

## **Instructions for using the workbook**

The information required for the exposure assessment needs to be entered in the worksheet "**Data entry**".

In the following worksheets formulas calculate the exposure values automatically

Worksheet "**Operator Outdoor Spray AOEM**" is to be for outdoor spray applications. PPE options can be selected in this worksheet

Worksheet "**Operator Granules**" is for granular applications. Currently the calculator does not allow operator exposure for indoor applications. PPE options can be selected in this worksheet

Worksheets "**Resident exposure**" and "**Bystander exposure**" are only relevant for outdoor applications

Worksheet "**Recreational Exposure**" is only applicable for golf course, turf, other sports lawns or amenity turf/grassland areas where members of the public are likely to have access

The combined results of the exposure assessment are presented in worksheet "**Summary**"

This calculator should be used in conjunction with the **Guidance on the Assessment of Exposure for Operators, Workers, Residents and Bystanders in Risk Assessment for Plant Protection Products**

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Note: Some drop-down menus depend on others. To avoid errors, please fill-in from top to bottom

<b>Substance name</b>	emamectin benzoaat	
<b>Product name</b>	Affirm	
<b>Reference value non acutely toxic active substance (RVNAS)</b>	0,0014	mg/kg bw/day
<b>Reference value acutely toxic active substance (RVAAS)</b>	0,0014	mg/kg bw/day
<b>Crop type</b>	Pome fruit	
<b>Substance properties</b>	Wettable granules, soluble granules	
Formulation type	Wettable granules, soluble granules	
Minimum volume water for application (liquids)	500	L/ha
Maximum application rate of active substance	0,0285	kg a.s. /ha
50% Dissipation Time DT50	30	days
Initial Dislodgeable Foliar Residue	3	µg/cm2 of foliage/kg a.s. applied/ha
Dermal absorption of product	1,00%	
Dermal absorption of in-use dilution	2,00%	
Oral absorption of active substance	55,00%	
Inhalation absorption of active substance	100,00%	
Vapour pressure of active substance	low volatile substances having a vapour pressure of <math><5 \cdot 10^{-3}</math>Pa	
<b>Scenario</b>	Outdoor	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Vehicle-mounted	
Buffer strip	5	m
Number of applications	2	
Interval between multiple applications	7	days
Season (upward spraying orchards only)	late (dense foliage)	

### Exposure assessment

Substance	emamectin benzoaat	Formulation = Wetttable granules, soluble granules	Application rate-0,0285 kg a.s. /ha	Spray dilution = 0,057 g a.s./l	Vapour pressure = low volatile substances having a vapour pressure of <5*10 <sup>-3</sup> Pa
Scenario	Pome fruit late (dense foliage) / Outdoor / Upward spraying / Vehicle-mounted			Buffer = 5	Number applications = 2, Application interval = 7 days
Percentage Absorption	Dermal for product = 1	Dermal for in use dilution = 2	Oral = 55	Inhalation = 100	
RVNAS	0,0014 mg/kg bw/day		RVAAS	0,0014 mg/kg bw/day	
DFR	3 µg a.s./cm <sup>2</sup> per kg a.s./ha		DT50	30 days	

<b>Operator Model</b>					
Mixing, loading and application AOEM					
Potential exposure	Longer term systemic exposure mg/kg bw/day		0,0023	% of RVNAS	167,40%
	Acute systemic exposure mg/kg bw/day		0,0131	% of RVAAS	933,84%
Mixing and Loading	Gloves = No		Clothing = Work wear - arms, body and legs covered	RPE = None	Soluble bags = No
Application	Gloves = No		Clothing = Work wear - arms, body and legs covered	RPE = None	Closed cabin = No
Exposure (including PPE options above)	Longer term systemic exposure mg/kg bw/day		0,0014	% of RVNAS	102,37%
	Acute systemic exposure mg/kg bw/day		0,0064	% of RVAAS	453,83%

<b>Worker - Searching, reaching, picking</b>	Potential exposure mg/kg bw/day		0,0095	% of RVNAS	678,14%
	Working clothing mg/kg bw/day		0,0019	% of RVNAS	135,63%
	Working clothing and gloves mg/kg bw/day		0,0009	% of RVNAS	67,81%

<b>Resident - child</b>	Spray drift (75th percentile) mg/kg bw/day		0,0002	% of RVNAS	11,95%
	Vapour (75th percentile) mg/kg bw/day		0,0011	% of RVNAS	76,43%
	Surface deposits (75th percentile) mg/kg bw/day		0,0000	% of RVNAS	3,00%
	Entry into treated crops (75th percentile) mg/kg bw/day		0,0002	% of RVNAS	12,72%
	All pathways (mean) mg/kg bw/day		0,0013	% of RVNAS	95,83%
<b>Resident - adult</b>	Spray drift (75th percentile) mg/kg bw/day		0,0001	% of RVNAS	6,41%
	Vapour (75th percentile) mg/kg bw/day		0,0002	% of RVNAS	16,43%
	Surface deposits (75th percentile) mg/kg bw/day		0,0000	% of RVNAS	0,55%
	Entry into treated crops (75th percentile) mg/kg bw/day		0,0001	% of RVNAS	7,06%
	All pathways (mean) mg/kg bw/day		0,0004	% of RVNAS	26,61%

