, Pharmacological effects
	Rat	<= 6.9 mg/kg/day, 4 weeks, Pharmacological effects
Subchronic		
Inhalation		
LOEL	Dog	<= 13 mcg/kg/day, 39 weeks, Pharmacological effects

Components	Species	Test Results
		<= 11 mcg/kg/day, 13 weeks, Pharmacological effects
	Mouse	<= 7 mcg/kg/day, 13 weeks, Pharmacological effects
	Rat	<= 24 mcg/kg/day, 13 weeks, Pharmacological effects
		<= 20 mcg/kg/day, 26 weeks, Pharmacological effects
MAGNESIUM STEARATE (CAS 557-04-0)		
Acute		
Oral		
LD50	Rat	> 2000 mg/kg
VILANTEROL (CAS 503070-58-4)		
Acute		
Oral		
LD		> 300 mg/kg
Subchronic		
Inhalation		
NOAEL	Dog	62.5 mcg/kg/day, 39 weeks, heart, respiratory tract irritation
		9.3 mcg/kg/day, 13 weeks, heart, respiratory tract irritation
	Mouse	38200 mcg/kg/day, 13 weeks, clinical signs, mortality
	Rat	658 mcg/kg/day, 13 weeks, respiratory tract irritation
		58 mcg/kg/day, 26 weeks, respiratory tract irritation
NOEL	Dog	< 9.3 mcg/kg/day, 13 weeks, adrenergic effects
		< 9.55 mcg/kg/day, 39 weeks, adrenergic effects
	Mouse	< 59 mcg/kg/day, 13 weeks, adrenergic effects
	Rat	< 56 mcg/kg/day, 13 weeks, adrenergic effects
		< 58 mcg/kg/day, 26 weeks, adrenergic effects

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Health injuries are not known or expected under normal use.

Corrosivity

FLUTICASONE FUROATE	OECD 404 Result: Negative Species: Rabbit
VILANTEROL	Reconstituted Human Epidermis Result: Negative

Irritation Corrosion - Skin: P.I.I. value

MAGNESIUM STEARATE	0

Serious eye damage/eye irritation Not available.

Respiratory sensitization Due to lack of data the classification is not possible.

Skin sensitization Not available.

Sensitization

VILANTEROL	50 % OECD 429, Vehicle - Dimethyl formamide Result: Negative
FLUTICASONE FUROATE	Read across, Fluticasone propionate Result: Negative Species: Guinea pig

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

VILANTEROL	ICH S 2 (R1) Result: Negative
VILANTEROL	ICH S 2 (R1) Result: Negative
FLUTICASONE FUROATE	Ames Result: Negative Chromosomal aberration assay Result: Negative
VILANTEROL	L5178Y mouse lymphoma thymidine kinase locus assay, GW642444H Result: Negative L5178Y mouse lymphoma thymidine kinase locus assay, GW642444H, DNA damage occurred only at cytotoxic concentrations. Result: Positive
FLUTICASONE FUROATE	Mouse Lymphoma Cell (L5178Y) Assay Result: Negative Rat Micronucleus Assay Result: Negative
VILANTEROL	Rat UDS assay, GW642444H Result: Negative Syrian Hamster Embryo (SHE) cell transformation assay, GW642444H Result: Negative bacterial mutation assay (high throughput fluctuation test), GW642444H Result: Negative

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Not classifiable as to carcinogenicity to humans.

VILANTEROL	> 10.5 mcg/kg/day ICH S1B - Inhalation, NOAEL Result: Negative Species: Rat Test Duration: 104 weeks > 6.4 mcg/kg/day ICH S1B - Inhalation, NOAEL Result: Negative Species: Mouse Test Duration: 104 weeks > 62 mcg/kg/day ICH S1B - Inhalation, Species-specific Result: Positive Species: Mouse Organ: Uterus/ Ovary Test Duration: 104 weeks > 84.4 mcg/kg/day ICH S1B - Inhalation, Species-specific Result: Positive Species: Rat Organ: Pituitary/ Ovary Test Duration: 104 weeks
FLUTICASONE FUROATE	ICH S1B - Inhalation Result: Negative Species: Mouse ICH S1B - Inhalation Result: Negative Species: Rat

Reproductive toxicity Components in this product have been shown to cause birth defects and reproductive disorders in laboratory animals.

