ANNEX B

ENDOSULFAN

B - 3 : FURTHER INFORMATION AND EFFICACY

B.3 Data on application and further information

B.3.1 Data on application relevant to the active substance (IIA 3.1 to 3.6)

Endosulfan is successfully used for controlling numerous insect pests and some mites in a wide variety of different crops. In addition to numerous insects Thiodan also controls gall mites *(Eriophyidae)* and soft or broad mites *(Tarsonemidae*) damaging crops.

Endosulfan acts via the GABA receptor system (opening the chloride transport, increasing glutamate level). It penetrates into the insect via the tracheas, by ingestion, and has some contact activity. When applied to plants, endosulfan can penetrate into plant tissue without developing systemic action. The product is hydrolysed by aqueous alkalis and acids to produce endosulfan diol. The lethal effect on the insect may be seen only after several hours (12-24), there is no “knock down effect”, first symptom is mainly tremor.

Endosulfan is for use in arable crops and greenhouse use in agriculture, horticulture, orchards, forestry and nurseries. The harmful organism controlled by crops are summarised in table 3.1-1.

Table 3.1-1: Harmful organism controlled by crop

Crop Type	Pests Controlled	
Citrus	Aphids	*Aphis craccivora*
		Aphis spiraecola
		Toxoptera aurantii
	White flies	*Aleurothrixus floccosus*
	Thrips	*Scirtothrips aurantii*
	Lepidoptera	*Prays citri*
Peach	Aphids	*Myzus persicae*
	Peach twig and tree borer	*Anarsia lineatella*
		Sanninoidae exitiosa
		Synanthedon pictipes
Nuts	Aphids	*Chromaphis juglandicola*
	Coleoptera	*Curculio nucum*
	Lepidoptera	*Homoeosoma vagella*
	Bugs	*Amblypelta spp.*

Crop Type	Pests Controlled	
Apple, Pear	Aphids	*Eriosoma lanigerum*
		Myzus persicae
		Aphis pomi
	Psyllids	*Psylla mali*
		Psylla pyri
		Psylla pyricola
	Coleoptera	*Anthonomus pomorum*
		Phyllobius oblongus
		Xyleborus spp.
	Lepidoptera	*Cheimatobia brumata*
		Erannis defoliaria
		Euproctis similis
		Hyponomeuta malinella
		Lymantria spp.
		Malacosoma neustria
	Gall midge	*Dasyneura piri*
	Mites	*Eriophyes piri*
Currants	Bud mites	*Cecidophyopsis ribis*
Table and Wine Grapes	Aphids	*Phylloxera vitifoliae*
	Lepidoptera	*Clysia ambiguella*
		Paralobesia viteana
		Lobesia botrana
		Sparganothis pilleriana
	Gall mites	*Eriophyes vitis*
Vegetables incl. Potatoes	Aphids	*Myzus persicae*
		Aphis fabae
		Semiaphis dauci
	Coleoptera	*Diabrotica spp.*
		Epilachna spp.
		Epitrix spp.
		Leptinotarsa decemlineata
		Crioceris asparagi
	Bugs	*Nezara viridula*
		Lygus spp.

Crop Type	Pests Controlled	
	Lepidoptera	*Earias spp.*
		Heliothis spp.
		Mamestra brassicae
		Pieris rapae
		Plusia spp.
		Plutella xylostella
		Plutella maculipennis
Vegetables incl.	Lepidoptera	*Spodoptera spp.*
Potatoes	Thrips	*Thrips tabaci*
	Seed midge	*Dasyneura brassicae*
	Mites	*Polyphagotarsonemus latus*
		Aculus lycopersici
	White flies	*Bemisia tabaci*
		Trialeurodes vaporariorum
	Psyllids	*Trioza spp.*
Cotton	Aphids	*Aphis gossypii*
	Lepidoptera	*Heliothis armigera*
		Spodoptera littoralis
		Agrotis spp.
		Trichoplusia ni
		Pectinophora gossypiella
	Coleoptera	*Anthonomus grandis*
	Mites	*Polyphagotarsonemus latus*
	Thrips	*Thrips tabaci*
	White fly	*Bemisia tabaci*
	Bugs	*Lygus spp.*
		Nezara viridula
Oilseed rape	Coleoptera	*Ceuthorhynchus quadridens*
		Ceuthorhynchus assimilis
		Ceuthorhynchus napi
		Meligethes aeneus
		Psylliodes chrysocephala
	Gall midge	*Dasyneura brassicae*
	Aphids	*Aphis fabae*
		Myzus persicae
		Brevicoryne brassicae

The main metabolite endosulfan-sulphate has partly similar and partly less good efficacy compared to endosulfan (see Doc No.: A41240)

Resistance was reported for aphids in cotton, diamond backmoth in cabbage and cotton bollworm in parts of Australia.

