

# HERBICIDE

## FLAZASULFURON

### Wide spectrum herbicide

Flazasulfuron is a sulfonylurea herbicide which was discovered and developed by ISK in the late 1980's.

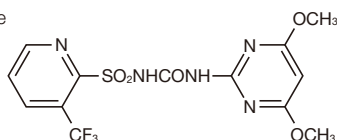
It controls a wide range of weeds covering both annual and perennial species. It is a selective systematic herbicide for pre-emergence and early post-emergence weed control.

Flazasulfuron has been registered in various countries for use in crops such as almonds and other tree nuts, citrus, conifers, grapes, sugarcane, warm season turfgrass, and in non-crop areas.



#### Physico-Chemical Properties

Chemical structure



Class : sulfonylurea

IUPAC name : 1-(4,6-dimethoxypyrimidin-2-yl)-3-(3-trifluoromethyl-2-pyridylsulfonyl)urea

Molecular weight : 407.3

Molecular formula : C<sub>13</sub>H<sub>12</sub>F<sub>3</sub>N<sub>5</sub>O<sub>5</sub>S

Vapour pressure : < 0.013 mPa (25°C)

Water solubility : 2.1 g/L (25°C, pH7)

Form : white powder

Development code : SL-160

#### Toxicology & Ecotoxicology

Rat LD<sub>50</sub> (oral) : > 5,000 mg/kg (m/f)

Rat LD<sub>50</sub> (dermal) : > 2,000 mg/kg (m/f)

Rat LC<sub>50</sub> (inhalation) : > 5.99 mg/L (m/f)

Skin irritation : non irritant (rabbit)

Eye irritation : slight irritant (rabbit)

Skin sensitization : not a sensitizer (guinea pig)

Avian LD<sub>50</sub> (acute oral) : > 2,000 mg/kg (quail, m/f)

Avian LD<sub>50</sub> (acute oral) : > 2,250 mg/kg (mallard duck, m/f)

Fish LC<sub>50</sub> : > 20 mg/L (trout, 96 h)

Bees LD<sub>50</sub> (acute contact) : > 100 µg/bee

*Daphnia magna* EC<sub>50</sub> : > 20 mg/L (48 h)

#### Application

**Uses** Flazasulfuron can be applied PRE and POST to control broadleaf and grass weed control, including sedge control.

Flazasulfuron can be applied in crops such as almonds and other tree nuts, citrus, conifers, grapes, sugarcane, warm season turfgrass, and in non-crop areas.

#### Mode of Action

**Plant Uptake** Flazasulfuron is rapidly absorbed by leaf and root tissue and is translocated, via the phloem and xylem, to meristem tissue. Flazasulfuron controls weeds by inhibiting acetolactate synthase (ALS), also called acetohydroxy acid synthase (AHAS). ALS is a necessary enzyme for the production of three branched-chain amino acids, isoleucine, leucine, and valine.

**Symptoms** Weeds treated with flazasulfuron will first begin to develop chlorosis in the new growth and then gradually, as the weed continues to be starved of the vital branched-chain amino acids, the chlorosis symptomology will develop in older growth. Chlorotic symptomology then turns to necrosis and desiccation of the plant tissue occurs. Control typically takes 3-4 weeks, from treatment to plant death.

**Selectivity** Crop selectivity of flazasulfuron exists based on the metabolic ability of some plants to breakdown flazasulfuron into inactive metabolites.

#### Product

<b>Trade Names</b>	CHIKARA, KATANA, MISSION, PARANDOL, FLAMARK, 芝草原, 秀百宮, シバゲンDF, etc.	
<b>Formulations</b>	25%WG, 10%WP	
<b>Registered Countries</b>	Asia	Taiwan, South Korea, Japan, Thailand, China
	Europe	Belgium, Bulgaria, France, Germany, Hungary, Italy, Romania, Serbia, Switzerland, etc.
	Americas	USA, Brazil, Colombia, etc.



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### Visual Effect of Herbicidal Activity (Weed: *Erigeron philadelphicus*)



At application      7 days after application      20 days after application

### Characteristics

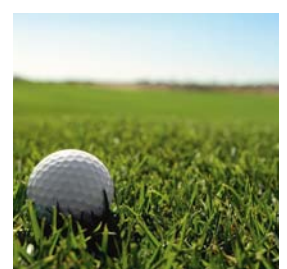
ALS inhibitor

Excellent activity at low dosages (25–100 g a.i./ha)

Broad weed spectrum including grasses, broadleaf weeds and sedges

Safe to permanent crops such as grapevine and citrus, sugarcane and warm season turfgrass

Safe to birds, fish, bees and other beneficial insects



### Weed Spectrum

	Weed Spectrum		Pre-emergence Application			Post-emergence Application		
	Scientific Name	Common Name	Rate (g a.i./ha)			Rate (g a.i./ha)		
			25	50	100	25	50	100
Grass weeds	<i>Alopecurus geniculatus</i>	Water foxtail	++	+++	+++	+++	+++	+++
	<i>Briza minor</i>	Little quakinggrass	+++	+++	+++	++	+++	+++
	<i>Digitaria sanguinalis</i>	Large crabgrass	++	+++	+++	++	+++	+++
	<i>Echinochloa crus-galli</i>	Bamyard grass	++	+++	+++	++	+++	+++
	<i>Eleusine indica</i>	Goosegrass	++	+++	+++	++	+++	+++
	<i>Lolium multiflorum</i>	Italian ryegrass	++	+++	+++	+++	+++	+++
	<i>Poa annua</i>	Annual bluegrass	+++	+++	+++	+++	+++	+++
	<i>Setaria viridis</i>	Green foxtail	+	+++	+++	++	+++	+++
Broadleaved weeds	<i>Amaranthus viridis</i>	Slender amaranth	+++	+++	+++	+++	+++	+++
	<i>Capsella bursa-pastoris</i>	Shepherd's-purse	++	+++	+++	+++	+++	+++
	<i>Cerastium glomeratum</i>	Sticky chickweed	+++	+++	+++	+++	+++	+++
	<i>Chenopodium album</i>	Common lamb's quarters	+++	+++	+++	+++	+++	+++
	<i>Conyza canadensis</i>	Horseweed	++	+++	+++	++	+++	+++
	<i>Conyza sumatrensis</i>	Fleabane	++	+++	+++	++	+++	+++
	<i>Hydrocotyle sibthorpioides</i>	Lawn pennywort	++	++	++	++	+++	+++
	<i>Plantago asiatica</i>	Chinese plantain	+	+	++	++	++	+++
	<i>Polygonum lapathifolium</i>	Pale smartweed	+++	+++	+++	++	++	+++
	<i>Rorippa palustris</i>	Marsh yellowcress	+++	+++	+++	+++	+++	+++
Sedges	<i>Cyperus microiria</i>	Asian flatsedge	+++	+++	+++	+++	+++	+++
	<i>Cyperus brevifolius</i>	Mullumbimby couch	++	+++	+++	+++	+++	+++
	<i>Cyperus rotundus</i>	Purple nutsedge	+	++	+++	++	+++	+++

+++ : Excellent control, ++ : Good to Fair control, + : Poor control

Application: Pre-emergence or post-emergence (3–4 leaf-stage or less than 10 cm) of weeds

Adjuvant: non-ionic surfactant