VILANTEROL	30 mcg/kg/day S5(R2) Sub-cutaneous, NOAEL Result: Negative Species: Rabbit 300 mcg/kg/day S5(R2) Sub-cutaneous Result: Positive Species: Rabbit Organ: Eye 300 mcg/kg/day S5(R2) Sub-cutaneous Result: Positive Species: Rabbit Organ: Skeleton > 33700 mcg/kg/day S5(R2) Result: Negative Species: Rat

VILANTEROL	> 33700 mcg/kg/day ICH S5(R2), Inhalation Result: Negative Species: Rat
FLUTICASONE FUROATE	8 mcg/kg/day Embryofetal Development Result: NOAEL Species: Rabbit 91 mcg/kg/day Female Fertility / Early Embryonic Development Result: reduced foetal bodyweight, minor skeletal variations Species: Rat >= 47 mcg/kg/day Embryofetal Development Result: Maternal weight loss/ Foetal abortion Species: Rabbit Male Fertility Result: No effect Species: Rat

Specific target organ toxicity - single exposure Heart.

Specific target organ toxicity - repeated exposure Immune system. Adrenal glands. Bone tissue.

Aspiration hazard Due to lack of data the classification is not possible.

Further information Caution - Pharmaceutical agent.

12. Ecological information

Ecotoxicity Contains a substance which causes risk of hazardous effects to the environment.

Components		Species	Test Results
FLUTICASONE FUROATE (CAS 397864-44-7)			
Acute			
	NOEC	Activated sludge	1000, 3 hours, Nominal
Other	IC50	Activated sludge of a predominantly domestic sewage	> 1000 mg/l, 3 hours, Nominal
Aquatic			
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	> 4.2 mg/l, 48 hours, Static renewal test
	NOEC	Water flea (Daphnia magna)	4.2 mg/l, 48 hours, Static renewal test
Terrestrial			
Acute			
Earthworm	EC50	Manure worm (Eisenia foetida)	> 1000 mg/kg, 14 days, Measured
	NOEC	Manure worm (Eisenia foetida)	1000 mg/kg, 14 days
MAGNESIUM STEARATE (CAS 557-04-0)			
Aquatic			
Acute			
Fish	EC50	Orange-red killfish (Adult Oryzias latipes)	130 mg/l, 96 hours
Microtox	EC50	Microtox	12.5 mg/l, 15 minutes
VILANTEROL (CAS 503070-58-4)			
Aquatic			
Acute			
Algae	EC50	Green algae (Pseudokirchnereilla subcapitata)	1.33 mg/l, 72 hours, Nominal
	NOEC	Algae	0.139 mg/l, 72 hours
Chronic			
Crustacea	LOEC	Water flea (Daphnia magna)	18.25 mg/l, 21 days, semi-static test conditions
	NOEC	Daphnia	9.125 mg/l, 21 days
Fish	Growth test LOEC	Fathead minnow (Juvenile Pimephales promelas)	1.62 mg/l, 28 days, Nominal

Components	Species	Test Results
Growth test NOEC	Fish	0.54 mg/l, 28 days

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Photolysis

Half-life (Photolysis-atmospheric)

MAGNESIUM STEARATE	17 Hours Estimated

UV/visible spectrum wavelength

MAGNESIUM STEARATE	210 nm

Biodegradability

Percent degradation (Aerobic biodegradation-soil)

FLUTICASONE FUROATE	2 - 3 %, 64 days, Soil
MAGNESIUM STEARATE	50 %, 13 days

Bioaccumulative potential No data available for this product.

Partition coefficient n-octanol / water (log Kow)

VILANTEROL	1.39
FLUTICASONE FUROATE	2.61 (Measured).

Bioconcentration factor (BCF)

MAGNESIUM STEARATE	> 9999 Estimated

Mobility in soil

Adsorption

Soil/sediment sorption - log Koc

FLUTICASONE FUROATE	3.6 - 4.2 Measured
MAGNESIUM STEARATE	5.86 Estimated

Mobility in general

Distribution

Octanol/water distribution coefficient log DOW

VILANTEROL	0.09 Measured., pH 5 1.35 Measured., pH 7 1.39 Measured., pH 9

Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as a dangerous good.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code MARPOL Annex II applies to liquids used in a ship's operation that pose a threat to the marine environment. These materials may not be transported in bulk.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

SARA 304 Emergency release notification

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	No

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

DEA Essential Chemical Code Number

Not regulated.

Food and Drug Administration (FDA)	Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Not regulated.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-15-2013
Revision date	05-15-2013
Version #	02
Further information	Not available.
References	GSK Hazard Determination
Disclaimer	The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create any warranty, express or implied. It is the responsibility of the user to determine the applicability of this information and the suitability of the material or product for any particular purpose.
Revision Information	Product and Company Identification: Business Units Composition / Information on Ingredients: Ingredients Transport Information: Agency Name, Packaging Type, and Transport Mode Selection Regulatory Information: United States GHS: Classification