Synergistic effect is reported in combination with Bacillus thur. products, synthetic pyrethroids and Beauveria formulations.

B.3.2a Data on application relevant to the plant protection product (IIIA 3)

Applicant: Task Force: Hoechst Schering AgrEvo GmbH Makhteshim Agan International Co-ordination Centre.

Tradenames: Thiodan, Cyclodan, Thionex, Endofan, Thyonex, FAN 35

B.3.2.1a Field of use envisaged, e.g. field, protected crops, storage of plant products and home gardening

Arable crops and greenhouse use in agriculture and horticulture, orchards, forestry, and nurseries.

B.3.2.2a Effects on harmful organisms, e.g. contact, inhalation or stomach poison, fungitoxic or fungistatic etc., systemic or not in plants

Endosulfan acts via the GABA receptor system (opening the chloride transport, increasing glutamate level). It penetrates into the insect via the tracheas, by ingestion, and has some contact activity.

When applied to plants, endosulfan can penetrate into plant tissue without developing systemic action. The product is hydrolysed by aqueous alkalis and acids to produce endosulfan diol.

The lethal effect on the insect may be seen only after several hours (12-24), there is no „knock down effect“, first symptom is mainly tremor.

B.3.2.3a Details of intended use, e.g. types of harmful organisms controlled and/or plants or plant products to be protected

The product is successfully used for controlling numerous insect pests and some mites in a wide variety of different crops In addition to numerous insects Thiodan also controls gall mites *(Eriophyidae)* and soft or broad mites *(Tarsonemidae*) damaging crops. See table 3.1-1.

B.3.2.4a Application rate

The application rate is summarised in table 3.2.4a-1

Table 3.2.4a-1: Application rate for Thiodan

Crop	Dose Rate a.s. g/ha per Application Southern Europe
Citrus	1050
Tree nuts	800
Pome fruit	1050
Stone Fruit	800
Grapes (table and wine)	1050
Currants	-
Solanacea (Tomatoes)	530 (F) – 800 (G)
Cucurbits (inedible peel)	320-530
Cotton	840
Potatoes	530
Sugar beet	500

B.3.2.5a Concentration of active substance in material used (e.g. in the diluted spray, baits or treated seed)

Crop	kg a.s/hl per Application Southern Europe
Citrus	0.035
Tree nuts	0.08
Pome fruit	0.053-0.105
Stone Fruit	0.053
Grapes (table and wine)	0.053-0.105
Currants	-
Solanacea (Tomatoes)	(F) 0.053-0.105 (G) 0.053
Cucurbits (inedible peel)	0.053
Cotton	0.105
Potatoes	0.088
Sugar beet	0.125

B.3.2.6a Method of application

Conventional foliar spray using handheld equipment or motor driven boom sprayers and airborne sprayers.

B.3.2.7a Number and timing of applications and duration of protection

Endosulfan is preferably recommended as an „ early season “ product. Caterpillars (external feeders) should preferably be controlled during their 1st or 2nd instars. For control of stem and fruit borers as well as bollworms, crops should be treated prior to egg hatching. Otherwise locally recommended economic threshold practices may be followed.

The normally necessary number of applications is limited to 1 or 2 per year.

B.3.2.8a Necessary waiting periods or other precautions to avoid phytotoxic effects on succeeding crops

No waiting period for succeeding crops is necessary.

Crop selectivity: Reports about phytotoxic effects are extremely scarce and mostly due to uncontrolled tank mixing with products which were not recommended for this purpose.

B.3.2b Data on application relevant to the plant protection product (IIIA 3)

Applicant: Calliope, S.A.
Tradenames: Callistar

B.3.2.1b Field of use envisaged, e.g. field, protected crops, storage of plant products and home gardening

Agriculture, horticulture, forestry and viticulture.

Field and greenhouse use.

B.3.2.2b Effects on harmful organisms, e.g. contact, inhalation or stomach poison, fungitoxic or fungistatic etc., systemic or not in plants

Effect: Contact and stomach action
Translocation in plants: Non systemic

B.3.2.3b Details of intended use, e.g. types of harmful organisms controlled and/or plants or plant products to be protected

Generally, Endosulfan controls chewing, sucking and boring insects and mites on a very wide range of crops, including fruit (including citrus), vine, olives, vegetables, ornamentals, potatoes, cucurbits, cotton, tea, coffee, rice, cereals, maize, sorghum, oilseed crops, hops, hazels, sugar cane, tobacco, alfalfa, mushrooms, forestry, glasshouse crops, etc. It also controls tsetse flies.

B.3.2.4bApplication rate

Depending on the type of crop and the area in which it is grown, application rates usually range between 0.45 kg a.i. and 1.4 kg/ha, but both smaller and doses have occasionally been used.