<b>Bystander - child</b>	Spray drift (95th percentile) mg/kg bw/day		0,0004	% of RVAAS	27,26%
	Vapour (95th percentile) mg/kg bw/day		0,0011	% of RVAAS	76,43%
	Surface deposits (95th percentile) mg/kg bw/day		0,0001	% of RVAAS	7,65%

**Exposure assessment**

	Entry into treated crops (95th percentile) mg/kg bw/day	0,0002	% of RVAAS	12,72%
<b>Bystander - adult</b>	Spray drift (95th percentile) mg/kg bw/day	0,0002	% of RVAAS	14,65%
	Vapour (95th percentile) mg/kg bw/day	0,0002	% of RVAAS	16,43%
	Surface deposits (95th percentile) mg/kg bw/day	0,0000	% of RVAAS	1,53%
	Entry into treated crops (95th percentile) mg/kg bw/day	0,0001	% of RVAAS	7,06%
<b>Recreational Exposure</b>		Child % of RVNAS		Adult % of RVNAS

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**Operator exposure for Affirm outdoor spray applications**

Application rate of active substance	0,0285 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	10 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	0,285 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	2,00%	<i>i_AbsorInuse</i>
Formulation type	Wettable granules, soluble granules	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Vehicle-mounted	
Season	late (dense foliage)	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 <sup>th</sup> centile	95 <sup>th</sup> centile		
		Hands	499		
Body	511	11160	AOEM		
Head	2	473	AOEM		
Protected hands (gloves)	7	9	AOEM		
Protected body (workwear or protective garment and sturdy footwear)	6	18	AOEM		
Protected head (hood and face shield)	0	27	AOEM		
Inhalation	26	252	AOEM		
<b>Protective Equipment</b>	Select for inclusion		Penetration factor	Inhalation Protection factor	
Gloves	No				
Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model		
Head and respiratory PPE	None		1	1	
Water soluble bag	No		1		

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 <sup>th</sup> centile	95 <sup>th</sup> centile		
		Hands	829		
Body	2511	14654	AOEM		
Head	330	2026	AOEM		
Protected hands (gloves)	10	262	AOEM		
Protected body (workwear or protective garment and sturdy footwear)	33	64	AOEM		
Inhalation	31	24	AOEM		
<b>Protective Equipment</b>	Select for inclusion		Penetration factor	Inhalation Protection factor	
Gloves	No				
Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model		
Head and respiratory PPE	None		1	1	
Closed cab	No		vehicle mounted upward spraying only		

1. Total	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	0,1406135	0,0859925
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0023436	0,0014332
% of RVNAS	167,40%	102,37%

Acute			
Total systemic exposure from mixing, loading and application (mg a.s./day)	0,7844247	0,3812141	

Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0130737	0,0063536	
% of RVAAS	933,84%	453,83%	

## 2. Longer term exposure

### 2.1 Mixing and loading

	Systemic exposure [ $\mu\text{g a.s. /day}$ ]	Systemic exposure [ $\mu\text{g a.s./kg bw/day}$ ]	Formula
<b>Without RPE/PPE</b>			
Hands	4,9877332	0,0831289	$D15*i\_AbsorpProduct$
Body	5,1107436	0,0851791	$D16*i\_AbsorpProduct$
Head	0,0185061	0,0003084	$D17*i\_AbsorpProduct$
Inhalation	25,7011070	0,4283518	$D21*i\_AbsorpInhalation$
Sum	35,8180900	0,5969682	
<b>With RPE/PPE (as selected above)</b>			
Hands	4,9877332	0,0831289	$D18*i\_AbsorpProduct$
Body	0,0611225	0,0010187	$D19*i\_AbsorpProduct$ or $D15*i\_AbsorpProduct*F24$
Head	0,0185061	0,0003084	$D20*i\_AbsorpProduct$ or $D17*i\_AbsorpProduct*F25$
Inhalation	25,7011070	0,4283518	$D21*i\_AbsorpInhalation*G25$
Sum	30,7684688	0,5128078	
Water soluble bag	30,7684688	0,5128078	$C70*F26$

### 2.2 Application

	Systemic exposure [ $\mu\text{g a.s. /day}$ ]	Systemic exposure [ $\mu\text{g a.s./kg bw/day}$ ]	Formula
<b>Without RPE/PPE</b>			
Hands	16,5799330	0,2763322	$D30*i\_AbsorpInuse$
Body	50,2267244	0,8371121	$D31*i\_AbsorpInuse$
Head	6,6006219	0,1100104	$D32*i\_AbsorpInuse$
Inhalation	31,3881394	0,5231357	$D35*i\_AbsorpInhalation$
Sum	104,7954187	1,7465903	
<b>With RPE/PPE (as selected above)</b>			
Hands	16,5799330	0,2763322	$D33*i\_AbsorpInuse$
Body	0,6553071	0,0109218	$D34*i\_AbsorpInuse$ or $D31*i\_AbsorpInuse*F38$
Head	6,6006219	0,1100104	$D32*i\_AbsorpInuse*F39$
Inhalation	31,3881394	0,5231357	$D35*i\_AbsorpInuse*G39$
Sum	55,2240014	0,9204000	

