

### SECTION 1: IDENTIFICATION

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Myrbetriq™ (mirabegron) extended-release Tablets

**Material Name:** mirabegron, YM178

**CAS No:** 223673-61-8

**Chemical Formula of Active Ingredient:** C<sub>21</sub>H<sub>24</sub>N<sub>4</sub>O<sub>2</sub>S

**Chemical Name of Active Ingredient:** 2-(2-Amino-1,3-thiazol-4-yl)-N-[4-(2-[[[(2R)-2-hydroxy-2-phenylethyl]amino]ethyl]phenyl]acetamide

#### 1.2. Intended Use of the Product

**Use of the substance/mixture:** The treatment of overactive bladder (OAB) with symptoms of urge urinary incontinence, urgency, and urinary frequency. For professional use only.

#### 1.3. Name, Address, and Telephone of the Responsible Party

##### Company

Astellas US LLC  
2375 Waterview Drive  
Northbrook, IL 60062  
Tel.: 800-888-7704  
[www.us.astellas.com](http://www.us.astellas.com)

#### 1.4. Emergency Telephone Number

**Emergency Number** : 800-727-7003 Medical Communications

### SECTION 2: HAZARDS IDENTIFICATION

*This product is a drug, as defined by the US Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) It is in solid, final form for direct administration to the patient. Therefore, it is exempt from the US 2012 Hazard Communication Standard, as defined in the 29 CFR 1910.1200(b)(5)(iii).*

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

*This product is a drug, as defined by the US Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) It is in solid, final form for direct administration to the patient. Therefore, it is exempt from the US 2012 Hazard Communication Standard, as defined in the 29 CFR 1910.1200(b)(5)(iii).*

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

**First-aid Measures After Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Gently wash with plenty of soap and water followed by rinsing with water for at least 15 minutes. Call a POISON CENTER or doctor/physician if you feel unwell. Wash contaminated clothing before reuse.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking, or redness persist.

**First-aid Measures After Ingestion:** Do not induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Pharmaceutical. When handling in workplace settings, in quantities that are most likely above the therapeutic dose, this product may be harmful if absorbed through the eyes, skin, or respiratory tract.

**Symptoms/Injuries After Inhalation:** If tablet is crushed: May cause respiratory irritation.

**Symptoms/Injuries After Skin Contact:** May cause an allergic skin reaction.

**Symptoms/Injuries After Eye Contact:** If tablet is crushed: May cause eye irritation.

**Symptoms/Injuries After Ingestion:** May be harmful if swallowed.

**Chronic Symptoms:** Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure.

#### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

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

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### SECTION 5: FIRE-FIGHTING MEASURES

#### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Water spray, fog. Alcohol-resistant foam. Dry chemical.

**Unsuitable Extinguishing Media:** Do not use carbon dioxide. Do not use a heavy water stream. Use of heavy stream of water may spread fire.

#### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not considered flammable but may burn at high temperatures.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

#### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other Information:** Refer to Section 9 for flammability properties.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Use only as directed.

##### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

##### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

#### 6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

#### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain and collect as any solid.

**Methods for Cleaning Up:** Clean up spills immediately and dispose of waste safely. Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Contact competent authorities after a spill.

#### 6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

### SECTION 7: HANDLING AND STORAGE

#### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed:** Avoid breaking or crushing tablets.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

#### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

**Incompatible Products:** Strong oxidizers.

#### 7.3. Specific End Use(s)

The treatment of overactive bladder (OAB) with symptoms of urge urinary incontinence, urgency, and urinary frequency. For professional use only.

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

2,6-Di-tert-butyl-p-cresol (128-37-0)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Iron oxide (Fe <sub>2</sub> O <sub>3</sub> ) (1309-37-1)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (respirable fraction)

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<b>USA ACGIH</b>	ACGIH chemical category	Not Classifiable as a Human Carcinogen
<b>USA NIOSH</b>	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (dust and fume)
<b>USA IDLH</b>	US IDLH (mg/m <sup>3</sup> )	2500 mg/m <sup>3</sup> (dust and fume)
<b>USA OSHA</b>	OSHA PEL (TWA) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (fume) 15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable fraction)

## 8.2. Exposure Controls

### Appropriate Engineering Controls

: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

### Personal Protective Equipment

: Gloves.



### Materials for Protective Clothing

: Chemically resistant materials and fabrics.

### Hand Protection

: Wear chemically resistant protective gloves.

### Eye Protection

: Chemical goggles or safety glasses.

### Skin and Body Protection

: Wear suitable protective clothing.

### Respiratory Protection

: None required under normal product handling conditions. Use NIOSH-approved dust mask if dust has the potential to become airborne.

### Environmental Exposure Controls

: Do not allow the product to be released into the environment.

### Consumer Exposure Controls

: Do not eat, drink or smoke during use.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

#### Physical State

: Solid

#### Appearance

: **25 mg:** oval, brown, film coated tablet, debossed with the (Astellas logo) and "325"

**50 mg:** oval, yellow, film coated tablet, debossed with the (Astellas logo) and "355"

#### Odor

: No data available

#### Odor Threshold

: No data available

#### pH

: No data available

#### Evaporation Rate

: No data available

#### Melting Point

: 144 °C (291.2 °F)

#### Freezing Point

: No data available

#### Boiling Point

: No data available

#### Flash Point

: No data available

#### Auto-ignition Temperature

: No data available

#### Decomposition Temperature

: No data available

#### Flammability (solid, gas)

: No data available

#### Vapor Pressure

: No data available

#### Relative Vapor Density at 20 °C

: No data available

#### Relative Density

: No data available

#### Solubility

: Freely soluble in DMSO, soluble in methanol, sparingly soluble in ethanol, slightly soluble in acetonitrile, and practically insoluble in water.