B.3.2.5b Method of application

Classic spraying with pneumatic systems or projected spray systems. Incorporate first the formulated product while the stirring system is on, then proceed to addition of water:

<> 400-1000 l/ha when spraying with projected spray.
<> 80-150 l/ha when spraying with pneumatic system.

Application must be carried out just after preparing the mixture. It is absolutely necessary to keep on mixing until the application is performed. In case of stopping, there may be formation of a deposit which will be the difficult to mix again and homogenise.

B.3.2.6b Number and timing of applications and duration of protection

Number and timing of application: One application for curative treatment.

Persistence of action on foliage: 3-7 days.

B.3.2.7b Necessary waiting periods or other precautions to avoid phytotoxic effects on succeeding crops

If a repeat application is needed, this would depend on advises from local agricultural advising services.

B.3.2c Data on application relevant to the plant protection product (IIIA 3)

Applicant: Luxan B.V. (Excel Industries Ltd)

Tradenames: Endosulfan 35 EC, Endocel 35 EC and Endo 35 EC

B.3.2.1c Field of use envisaged, e.g. field, protected crops, storage of plant products and home gardening

Agriculture and horticulture.

Insecticide used on a very wide range of crops, including fruit, vines. olives, vegetables, ornamentals, potatoes, cucurbits, cotton, tea, coffee, rice, cereals, maize, sorghum, oilseed crops, hops hazels, sugar cane, tobacco, alfalfa, mushrooms, forestry, glasshouse crops, etc. Also controls tsetse flies.

B.3.2.2c Effects on harmful organisms, e.g. contact, inhalation or stomach poison, fungitoxic or fungistatic etc., systemic or not in plants

Non systemic insecticide and acaricide with contact and stomach action.

B.3.2.3c Details of intended use, e.g. types of harmful organisms controlled and/or plants or plant products to be protected

Crop	Pest controlled.
Cotton	Jassids, Aphids, White flies, Thrips, Leaf roller, Semilooper, Grey weevil, Dusky cotton bug, Spotted bollworm, American bollworm, Pink bollworm, Mites
Sunnhemp	Gujarat Hairy, Canterpillar
Jute	Semilooper, Bihar Hairy Caterpillar, Yellow mites
Cereals	Stem borer
Paddy	Leaf hopper, Rice hispa, Gundhi bug, Swarming Caterpillar, Case worm, Gall Midge, Army worm, Leaf roller
Shorgum	Earhead Midge, Earhead bug, Army worm, Shorgum tissue borer
Wheat	Cutworms
Barley	Aphids
Maize	Maize stalk borer, Maize stem borer
Red Gram	Graam podborer, Gram Pod fly, Jassids, Aphids Greey weevil, Hairy Caterpillar, Beetle
Benegal gram	Pod borer, Bihar Hairy, Caterpillar
Soya bean	White stem borer, Stem fly
Okra	Aphids, Leaf hoppers Mites, Shoot and Fruit borer
Potato	Potato Tuber Moth, Leaf eating caterpillars, Potato Cutworms

Crop	Pest controlled.
Cutworm	Diamond Backmoth, Cabbage leaf webber
Cauliflowers	The painted bug
Radish	Mustard aphid, Mustard sawfly
Bitter gourd	Grubs
Sweet potatoe	Tortoise beetle
Sunflower	Heliothis, Head borer
Mustard	Mustard aphids, gall midge, Saw fly
Groundnut	Aphids, Thrips, Groundnut leaf webber
Castor	Castor semilooper
Appel, Lichti, plum, pear and other fruits	Aphids, Caterpillars, Psyllids, Weevils aphids, Defolating beetles, Peach leaf curly aphids, Tent caterpillars, Plum case worm
Citrus	Citrus leaf folder, Citrus psylla, Lemon butterfly
Grape vine	Chafer beetles
Coffee	Shoot mealy bug, Green bug, Brown bug
Tea	Caterpillars, Jassids, Mites,Tea mosquito, Thrips
Cashew	Blossomwebber.

B.3.2.4c Application rate

Crop	Rate (g/ ai ha)
Cotton	35 - 70
Sunnhemp	35.7
Jute	35.7
Paddy	35.7
Shorgum	53.6
Maize	35.7
Barley	35.7
Wheat	35.7
Benegal gram	53.6
Vegetables	35.7
Potato	35.7
Onion	35.7

B.3.2.5c Concentration of active substance in material used (e.g. in the diluted spray, baits or treated seed)

Maximum 70 g ai/350 l water when used in arable crops, 35 g ai/350 l water/ha.

B.3.2.6c Method of application

Hydraulic Tractor mounted field crop sprayer and portable sprayer.