## 3. Acute exposure

### 3.1 Mixing and loading

	Systemic exposure [ $\mu\text{g a.s. /day}$ ]	Systemic exposure [ $\mu\text{g a.s./kg bw/day}$ ]	Formula
<b>Without RPE/PPE</b>			
Hands	23,5242083	0,3920701	$E15*i\_AbsorpProduct$
Body	111,5962974	1,8599383	$E16*i\_AbsorpProduct$
Head	4,7303673	0,0788395	$E17*i\_AbsorpProduct$
Inhalation	251,8790641	4,1979844	$E21*i\_AbsorpInhalation$
Sum	391,7299371	6,5288323	
<b>With RPE/PPE (as selected above)</b>			
Hands	23,5242083	0,3920701	$E18*i\_AbsorpProduct$
Body	0,1773147	0,0029552	$E19*i\_AbsorpProduct$ or $E16*i\_AbsorpProduct*F24$
Head	4,7303673	0,0788395	$E20*i\_AbsorpProduct$ or $E17*i\_AbsorpProduct*F25$
Inhalation	251,8790641	4,1979844	$E21*i\_AbsorpInhalation*G25$
Sum	280,3109544	4,6718492	
Water soluble bag	280,3109544	4,6718492	$C104*F26$

### 2.2 Application

	Systemic exposure [ $\mu\text{g a.s. /day}$ ]	Systemic exposure [ $\mu\text{g a.s./kg bw/day}$ ]	Formula
<b>Without RPE/PPE</b>			
Hands	35,5496112	0,5924935	$E30*i\_AbsorpInuse$

Body	293,0723560	4,8845393	<i>E31*i_Absorplnuse</i>
Head	40,5111765	0,6751863	<i>E32*i_Absorplnuse</i>
Inhalation	23,5616044	0,3926934	<i>E35*i_Absorplnhalation</i>
Sum	392,6947482	6,5449125	
<b>With RPE/PPE (as selected above)</b>			
Hands	35,5496112	0,5924935	<i>E33*i_Absorplnuse</i>
Body	1,2807809	0,0213463	<i>E34*i_Absorplnuse or E31*i_Absorplnuse*F38</i>
Head	40,5111765	0,6751863	<i>E32*i_Absorplnuse*F39</i>
Inhalation	23,5616044	0,3926934	<i>E35*i_Absorplnhalation*G39</i>
Sum	100,9031731	1,6817196	

**Operator exposure for Affirm granular applications**

Application rate of active substance	0,0285 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	10 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	0,285 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	2,00%	<i>i_AbsorInuse</i>
Formulation type	Wettable granules, soluble granules	
Indoor or Outdoor application	Outdoor <b>This sheet is only to be used for granular applications</b>	
Application method	Upward spraying	
Application equipment	Vehicle-mounted	

	Exposure values	mg exposure/kg a.s. mixed and loaded		Reference	Comment
		75 <sup>th</sup> centile	95 <sup>th</sup> centile		
Mixing and loading	Hands	#N/A	#N/A	#N/A	#N/A
	Body	#N/A	#N/A	#N/A	#N/A
	Inhalation	#N/A	#N/A	#N/A	#N/A
	<b>Protective Equipment</b>	Choose item		Penetration factor	
	Gloves	Chemical resistant gloves			Protection for granules exposure is based on measured values
	Body PPE	Certified protective coverall			
	RPE	None		1	

	Exposure values	mg exposure/kg a.s. applied		Reference	Comment
		75 <sup>th</sup> centile	95 <sup>th</sup> centile		
Application	Hands	#N/A	#N/A	#N/A	#N/A
	Body	#N/A	#N/A	#N/A	#N/A
	Inhalation	#N/A	#N/A	#N/A	#N/A
	<b>Protective Equipment</b>	Choose item		Penetration factor	
	Gloves	Chemical resistant gloves			Protection for granules exposure is based on measured values
	Body PPE	Certified protective coverall			
	RPE	FP1, P1 and similar		0,25	

**1. Total**

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	#N/A	#N/A
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	#N/A	#N/A
% of RVNAS	#N/A	#N/A

Acute			
Total systemic exposure from mixing, loading and application (mg a.s./day)	#N/A	#N/A	



Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	#N/A	#N/A
% of RVAAS	#N/A	#N/A

## 2. Longer term exposure

### 2.1 Mixing and loading

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula
<b>Without RPE/PPE</b>			
Hands	#N/A	#N/A	$D14*100*i\_AmoutAS*i\_AbsorpProduct$
Body	#N/A	#N/A	$D15*100*i\_AmoutAS*i\_AbsorpProduct$
Inhalation	#N/A	#N/A	$D16*i\_AmoutAS*i\_AbsorpInhalation$
Sum	#N/A	#N/A	
<b>With RPE/PPE (as selected above)</b>			
Hands	#N/A	#N/A	$D14*i\_AmoutAS*i\_AbsorpProduct$
Body	#N/A	#N/A	$D15*i\_AmoutAS*i\_AbsorpProduct$
Inhalation	#N/A	#N/A	$D16*i\_AmoutAS*i\_AbsorpInhalation*F20$
Sum	#N/A	#N/A	