#### Partition Coefficient: N-Octanol/Water

: No data available

#### Viscosity

: No data available

#### Molecular Weight Of Active Ingredient

: 396.51 g/mol

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### 9.2. Other Information No additional information available.

## SECTION 10: STABILITY AND REACTIVITY

- 10.1. **Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. **Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).
- 10.3. **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. **Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.
- 10.5. **Incompatible Materials:** Strong oxidizers.
- 10.6. **Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>). Nitrogen oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity:** Not classified

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	In dogs, mirabegron was lethal at a dose of 30 mg/kg, p.o. Acute findings in dogs included increased heart rate and emesis. In rats (800 mg/kg, p.o.), monkeys (60 mg/kg p.o.), and rabbits (30 mg/kg), mirabegron was not lethal. In monkeys and rabbits, acute findings included increased heart rate.

<b>Mirabegron (223673-61-8)</b>	
<b>ATE (Oral)</b>	500.00 mg/kg body weight
<b>Polyethylene glycol (25322-68-3)</b>	
<b>LD50 Oral Rat</b>	47000 mg/kg
<b>LD50 Dermal Rabbit</b>	> 20 ml/kg
<b>Hydroxypropyl ether of cellulose (9004-64-2)</b>	
<b>LD50 Oral Rat</b>	10200 mg/kg
<b>2,6-Di-tert-butyl-p-cresol (128-37-0)</b>	
<b>LD50 Oral Rat</b>	> 2930 mg/kg (Species: Sprague-Dawley)
<b>LD50 Dermal Rat</b>	> 2000 mg/kg
<b>Magnesium stearate (557-04-0)</b>	
<b>LD50 Oral Rat</b>	> 2000 mg/kg
<b>Iron oxide (Fe2O3) (1309-37-1)</b>	
<b>LD50 Oral Rat</b>	> 10000 mg/kg
<b>Cellulose hydroxypropyl methyl ether (9004-65-3)</b>	
<b>LD50 Oral Rat</b>	>= 4000 mg/kg

**Skin Corrosion/Irritation:** Not classified

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	Topical administration of mirabegron to rabbits did not result in skin irritation.

**Serious Eye Damage/Irritation:** Not classified

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	Mirabegron was non-irritating to skin and only minimally irritating to the eye of rabbits, which was ameliorated by immediate eye irrigation.

**Respiratory or Skin Sensitization:** May cause an allergic skin reaction.

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	Mirabegron showed a moderate skin sensitizing potential in guinea pigs.

**Germ Cell Mutagenicity:** Not classified

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	Negative in bacterial reverse mutation assay; negative in chromosomal aberration assay; negative in micronucleus assay.

**Carcinogenicity:** Not classified

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	Negative in rat and mouse carcinogenicity test.

<b>2,6-Di-tert-butyl-p-cresol (128-37-0)</b>	
<b>IARC group</b>	3

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<b>Iron oxide (Fe<sub>2</sub>O<sub>3</sub>) (1309-37-1)</b>	
<b>IARC group</b>	3

**Reproductive Toxicity:** Suspected of damaging the unborn child.

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	No effects on fertility or early embryonic development were noted in rats at nonlethal doses (up to 100 mg/kg/day). In rat embryo-fetal development studies, reversible delayed ossification was observed at a dose of 100 mg/kg/day. In rabbits, reduced fetal body weight was observed at a dose of 10 mg/kg/day. At maternally lethal doses in rabbits (30 mg/kg/day), cardiomegaly and dilated aorta were noted.

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** May cause damage to organs through prolonged or repeated exposure.

<b>Mirabegron (223673-61-8)</b>	
<b>Additional information</b>	In rats, decreases in circulating platelets and increases in the liver enzyme, alanine transferase were noted. In dogs, repeated doses were associated with increases in respiratory rate, increased heart rate, decreased blood pressure, peripheral vasodilation, and emesis. In monkeys, increases in heart rate and emesis were noted.

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** If tablet is crushed: May cause respiratory irritation.

**Symptoms/Injuries After Skin Contact:** May cause an allergic skin reaction.

**Symptoms/Injuries After Eye Contact:** If tablet is crushed: May cause eye irritation.

**Symptoms/Injuries After Ingestion:** May be harmful if swallowed.

**Chronic Symptoms:** Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

**Ecology - General** : This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

**Ecology - Water** : Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

<b>2,6-Di-tert-butyl-p-cresol (128-37-0)</b>	
<b>EC50 Daphnia 1</b>	0.84 mg/l
<b>EC50 Other Aquatic Organisms 2</b>	0.43 mg/l (Exposure time: 72 h - Species: <i>Desmodesmus subspicatus</i> )

**12.2. Persistence and Degradability** No additional information available.

### 12.3. Bioaccumulative Potential

<b>2,6-Di-tert-butyl-p-cresol (128-37-0)</b>	
<b>BCF fish 1</b>	230 - 2500
<b>Log Pow</b>	4.17

**12.4. Mobility in Soil** No additional information available.

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of contents and container according to local, regional, national, and international regulations.

**Ecology – Waste Materials:** Avoid release to the environment.

## SECTION 14: TRANSPORT INFORMATION

**14.1. In Accordance with DOT** Not regulated for transport.

**14.2. In Accordance with IMDG** Not regulated for transport.

**14.3. In Accordance with IATA** Not regulated for transport.

## SECTION 15: REGULATORY INFORMATION

**15.1 US Federal Regulations** Not applicable

**15.2 US State Regulations** Not applicable

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## SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date	: 06/10/2015
Other Information	: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

Astellas US GHS SDS