B.3.2.7c Number and timing of applications and duration of protection

2 - 4 in Cotton 25 - 40 days after sowing or when pest appears

2 in Sunnhemp 15 days after sowing

4 - 5 in Jute 20 - 25 days after sowing

3 - 4 in Paddy 30 days after transplanting

3 - 4 in Shorgum 50 - 60 % earhead emergence, 4 - 5 days after the first appn.

2 - 3 in Maize 30 - 35 days after sowing

1 - 2 in Barley when pest appears

1 - 2 in Wheat when pest appears

2 in Benegal gram 120 -125 days after sowing

2 - 3 in Vegetables10 - 60 days after sowing or when pest appears

2 in Potato 60 days after sowing or when pest appears

3 Onion 45 days after sowing

B.3.2.8c Necessary waiting periods or other precautions to avoid phytotoxic effects on succeeding crops

None.

B.3.3 Summary of data on application

The plant protection products containing Endosulfan and that were submitted as example for the evaluation of the active substance for its inclusion in the Annex I are insecticides for use in agriculture and horticulture, orchards, forestry and nurseries, arable crops and greenhouse crops.

When applied endosulfan penetrates into the insect via the tracheas, by ingestion and has some contact activity. Endosulfan can penetrate into plants tissue without developing systemic action.

They are used for controlling numerous insects pests and some mites in a wide variety of different crops. The dose rate in southern Europe zones varies from 320 g a.i/ha to 1050 g ai/ha and in northern Europe zones varies from 210 g ai/ha to 1050 g ai/ha.

The number of applications is limited in 1 or 2 per year, no waiting period for succeeding crops is necessary since no phytotoxic effects have been reported.

B.3.4 Further information on the active substance (IIA 3.7 to 3.9)

B.3.4.1 Recommended methods and precautions concerning handling, storage, transport or fire

Handling:

Use good personal hygiene.
Provide exhaust ventilation.
Do not empty containers over cooking vessels containing combustible gas mixtures.

Storage:

Storage rooms must be properly ventilated.
Keep only in original containers.
Do not store together with animal feedstock and with foodstuffs.
Keep container tightly closed and dry in a cool, well-ventilated place.
The storage temperature should lie between 0 ^{o}C and 30 ^{o}C, maximum up to 50 ^{o}C

Personal protective equipment:

Do not inhale dust.
Observe the usual precautions when handling chemicals.
Do not eat, drink or smoke during work time.
Remove soiled or soaked clothing immediately.
Clean hands and face during work intervals and after work.
Store work clothing separately.

Respiratory protection:

Short term: filter apparatus, P3 filter

Hand protection: rubber or PVC gloves

Eye protection: face shield, protective goggles

Body protection: protective clothing

Transport:		
	RID/ADR:	6.1 / 72 B
	ADNR:	6.1 / 72 B
	IMDG / UN	6.1 / 2671 / II
	EmS	6.1 - 04 MFAG 500
	ICAO/IATA-DGR:	6.1 /2761 / II

Fire-.fighting measures:

Suitable extinguishing media: water mist, foam carbon dioxide, dry powder

In the event of fire the following can be released: sulphur oxides,

Hydrogen chloride (Hcl)

Protection against fire and explosion:

For fire-fighting, use self-contained breathing apparatus, wear full protective suit, Collect contaminated firefighting water separately, must not be discharged into drains

B.3.4.2 Procedures for destruction or decontamination

B.3.4.2.1 Controlled incineration

The preferred method for disposal of endosulfan is controlled incineration by an approved industrial incineration plant. Small volumes may also be disposed of by communal waste incineration.

The chlorine content of endosulfan is less of 60%. Therefore its pyrolytic behaviour under controlled conditions at 800 ^{o}C is not critical with regard of polyhalogenated dibenzo-p-dioxins.

Reference: Kübel, A55971

B.3.4.2.2 Others

Packaging and contaminated materials that cannot be cleaned should be disposed off as product waste.

B.3.4.3 Emergency measures in the case of an accident

Endosulfan is classified as "very toxic to water organisms" therefore a contamination of water has to be prevented. In case of an accident contaminated water has to be collected separately and should not be allowed to enter the drainage system. Collected water has to be treated as active substance (see B.3.4.2.1).

B.3.5a Further information on the plant protection product (IIIA 4)

Applicant: Task Force: Hoechst Schering AgrEvo GmbH Makhteshim Agan International Co-ordination Centre.