### 2.2 Application

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula
<b>Without RPE/PPE</b>			
Hands	#N/A	#N/A	$D25*100*i\_AmoutAS*i\_Absorpnuse$
Body	#N/A	#N/A	$D26*100*i\_AmoutAS*i\_Absorpnuse$
Inhalation	#N/A	#N/A	$D27*i\_AmoutAS*i\_Absorpnuse$
Sum	#N/A	#N/A	
<b>With RPE/PPE (as selected above)</b>			
Hands	#N/A	#N/A	$D25*i\_AmoutAS*i\_Absorpnuse$
Body	#N/A	#N/A	$D26*i\_AmoutAS*i\_Absorpnuse$
Inhalation	#N/A	#N/A	$D27*i\_AmoutAS*i\_Absorpnuse*F31$
Sum	#N/A	#N/A	

## 3. Acute exposure

### 3.1 Mixing and loading

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula
<b>Without RPE/PPE</b>			
Hands	#N/A	#N/A	$E14*100*i\_AmoutAS*i\_AbsorpProduct$
Body	#N/A	#N/A	$E15*100*i\_AmoutAS*i\_AbsorpProduct$
Inhalation	#N/A	#N/A	$E16*i\_AmoutAS*i\_AbsorpInhalation$
Sum	#N/A	#N/A	
<b>With RPE/PPE (as selected above)</b>			
Hands	#N/A	#N/A	$E14*100*i\_AmoutAS*i\_AbsorpProduct$
Body	#N/A	#N/A	$E15*100*i\_AmoutAS*i\_AbsorpProduct$
Inhalation	#N/A	#N/A	$E16*i\_AmoutAS*i\_AbsorpInhalation*F20$
Sum	#N/A	#N/A	

### 3.2 Application

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula
<b>Without RPE/PPE</b>			
Hands	#N/A	#N/A	$E25*100*i\_AmoutAS*i\_Absorpnuse$
Body	#N/A	#N/A	$E25*100*i\_AmoutAS*i\_Absorpnuse$

Inhalation	#N/A	#N/A	$E26 * i\_AmoutAS * i\_Absorplhalation$
Sum	#N/A	#N/A	
<b>With RPE/PPE (as selected above)</b>			
Hands	#N/A	#N/A	$E25 * 100 * i\_AmoutAS * i\_Absorplnuse$
Body	#N/A	#N/A	$E26 * 100 * i\_AmoutAS * i\_Absorplnuse$
Inhalation	#N/A	#N/A	$E27 * i\_AmoutAS * i\_Absorplhalation * F31$
Sum	#N/A	#N/A	



## Worker exposure from residues on foliage for Affirm

Crop type	Pome fruit	
Indoor or outdoor	Outdoor	
Application method	Upward spraying	
Application equipment	Vehicle-mounted	
Worker's task	Searching, reaching, picking	
Main body parts in contact with foliage	Hand and body	
Application rate of active substance	0,0285 kg a.s./ha	<i>i_AppRate</i>
Number of applications	2	<i>i_AppNo</i>
Interval between multiple applications	7 days	<i>i_AppInt</i>
Half-life of active substance	30 days	<i>d_HalfLifeAS</i>
Multiple application factor	1,9	<i>d_MAF</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of the in-use dilution	2,00%	<i>i_AbsorpInuse</i>
Dislodgeable foliar residue ( $i\_AppRate * i\_DFR$ )	0,0855 $\mu\text{g a.s./cm}^2$	<i>d_DFR</i>
Working hours	8 hr	<i>d_WorkHr</i>
Dermal transfer coefficient - Total potential exposure	22500 $\text{cm}^2/\text{hr}$	<i>d_DermTcUCV</i>
Dermal transfer coefficient - arms, body and legs covered	4500 $\text{cm}^2/\text{hr}$	<i>d_DermTcCV1</i>
Dermal transfer coefficient - hands, arms, body and legs covered	2250 $\text{cm}^2/\text{hr}$	<i>d_DermTcCV2</i>
Inhalation transfer coefficient for automated applications	NA $\text{ha/hr} * 10^{(-3)}$	<i>d_InhalTcAut</i>
Inhalation transfer coefficient for cutting ornamentals	NA $\text{ha/hr} * 10^{(-3)}$	<i>d_InhalTcCut</i>
Inhalation transfer coefficient for sorting / bundling ornamentals	NA $\text{ha/hr} * 10^{(-3)}$	<i>d_InhalTcSort</i>

### 1. Total

	Potential exposure	Work wear - arms, body and legs covered	Working wear and gloves	Comments
Total systemic exposure (mg a.s./day)	0,5696354	0,1139271	0,0569635	
Total systemic exposure per kg body weight (mg/kg bw/day)	0,0094939	0,0018988	0,0009494	
% of RVNAS	678,14%	135,63%	67,81%	

### 2. Details

	Systemic exposure		Formula	Comments
	[mg a.s. /day]	[mg a.s./kg bw/day]		
Dermal - Potential	0,5696354	0,0094939	$d\_DermTcUCV * d\_WorkHr * i\_DFR * i\_MAF / 1000 * i\_AbsorpInuse$	
Dermal - Work wear - arms, body and legs covered	0,1139271	0,0018988	$d\_DermTcCV1 * d\_WorkHr * d\_DFR * d\_MAF / 1000 * i\_AbsorpInuse$	
Dermal - Working wear and gloves	0,0569635	0,0009494	$d\_DermTcCV2 * d\_WorkHr * d\_DFR * d\_MAF / 1000 * i\_AbsorpInuse$	
Inhalation				Na for outdoor activities

