

# INSECTICIDE

## FLONICAMID

### Systemic insecticide

Flonicamid is a systemic insecticide discovered by ISK. ISK has developed flonicamid on a global basis since the late 1990's, and it is registered in over forty countries including the Americas, Asia, Europe and Africa mainly as a foliar application.

Flonicamid exhibits excellent performance for control of almost all important aphid species in apples, peaches, wheat, potato vegetables, cotton and ornamentals, etc.

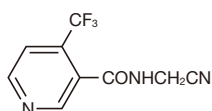
Flonicamid has no negative impact on pollinating insects or natural enemies, and thus, flonicamid will provide a new option for integrated pest management programs.

Flonicamid also has a good toxicological, environmental and ecotoxicological profile.



#### Physico-Chemical Properties

Chemical structure



Class : pyridincarboxamide

IUPAC name : *N*-cyanomethyl-4-(trifluoromethyl)nicotinamide

Molecular weight : 229.2

Molecular formula : C<sub>9</sub>H<sub>8</sub>F<sub>3</sub>N<sub>3</sub>O

Vapour pressure : 2.55x10<sup>-6</sup> Pa (25°C)

Water solubility : 5.2 g/L (20°C)

Form : Off-white to light beige, solid

Development code : IKI-220

#### Toxicology & Ecotoxicology

Rat LD<sub>50</sub> (oral) : 884 mg/kg (m), 1768 mg/kg (f)

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

Rat LC<sub>50</sub> (inhalation) : > 4.9 mg/L (m/f)

Skin irritation : non irritant (rabbit)

Eye irritation : non 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) : > 2,621 mg/kg (mallard duck, m),  
1,591 mg/kg (mallard duck, f)

Fish LC<sub>50</sub> : > 100 mg/L (trout, 96 h)

Fish LC<sub>50</sub> : > 100 mg/L (bluegill, 96 h)

Bees LD<sub>50</sub> (acute oral) : > 60.5 µg/bee (48 h)

Bees LD<sub>50</sub> (acute contact) : > 100 µg/bee (48 h)

*Daphnia magna* EC<sub>50</sub> : > 100 mg/L (48 h)

#### Application

With foliar spray application at the rates of 50-100 g a.i./ha, flonicamid exhibits excellent aphicidal activity and also shows good insecticidal activity against other sucking insect pests such as thrips, whiteflies, planthoppers, leafhoppers, plant bugs, and mealybugs in fruit trees, cereals, rice, potatoes, cotton, vegetables and ornamentals. Flonicamid soil applications also provide control of the foliar pests mentioned above.

#### Mode of Action

Flonicamid rapidly inhibits the feeding behavior of aphids, and has better action through ingestion than by contact.

Its mode of action is different from other insecticides such as neonicotinoids, pymetrozine and pyrifluquinazon.

Flonicamid belongs to IRAC Group 29 and is the only insecticide in this class.

#### Product

<b>Trade Names</b>	ULALA, TEPPEKI, CARBINE, BELEAF, ARIA, TURBINE, 隆施, 四季紅, etc.	
<b>Formulations</b>	10%DF, 50%DF, 50%SG, 1%G	
<b>Registered Countries</b>	Asia	China, India, Japan, South Korea, Taiwan, etc.
	Europe	Belgium, Czech Republic, France, Germany, Hungary Romania, Italy, Netherlands, Poland, Spain, Switzerland, UK, etc.
	Americas	Canada, Brazil, Mexico, USA, etc.
<b>Crops</b>	Fruit trees, Cereals, Potatoes, Cotton, Vegetables, Ornamentals, etc.	



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## Toxic Symptom in Adult of *Myzus persicae*



Flonicamid (50 ppm),  
3 days after application



Untreated

## Characteristics

Novel mode of action

No cross-resistance with other conventional insecticide has been reported.

Offers good residual control: 2-3 weeks

No adverse-effects on beneficials

Low application dose rate : 50-100 g a.i./ha

Fits in Integrated Pest Management System

Excellent activity to major aphid species

Effective against whiteflies, thrips, plant bugs, leafhoppers and planthoppers

Excellent translaminar and systemic activity through xylem vessels and control the aphid on untreated young leaves and in rolled leaves

## Pest Spectrum

Hemiptera	Aphid	<i>Acyrtosiphon pisum</i>	<i>Acyrtosiphon kondoi</i>	<i>Anuraphis helichrysi</i>
		<i>Aphis craccivora</i>	<i>Aphis fabae</i>	<i>Aphis glycines</i>
		<i>Aphis gossypii</i>	<i>Aphis nasturtii</i>	<i>Aphis pomi</i>
		<i>Aphis spiraeicola</i>	<i>Aulacorthum solani</i>	<i>Brevicoryne brassicae</i>
		<i>Brachycaudus helichrysi</i>	<i>Brachycaudus schwartzi</i>	<i>Diuraphis noxia</i>
		<i>Dysaphis plantaginea</i>	<i>Dysaphis pyri</i>	<i>Eriosoma lanigerum</i>
		<i>Hyalopterus pruni</i>	<i>Lipaphis erysimi</i>	<i>Macrosiphoniella sanborni</i>
		<i>Macrosiphum euphorbiae</i>	<i>Macrosiphum rosae</i>	<i>Myzus cerasi</i>
		<i>Myzus mumeicola</i>	<i>Myzus nicotianae</i>	<i>Myzus persicae</i>
		<i>Nasonovia ribisnigri</i>	<i>Ovatus malicolens</i>	<i>Phorodon humuli</i>
		<i>Rhodobium porosum</i>	<i>Rhopalosiphum maidis</i>	<i>Rhopalosiphum nymphaeae</i>
		<i>Rhopalosiphum padi</i>	<i>Rhopalosiphum rufiabdominalis</i>	<i>Schizaphis graminum</i>
		<i>Schizaphis piricola</i>	<i>Sitobion avenae</i>	<i>Sitobion ibarae</i>
		<i>Therioaphis maculata</i>	<i>Toxoptera citricidus</i>	
		Whitefly	<i>Bemisia tabaci</i>	<i>Trialeurodes vaporariorum</i>
Planthopper	<i>Laodelphax striatella</i>	<i>Nilaparvata lugens</i>	<i>Sogatella furcifera</i>	
Leafhopper	<i>Arboridia apicalis</i>	<i>Amrasca biguttula</i>	<i>Empoasca onukii</i>	
Psyllid	<i>Bactericera cockerelli</i>			
Plant bug	<i>Lygus hesperus</i>	<i>Lygus lineolaris</i>	<i>Lygocoris lucorum</i>	
Thysanoptera	Thrips	<i>Frankliniella occidentalis</i>	<i>Scirtothrips dorsalis</i>	<i>Thrips tabaci</i>



*Myzus persicae*



*Amrasca biguttula*



*Frankliniella occidentalis*