Tradenames: Thiodan, Cyclodan, Thionex, Endofan, Thyonex, FAN 35

B.3.5.1a Packaging and compatibility with packaging materials

¡Error! Marcador no definido.**B.3.5.1.1a Full description of materials used, manner of construction, size of opening, type of closure and seals**

Reference:	A54121
Author:	Simon-Hullmann, Rexer
Result:	Primary packaging: Polyamide (PA)/adhesive/high density polyethylene
Capacity:	0.25 - 10 l
Opening:	0.25-1l: 50 mm
	3 - 10l: 63 mm
Closure:	Injection mouled with induction sealing disc
Outer packing:	corrugated case

¡Error! Marcador no definido.**B.3.5.1.2a Suitability of the packaging, including closures, in terms of strength, leakproofness and resistance to normal transport and handling**

Reference:	A54121
Author:	Simon-Hullmann, Rexer
Result:	Packages have been tested and comply with Stacking test ADR 3555

¡Error! Marcador no definido.**B.3.5.1.3a Resistance of the packaging material to its contents**

Reference:	A54121
Author:	Simon-Hullmann, Rexer
Test substance:	Formulation
Result:	The stability of primary packaging material is considered to be acceptable

B.3.5.2a Procedures for cleaning application equipment

Reference: A56408

Author: Schoeni, Rexer

Test substance: Formulation

Result: All application equipment and contaminated protective clothing should be washed/cleaned with water or a dilute detergent solution, e.g. Shellsol and thoroughly rinsed three times. According to determination of pourability the max. residue is 0.3 % and the max. rinsed residue is 0.1 %

Care should be taken not to rinse contaminated washings from application equipment into waste water channels.

Contaminated cleaning liquids should be disposed of safely according to local regulations. Objects made of absorbent material and not properly cleanable should be disposed of.

B.3.5.3a Re-entry periods, necessary waiting periods or other precautions to protect man, livestock and the environment

Crop	**Pre harvest intervals - Southern Europe**	**Pre harvest intervals - Northern Europe**
Citrus	21 days	
Pome fruit	14 days	21 days
Tree nuts	21 days	21 days
Stone fruits	21 days	21 days
Table and wine grapes	28 days	70 days
Strawberries	appl.before flowering and/or after harvest	appl.before flowering and/or after harvest
Cane fruit		21 days
Currants		70 days
Tomatoes/peppers	3 days	7 days
Cucurbits (inedible peel)	7 days	
Beans (succulent)	14 - 21 days	14 days
Peas (succulent)	14 - 21 days	14 days
Dry peas	28 days	28 days
Cotton	15 days, last appl., when balls partly open	
Oilseed rape		56 days
Potatoes	14 days	14 days
Wheat		28 days

Crops should not be re-entered within one day after application.

The preharvest interval (PHI) period were fixed according to the residue data submitted and are the following:

Crop/Commodity	Pre-harvest interval (days)
Oranges	21
Lemons	21
Mandarins	21
Tree nuts	21
Pome fruits	21 N, 14 S
Stone fruits	21
Grapes	70 N, 28 S
Strawberries	37-66 *
Cane fruits	21
Currants	70
Tomatoes	7 N, 3 S
Peppers	7 N, 3 S
Cucurbits	7
Beans and peas with and with out pods	14-21
Dry peas	28
Oilseed rape	56
Sunflower	63
Soyabean	30
Cotton	15
Potatoes	14
Wheat	28
Maize	70
Tea	7
Coffee	30
Cacao	28

*According to phenological state

B.3.5.4a Recommended methods and precautions concerning handling, storage, transport or fire

Handling: Use good personal hygiene.
Provide exhaust ventilation
Store and handle only in the open air or in explosion-proof areas.
Take precautionary measures against electrostatic loading.

Storage: Storage rooms must be properly ventilated. Keep only in original containers.
Suitable materials: V2a, glass, aluminium, stove-painted steel.
Unsuitable materials: Polyethylene, rubber.
Do not store together with animal feedstocks and with foodstuffs.
Keep container tightly closed and dry in a cool, well-ventilated place. The storage temperature should lie between 0 ^{o}C and 30 ^{o}C, maximum uo to 50 ^{o}C

Procedures to minimise the generation of waste and left overs: To minimise waste of the product, users are required to rinse packages after emptying and to add the rinsate to the spraying liquid. To minimise waste of packages, it is recommended that empty and rinsed containers are delivered to a local container collection program, if existing. If this is not existing, empty and rinsed containers have to be delivered to the commercial waste collection.

Reference: Kübel, 1995, Doc No.: A55972

Personal protective equipment:

Do not inhale vapours.
Avoid contact with eyes and skin.
Observe the usual precautions when handling chemicals.
Do not eat, drink or smoke during work time.
Remove soiled or soaked clothing immediately.
Clean hands and face during work intervals and after work.
Store work clothing separately

Hand protection:	rubber or PVC gloves
Eye protection	face shield, safety glasses
Body protection:	protective clothing

Transport:

Road transport	RID/ADR:	6.1 / 72 B
Inland waterways	ADNR:	6.1 / 72 B
Marine transport	IMDG / UN	6.1/2995/ II
EmS	6.1 - 01 MFAG 500	
Air transport	ICAO/IATA-DGR:	6.1 /2995 / II
Dispatch per post	not permitted	

B.3.5.5a Emergency measures in the case of an accident

First aid measures:

Remove soiled or soaked clothing immediately.