## Resident exposure for Affirm

Croptype	Pome fruit	
Application method	Upward spraying	
Application equipment	Vehicle-mounted	<i>i_AppEquip</i>
Formulation type	Wettable granules, soluble granules	<i>i_FormVal</i>
Buffer strip	5 m	<i>i_Buffer</i>
Application rate of the product	0,0285 kg a.s./ha	<i>i_AppRate</i>
Concentration of active substance (in-use dilution for liquid applications)	0,057 g a.s./l	<i>d_ConcAS</i>
Dermal absorption of product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	2,00%	<i>i_AbsorpInuse</i>
Oral absorption	55,00%	<i>i_AbsorpOrallnuse</i>
Dislodgeable foliar residue ( $i\_AppRate * i\_DFR$ )	0,0855 $\mu\text{g a.s./cm}^2$	<i>d_DFR</i>
Vapour pressure of in-use dilution	low volatile substances having a vapour pressure of $<5 * 10^{-3} \text{Pa}$	<i>i_Volat</i>
Concentration in air	0,001 $\text{mg/m}^3$	<i>d_AirCon</i>
Resident dermal spray drift exposure 75th percentile - adult	5,63 ml spray dilution/person	
Resident dermal spray drift exposure 75th percentile - child	1,689 ml spray dilution/person	
Resident inhal. spray drift exposure 75th percentile - adult	0,00210 ml spray dilution/person	
Resident inhal. spray drift exposure 75th percentile - child	0,00164 ml spray dilution/person	
Resident dermal spray drift exposure mean - adult	3,68 ml spray dilution/person	
Resident dermal spray drift exposure mean - child	1,11 ml spray dilution/person	
Resident inhal. spray drift exposure mean - adult	0,00170 ml spray dilution/person	
Resident inhal. spray drift exposure mean - child	0,00133 ml spray dilution/person	
Exposure duration dermal	2 hours	<i>d_ReExpDur</i>
Exposure duration inhalation	24 hours	<i>d_ReExpDurInhal</i>
Exposure duration entry into treated crops	0,25 hours	<i>d_ExpDurTreatCrop</i>
Light clothing adjustment factor	18,0%	<i>d_ClothAF</i>
Breathing rate adult	0,23 $\text{m}^3/\text{day}/\text{kg}$	<i>d_BreathRAD</i>
Breathing rate child (1-3 year old)	1,07 $\text{m}^3/\text{day}/\text{kg}$	<i>d_BreathRCh</i>
Drift percentage on surface (75th percentile)	6,04%	
Drift percentage on surface (mean)	3,73%	
Turf transferable residues percentage	5,00%	<i>d_Turf</i>
Transfer coeff. of surface deposits-adult	7300 $\text{cm}^2/\text{hour}$	<i>d_ReTCAd</i>
Transfer coeff. of surface deposits-child (1-3 year old)	2600 $\text{cm}^2/\text{hour}$	<i>d_ReTCCh</i>
Saliva extraction percentage	50,00%	<i>d_SalExt</i>
Surface area of hands mouthed	20 $\text{cm}^2$	<i>d_AreaHM</i>
Frequency of hand to mouth activity	9,5 events/hour	<i>d_ReFreqHM</i>
Ingestion rate for mouthing of grass per day	25 $\text{cm}^2$	<i>d_MouthGrass</i>
Dislodgeable residues percentage transferability for object to mouth	20,00%	<i>d_DRP</i>
Transfer coefficient for entry into treated crops (75th percentile) - adult	7500 $\text{cm}^2/\text{h}$	<i>d_TcEntryAd</i>
Transfer coefficient for entry into treated crops (75th percentile) - child	2250 $\text{cm}^2/\text{h}$	<i>d_TcEntryCh</i>
Transfer coefficient for entry into treated crops (mean) - adult	5980 $\text{cm}^2/\text{h}$	<i>d_TcEntryAd</i>
Transfer coefficient for entry into treated crops (mean) - child	1794 $\text{cm}^2/\text{h}$	<i>d_TcEntryCh</i>

1. Total

1.1 1-3 year old child

	Spray drift (75th percentile)	Vapour (75th percentile)	Surface deposits (75th percentile)	Entry into treated crops (75th percentile)	All pathways (mean)
Total systemic exposure (mg a.s./day)	0,0016726	0,0107000	0,0004197	0,0017801	0,0134162
Total systemic exposure per kg body weight (mg/kg bw/day)	0,0001673	0,0010700	0,0000420	0,0001780	0,0013416
% of RVNAS	11,95%	76,43%	3,00%	12,72%	95,83%

1.2 Adult

	Spray drift	Vapour	Surface deposits	Entry into treated crops	All pathways (mean)
Total systemic exposure (mg a.s./day)	0,0053826	0,0138000	0,0004651	0,0059337	0,0223553
Total systemic exposure per kg body weight (mg/kg bw/day)	0,0000897	0,0002300	0,0000078	0,0000989	0,0003726
% of RVNAS	6,41%	16,43%	0,55%	7,06%	26,61%