Seek medical advice immediately.

After inhalation remove the casualty into fresh air and keep him calm. When vapours are intensively inhaled, seek medical help immediately

After contact with skin wash off immediately with soap and water

After contact with eyes rinse thoroughly with plenty of water and seek medical advice

After ingestion: summon a doctor immediately.

Induce vomiting in case of medical help is not readily available and when the patient is conscious (Vomit should not go into the respiratory tract).

Hints for the physician:

Symptoms: Headache, dizziness, disorientation, abdominal pains, unconsciousness

Treatment: Elementary help, decontamination, treat symptomatically.

If swallowed, in the event of vomiting, risk of product entering the lungs.

When swallowed, give 200 ml Parrafinoil to drink, then flush out stomach and then give activated charcoal and Sodium sulphate. Against cramps, give Diazepam intravenously and Calcium gluconate (10%).

Contra-indication: Epinephrine-derivates

Fire-.fighting measures:

Suitable extinguishing media: water mist, foam carbon dioxide, dry powder

In the event of fire the following can be released: sulphur oxides, Hydrogen chloride (Hcl)

For fire-fighting, use self-contained breathing apparatus, wear full protective suit

Collect contaminated firefighting water separately.

Must not be discharged into drains

Remove product from areas of fire, or otherwise cool containers with water in order to avoid pressure being build up dus to heat.

Accidental release measures:

Remove persons to safety. Use personal protective clothing.
Do not allow to enter drains or waterways.
Take up with absorbent material (eg. sand, kieselgur, universal binder)
Pick up for disposal in tightly closed containers.

B.3.5.6a Procedures for destruction or decontamination of the plant protection product and its packaging

B.3.5.6.1a Controlled incineration

The preferred method for disposal of endosulfan emulsifiable concentrate 352 g/l is controlled incineration by an approved industrial incineration plant. Small volumes may also be disposed of by communal waste incineration.

The chlorine content of endosulfan emulsifiable concentrate 352 g/l is 17,9 %, calculated by the chlorine content of endosulfan and its content in the preparation. All other components in the formulation do not contain chlorine.

Therefore its pyrolytic behaviour under controlled conditions at 800 oC is not critical with regard of polyhalogenated dibenzo-p-dioxins.

Reference: Kübel 1995, Doc No.: A55970
Reference: Dehmer, Albrecht, 1985a, Doc.Nr.: A30561

The empty containers have to be washed and conveyed to a housewaste disposal area. The washing solutions have to be added to the spray mixture, otherwise they have to be burned in a commercial incinerator (Dehmer, Albrecht, 1985b, Doc.Nr.: A30562

B.3.5.6.2a Others

Combustible types
Polyamide innerlined polyethylene containers
Wash the emptied containers thoroughly with plenty of water, burn them in a commercial incinerator or treat them like the noncombustible types. In field applications the washing solutions have to be added to the spray mixture, otherwise they have to be burned in a commercial incinerator.

Noncombustible types
Glass bottles, aluminium bottles, noncoated steel containers and stell containers with annealing inside lacquering.

Wash the emptied containers thoroughly with plenty of water and mutilate them by puncturing or other means to ensure no further use. Convey these containers to a housewaste disposal area. In field

applications the washing solutions have to be added to the spray mixture, otherwise they have to be burned in a commercial incinerator.

Reference: Rexer, 1995, Doc. No.: A56063

B.3.5b Further information on the plant protection product (IIIA 4)

Applicant: Calliope, S.A.
Tradenames: Callistar

B.3.5.1b Packaging and compatibility with packaging materials

¡Error! Marcador no definido.**B.3.5.1.1b Full description of materials used, manner of construction, size of opening, type of closure and seals**

5 litre Agrichem Plain KO5B-63 mm T/E Neck – 200 g

Capacity:	5 (nominal) and 5.90 (brimful) litres
Height:	305 mm
Width:	193 mm
Depth:	142 mm
Sleeve height:	156 ± 3.0 mm
Neck diameter:	63 mm
Cap:	63 mm T/E ASTRA M.1673
Wad:	PET/ALU/PEE
Quantity/Pallet:	168 (continent); 384 (UK)
Quantity/Lorry:	9408 (continent); 6720 (UK)

Packaging:

Description:	A cardboard box (corrugated carton 6.6 mm; 4C + E: -2824)
Dimensions:	L x w x h: 402 x 298 x 328 mm (external)
Closure:	Adhesive tape
Content:	4 bottles
Max. Gross weight:	29 kg

Details are with the applicant and can be provided on request.