2. Resident exposure 75th Percentile

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula	Comments
<b>1-3 year old child</b>				
Spray drift	0,0016726	0,0001673	$((C16 * i\_AbsorpInuse * (1 - d\_ClothAF)) + C18) * d\_ConcAS$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0107000	0,0010700	$d\_AirCon * d\_BreathRCh * d\_BwChild$	
Surface deposits				
Dermal	0,0001657	0,0000166	$(i\_AppRate/100) * C29 * d\_Turf * d\_ReTCCh * d\_ReExpDur * MAX(i\_AbsorpProduct, i\_AbsorpInuse) * d\_MAF * IF(i\_AppEquip = "Vehicle-mounted-Drift Reduction", 0.5, 1)$	
Hand to mouth	0,0001665	0,0000166	$(i\_AppRate/100) * C29 * d\_Turf * d\_SalExt * d\_AreaHM * d\_ReFreqHM * d\_ReExpDur * i\_AbsorpOrallnuse * d\_MAF$	
Object to mouth	0,0000876	0,0000088	$(i\_AppRate/100) * C29 * d\_DRP * d\_MouthGrass * i\_AbsorpOrallnuse * d\_MAF$	



Entry into treated crops				
Dermal	0,0017801	0,0001780	$(d\_TcEntryCh*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_Absorplnuse)$	
Hand to mouth			$(i\_AppRate/100)*d\_Turf*d\_MAF*d\_SalExt*d\_AreaHM*d\_ReFreqHM*d\_ReExpDur*i\_AbsorpOrallnuse$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
Object to mouth			$(i\_AppRate/100)*d\_DRP*d\_MouthGrass*i\_AbsorpOrallnuse*d\_MAF$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
<b>Adult</b>				
Spray drift	0,0053826	0,0000897	$(C15*i\_Absorplnuse*(1-d\_ClothAF))+C17)*d\_ConcAS$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0138000	0,0002300	$d\_AirCon*d\_BreathRAD*d\_BwAdult$	
Surface deposits (dermal)	0,0004651	0,0000078	$(i\_AppRate/100)*C30*d\_Turf*d\_ReTCA*d\_ReExpDur*i\_Absorplnuse$	
Entry into treated crops (dermal)	0,0059337	0,0000989	$(d\_TcEntryAd*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_Absorplnuse)$	

### 3. Summing of exposure pathways mean

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula	Comments
<b>1-3 year old child</b>				
Spray drift	0,0010376	0,0001038	$((C20*i\_Absorplnuse*(1-d\_ClothAF))+C22)*d\_ConcAS$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0107000	0,0010700	$d\_AirCon*d\_BreathRCh*d\_BwChild$	
Surface deposits				
Dermal	0,0001023	0,0000102	$(i\_AppRate/100)*C30*d\_Turf*d\_ReTCC*d\_ReExpDur*MAX(i\_AbsorpProduct,i\_Absorplnuse)*d\_MAF*IF(i\_AppEquip = "Vehicle-mounted-Drift Reduction",0.5,1)$	
Hand to mouth	0,0001028	0,0000103	$(i\_AppRate/100)*C30*d\_Turf*d\_SalExt*d\_AreaHM*d\_ReFreqHM*d\_ReExpDur*i\_AbsorpOrallnuse*d\_MAF$	
Object to mouth	0,0000541	0,0000054	$(i\_AppRate/100)*C30*d\_DRP*d\_MouthGrass*i\_AbsorpOrallnuse*d\_MAF$	
Entry into treated crops				
Dermal	0,0014193	0,0001419	$(d\_TcEntryMeanCh*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_Absorplnuse)$	
Hand to mouth			$(i\_AppRate/100)*1*d\_Turf*d\_MAF*d\_SalExt*d\_AreaHM*d\_ReFreqHM*d\_ReExpDur*i\_AbsorpOrallnuse$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
Object to mouth			$(i\_AppRate/100)*1*d\_DRP*d\_MouthGrass*i\_AbsorpOrallnuse*d\_MAF$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
<b>Adult</b>				
Spray drift	0,0035370	0,0000589	$"(C19*i\_Absorplnuse*(1-d\_ClothAF))+C21)*d\_ConcAS"$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0138000	0,0002300	$d\_AirCon*d\_BreathRAD*d\_BwAdult$	
Surface deposits (dermal)	0,0002872	0,0000048	$(i\_AppRate/100)*C30*d\_Turf*d\_ReTCA*d\_ReExpDur*MAX(i\_AbsorpProduct,i\_Absorplnuse)*d\_MAF*IF(i\_AppEquip = "Vehicle-mounted-Drift Reduction",0.5,1)$	
Entry into treated crops (dermal)	0,0047311	0,0000789	$(d\_TcEntryMeanAd*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_Absorplnuse)$	