¡Error! Marcador no definido.**B.3.5.1.2b Suitability of the packaging, including closures, in terms of strength, leakproofness and resistance to normal transport and handling**

Test have been performed by BVT (Bureau for the Technical Verifications)

Drop test with the bottle

Conditioned:	-18ºC
Drop height:	1.20 m
Maximal gross weight:	29 kg
Fall position:	on the bottom

	on the top
	on the large side of the bottle
	on the small side of the bottle
	diagonally on a corner
Results:	No loss, no break. Little flattening on the corner

Stacking test with filled cardboard boxes

Conditioned:	+ 23ºC and 50% relative humidity
Stack height:	3.0 m
Weight of the loading:	237 kg
Duration of the test:	24 hours
Results:	No disorderliness was observed

Cobb value (water absorption) 142 g/m^2/30 sec.

Details of the test are with the applicant and can be provided on request.

Conclusion

Packaging is in agreement with the ADR transport regulations.

Type of packing: 4G/Y 29/S/90 F-BUT 186302

¡Error! Marcador no definido.**B.3.5.1.3b Resistance of the packaging material to its contents**

Data not submitted

B.3.5.2b Procedures for cleaning application equipment

Containers and mixing systems should be washed and used for spraying immediately after use, to avoid residue deposition into the system.

B.3.5.3b Re-entry periods, necessary waiting periods or other precautions to protect man, livestock and the environment

Applications should be performed at least 15 days before harvest.

Re-entry or further waiting periods or other special precautions are not proposed.

B.3.5.4b Recommended methods and precautions concerning handling, storage, transport or fire

A Safety Data Sheet (Annex C)

B.3.5.5b Emergency measures in the case of an accident

See Safety Data Sheet (Annex C)

B.3.5.6b Procedures for destruction or decontamination of the plant protection product and its packaging

See Safety Data Sheet (Annex C)

B.3.5.6.1b Controlled incineration

Incineration must be done in a specialised treatment centre, agreed by authorities for incineration of toxic products.

B.3.5.6.2b Others

None

B.3.5c Further information on the plant protection product (IIIA 4)

Applicant: Luxan B.V. (Excel Industries Ltd)
Tradenames: Endosulfan 35 EC, Endocel 35 EC and Endo 35 EC

B.3.5.1c Packaging and compatibility with packaging materials

Endocel 35 EC is packed in UN approved MS drums of 200 lits capacity, suitably lacquered from inside.

For sale in EU information will be given later.

¡Error! Marcador no definido.**B.3.5.1.1c Full description of materials used, manner of construction, size of opening, type of closure and seals**

No data was submitted

¡Error! Marcador no definido.**B.3.5.1.2c Suitability of the packaging, including closures, in terms of strength, leakproofness and resistance to normal transport and handling**

No data was submitted

¡Error! Marcador no definido.**B.3.5.1.3c Resistance of the packaging material to its contents**

No data was submitted

B.3.5.2c Procedures for cleaning application equipment

Rinsing with water and detergents. **It should be taken into account the Endosulfan toxicity for aquatic organism. Therefore, care should be taken not to rinse contaminated washings from application equipment into waste water channels. Contaminated cleaning liquids should be disposed of safely according to local regulations. Objects made of absorbent material and not properly cleanable should be disposed of.**

B.3.5.3c Re-entry periods, necessary waiting periods or other precautions to protect man, livestock and the environment

The PHI intervals is given by WHO/FAO. Re-entry or further waiting periods are not proposed.

Contary with the applicant opinion crops should not be re-entered within one day after application.

The preharvest interval (PHI) period were fixed according to the residue data submitted and are the following:

Crop/Commodity	Pre-harvest interval (days)
Oranges	21
Lemons	21
Mandarins	21
Tree nuts	21
Pome fruits	21 N, 14 S
Stone fruits	21
Grapes	70 N, 28 S
Strawberries	37-66 *
Cane fruits	21
Currants	70
Tomatoes	7 N, 3 S
Peppers	7 N, 3 S
Cucurbits	7
Beans and peas with and with out pods	14-21
Dry peas	28
Oilseed rape	56
Sunflower	63
Soyabean	30
Cotton	15
Potatoes	14
Wheat	28
Maize	70
Tea	7
Coffee	30
Cacao	28

*According to phenological state

B.3.5.4c Recommended methods and precautions concerning handling, storage, transport or fire

Hazards identifications:

Toxic if swallowed or spilled on skin.

Causes skin and eye irritation.

Do not contaminate eyes or skin.

Do not breathe vapour or spray mist.