## Bystander exposure for Affirm

Croptype	<b>Pome fruit</b>	
Application method	<b>Upward spraying</b>	
Application equipment	<b>Vehicle-mounted</b>	<i>i_AppEquip</i>
Formulation type	<b>Wettable granules, soluble granules</b>	
Application rate of the product	<b>0,0285</b> kg a.s./ha	<i>i_AppRate</i>
Buffer strip	<b>5</b> m	<i>i_Buffer</i>
Concentration of active substance (in-use dilution for liquid applications)	<b>0,057</b> g a.s./l	<i>d_ConcAS</i>
Dermal absorption of product	<b>1,00%</b>	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	<b>2,00%</b>	<i>i_AbsorpInuse</i>
Oral absorption	<b>55,00%</b>	<i>i_AbsorpOrallnuse</i>
Dislodgeable foliar residue ( $i\_AppRate \cdot i\_DFR$ )	<b>0,0855</b> µg a.s./cm <sup>2</sup>	<i>d_DFR</i>
Vapour pressure of in-use dilution	<b>low volatile substances having a vapour pressure of &lt;5*10<sup>-3</sup>Pa</b> Pa	<i>i_Volat</i>
Concentration in air	<b>0,001</b> mg/m <sup>3</sup>	<i>d_AirCon</i>
Bystander dermal spray drift exposure - adult	<b>12,9</b> ml spray dilution/person	
Bystander dermal spray drift exposure - child	<b>3,87</b> ml spray dilution/person	
Bystander inhal. spray drift exposure - adult	<b>0,00440</b> ml spray dilution/person	
Bystander inhal. spray drift exposure - child	<b>0,00348</b> ml spray dilution/person	
Exposure duration	<b>2</b> hours	<i>d_ByExpDur</i>
Exposure duration entry into treated crops	<b>0,25</b> hours	<i>d_ExpDurTreatCrop</i>
Light clothing adjustment factor	<b>18,0%</b>	<i>d_ClothAF</i>
Breathing rate adult	<b>0,23</b> m <sup>3</sup> /hours/kg	<i>d_BreathRAD</i>
Breathing rate child (1-3 year old)	<b>1,07</b> m <sup>3</sup> /hours/kg	<i>d_BreathRCh</i>
Drift percentage on surface (90th percentile)	<b>8,41%</b>	
Turf transferable residues percentage	<b>5,00%</b>	<i>d_Turf</i>
Transfer coeff. of surface deposits-adult	<b>14500</b> cm <sup>2</sup> /hour	<i>d_ByTCAd</i>
Transfer coeff. of surface deposits-child (1-3 year old)	<b>5200</b> cm <sup>2</sup> /hour	<i>d_ByTCCh</i>
Saliva extraction percentage	<b>50,00%</b>	<i>d_SalExt</i>
Surface area of hands mouthed	<b>20</b> cm <sup>2</sup>	<i>d_AreaHM</i>
Frequency of hand to mouth activity	<b>20</b> events/hour	<i>d_ByFreqHM</i>
Ingestion rate for mouthing of grass per day	<b>25</b> cm <sup>2</sup>	<i>d_MouthGrass</i>
Dislodgeable residues percentage transferability for object to mouth	<b>20,00%</b>	<i>d_DRP</i>
Transfer coefficient for entry into treated crops - adult	<b>7500</b> cm <sup>2</sup> /h	<i>d_TcEntryAd</i>
Transfer coefficient for entry into treated crops - child	<b>2250</b> cm <sup>2</sup> /h	<i>d_TcEntryCh</i>

### 1. Total

#### 1.1 1-3 year old child

	Spray drift	Vapour	Surface deposits	Entry into treated crops
Total systemic exposure (mg a.s./day)	<b>0,0038162</b>	<b>0,0107000</b>	<b>0,0010712</b>	<b>0,0017801</b>
Total systemic exposure per kg body weight (mg/kg bw/day)	<b>0,0003816</b>	<b>0,0010700</b>	<b>0,0001071</b>	<b>0,0001780</b>
% of RVAAS	<b>27,26%</b>	<b>76,43%</b>	<b>7,65%</b>	<b>12,72%</b>

#### 1.2 Adult

	Spray drift	Vapour	Surface deposits	Entry into treated crops
Total systemic exposure (mg a.s./day)	<b>0,0123097</b>	<b>0,0138000</b>	<b>0,0012864</b>	<b>0,0059337</b>

Total systemic exposure per kg body weight (mg/kg bw/day)	0,0002052	0,0002300	0,0000214	0,0000989
% of RVAAS	14,65%	16,43%	1,53%	7,06%

## 2. Details

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula	Comments
<b>1-3 year old child</b>				
Spray drift	0,0038162	0,0003816	$((C16 * i\_AbsorpInuse * (1 - d\_ClothAF)) + C18) * d\_ConcAS$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0107000	0,0010700	$d\_AirCon * d\_BreathRCh * d\_BwChild$	
Surface deposits				
Dermal	0,0004613	0,0000461	$(i\_AppRate / 100) * C24 * d\_Turf * d\_ByTCCh * d\_ByExpDur * MAX(i\_AbsorpProduct, i\_AbsorpInuse) * d\_MAF * IF(i\_AppEquip = "Vehicle-mounted-Drift Reduction", 0.5, 1)$	
Hand to mouth	0,0004879	0,0000488	$(i\_AppRate / 100) * C25 * d\_Turf * d\_SalExt * d\_AreaHM * d\_ByFreqHM * d\_ByExpDur * i\_AbsorpOralInuse * d\_MAF$	
Object to mouth	0,0001220	0,0000122	$(i\_AppRate / 100) * C25 * d\_DRP * d\_MouthGrass * i\_AbsorpOralInuse * d\_MAF$	