Wear procetive clothing including respiratory mask, rubber gloves, and face shields or goggles.
Do not spray against wind.
Do not eat, drink or smoke while handling.
Do not blow clogged nozzles with mouth, use a brush.
Wash with soap and water and changes clothes after application.
Observe recommended waiting periods (harvest intervals).
Keep animals and bystanders out of areas being treated.
Strongly toxic to fish.
Keep out of fish bearing and other water sources.
Excerise appropriate care when cleaning equipment and/or disposeing of waste.
May be harmful to wild life.
Store product in closed original containers under lock and key in a cool dry place away from food, feed, water and out of reach of children and animals.

Inflammable - store away from fire.

Apply all spray solution on the field.
Do not reuse empty containers. Rinse them thoroughly several times and add rinsing to the spraying tank.

Transport information:

ADR/RID: UN no.: 2761 Class 6.1,72(c), Risk No. 60, Label 6.1,Packing group III
IMDG: Class 6.1, Code Page No. 6221, Marine pollutant
ICAO: Class 6.1, 80-8, Pack. ins. pass. Y619/ 10 kg, Cargo 619/ 200 kg

Fire-fighting measures:

Extinguishing media - sprayed water jet, foam, extinguishing powder, and CO2.
Fire-fighting water should be contained.

B.3.5.5c Emergency measures in the case of an accident

Prevent entry into drains, water or soil. Avoid sources of ignition. Take spilled product with absorbed material (e.g. saw dust, peat, chemical binder). Place contaminated absorbed material in cloasabel containers. To clean contaminated loors and objects, wipe with damp cloth. All contaminated cleaning materials should be closable receptacles.

B.3.5.6c Procedures for destruction or decontamination of the plant protection product and its packaging

No data was submitted

B.3.7 References relied on

Annex IIA, or Annex IIIA, point(s)	Year	Author(s) Title Company (insert name) Report No. Source (where different)	GLP GEP Y / N	Published Y / N	Owner	Data Protection
IIA, 3.5.2	1989	Knauf, Werner; Waltersdorfer, Anna The Insecticidal Efficacy of Endosulfandiol (Hoe 051329), Endosulfanlacton (Hoe 051328), Endosulfansulfate (Hoe 051327) in comparison with Endosulfan (Hoe 002671) Hoechst C Produktentwicklung Oekologie 1, Germany. Report No.: A41240	No	No	AgrEvo	No
IIA, 3.8.1	1995	Kuebel Endosulfan substance, technical (Code: Hoe 002671 00 ZD97 0003) Safe disposal and controlled incineration Hoechst Schering AgrEvo GmbH, Logistik Frankfurt. Report No.: A55971	Yes	No	AgrEvo	No
IIIA, 4.1.1	1995	Simon-Hullmann,U., Rexer, K. Endosulfan emulsifiable concentrate 352 g/l. Information on packaging Hoechst Schering AgrEvo, Forsch.Formulierung, Germany. Report No.: A54121	No	No	AgrEvo	No
IIIA, 4.2	1996	Schoeni J.P.; Rexer, K. Endosulfan emulsifiable concentrate 352 g/l (Code: Hoe 002671 00 EC33 B300) Determination of the pourability Hoechst Schering AgrEvo GmbH, Research Formulations, Frankfurt. Report No.: A56408	Yes	No	AgrEvo	No
IIIA, 4.4	1995b	Kuebel Endosulfan, emulsifiable concentrate 352 g/l (Code: Hoe 002671 00 EC33 B300) Procedures to minimize the generation of waste and leftovers Hoechst Schering AgrEvo GmbH, Logistik Frankfurt. Report No.: A55972	Yes	No	AgrEvo	No
IIIA, 4.6.2	1985a	Dehmer; Albrecht; Endosulfan Emulsifiable Concentrate 352 g/l Hoechst Pfl.Formul., Germany. Report No.: A30561	No	No	AgrEvo	No

Annex IIA, or Annex IIIA, point(s)	Year	Author(s) Title Company (insert name) Report No. Source (where different)	GLP GEP Y / N	Published Y / N	Owner	Data Protection
IIIA, 4.6.2	1985b	Dehmer; Albrecht; Endosulfan Emulsifiable Concentrate 352 g/l Hoechst Pfl.Formul., Germany. Report No.: A30562	No	No	AgrEvo	No
IIIA, 4.6.2	1995a	Kuebel Endosulfan, emulsifiable concentrate 352 g/l (Code: Hoe 002671 00 EC33 B300) Safe disposal and controlled incineration Hoechst Schering AgrEvo GmbH, Logistik Frankfurt. Report No.: A55970	Yes	No	AgrEvo	No
IIIA, 4.6.3	1996	Rexer K. Endosulfan, emulsifiable concentrate 352 g/l (Code: Hoe 002671 00 EC33 B300) Guidelines for decontamination and disposal of empty containers Hoechst Schering AgrEvo GmbH, Research Formulations, Frankfurt. Report No.: A56063	Yes	No	AgrEvo	No

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