Entry into treated crops				
Dermal	0,0017801	0,0001780	$(d\_TcEntryCh*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_AbsorpInuse)$	
Hand to mouth			$(i\_AppRate/100)*d\_MAF*d\_Turf*d\_SalExt*d\_AreaHM*d\_ByFreqHM*d\_ByExpDur*i\_AbsorpOralInuse$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
Object to mouth			$(i\_AppRate/100)*d\_DRP*d\_MouthGrass*i\_AbsorpOralInuse*d\_MAF$	Considered only for application on grassland and lawns and for application on golf course, turf or other sports lawns.
<b>Adult</b>				
Spray drift	0,0123097	0,0002052	$((C15*i\_AbsorpInuse*(1-d\_ClothAF)t)+C17)*d\_ConcAS$	the only available values are for the 8 m distance downwind from the middle of the tree trunk, which are assumed to represent 5 m distance from the edge of orchard; the same value is used for 5 and 10 m.
Vapour	0,0138000	0,0002300	$d\_AirCon*d\_BreathRA*d\_BwAdult$	
Surface deposits (dermal)	0,0012864	0,0000214	$(i\_AppRate/100)*C24*d\_Turf*d\_ByTCA*d\_ByExpDur*MAX(i\_AbsorpProduct,i\_AbsorpInuse)*d\_MAF*IF(i\_AppEquip="Vehicle-mounted-Drift Reduction",0.5,1)$	
Entry into treated crops (dermal)	0,0059337	0,0000989	$(d\_TcEntryAd*0.25*d\_DFR*d\_MAF)/1000*MAX(i\_AbsorpProduct,i\_AbsorpInuse)$	



## Recreational exposure for Affirm

Croptype		Golf course, turf or other sports lawns		This sheet is only to be used for treatment of grassland used for recreational purposes	
Application method		Upward spraying			
Application equipment		Vehicle-mounted			<i>i_AppEquip</i>
Formulation type		Wettable granules, soluble granules			<i>i_FormVal</i>
Application rate of the product		0,0285	kg a.s./ha		<i>i_AppRate</i>
Dermal absorption of product		1,00%			<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution		2,00%			<i>i_Absorplnuse</i>
Oral absorption		55,00%			<i>i_AbsorpOrallnuse</i>
Dislodgeable foliar residue ( $i\_AppRate \cdot i\_DFR$ )		0,0855	$\mu\text{g a.s./cm}^2$		<i>d_DFR</i>
Exposure duration dermal		2	hours		<i>d_ReExpDur</i>
Light clothing adjustment factor Adult resident		18,0%			<i>d_ClothAF</i>
Drift percentage on surface		100,00%			
Turf transferable residues percentage		5,00%			<i>d_Turf</i>
Transfer coeff. of surface deposits-adult		7300	$\text{cm}^2/\text{hour}$		<i>d_ReTCAd</i>
Transfer coeff. of surface deposits-child (1-3 year old)		2600	$\text{cm}^2/\text{hour}$		<i>d_ReTCCh</i>
Saliva extraction percentage		50,00%			<i>d_SalExt</i>
Surface area of hands mouthed		20	$\text{cm}^2$		<i>d_AreaHM</i>
Frequency of hand to mouth activity		9,5	events/hour		<i>d_ReFreqHM</i>
Ingestion rate for mouthing of grass per day		25	$\text{cm}^2$		<i>d_MouthGrass</i>

## 2. Details

	Systemic exposure [mg a.s. /day]	Systemic exposure [mg a.s./kg bw/day]	Formula	Comments
<b>1-3 year old child</b>				
Surface deposits				
Dermal	0,0027427	0,0002743	$(i\_AppRate/100) \cdot C13 \cdot d\_Turf \cdot d\_ReTCCh \cdot d\_ReExpDur \cdot \text{MAX}(i\_AbsorpProduct, i\_Absorplnuse) \cdot d\_MAF$	
Hand to mouth	0,0027559	0,0002756	$(i\_AppRate/100) \cdot C13 \cdot d\_Turf \cdot d\_SalExt \cdot d\_AreaHM \cdot d\_ReFreqHM \cdot d\_ReExpDur \cdot i\_AbsorpOrallnuse \cdot d\_MAF$	
Object to mouth	0,0014505	0,0001450	$(i\_AppRate/100) \cdot C13 \cdot d\_DRP \cdot d\_MouthGrass \cdot i\_AbsorpOrallnuse \cdot d\_MAF$	
Total systemic exposure	0,0069490	0,0006949		
% of RVNAS				
<b>Adult</b>				
Surface deposits (dermal)	0,0077006	0,0001283	$(i\_AppRate/100) \cdot C13 \cdot d\_Turf \cdot d\_ReTCAd \cdot d\_ReExpDur \cdot \text{MAX}(i\_AbsorpProduct, i\_Absorplnuse) \cdot d\_MAF$	
% of RVNAS				



<i>d_AirConVol</i>	Concentration in air of moderately volatile substances	<b>0,015</b> mg/m <sup>3</sup>
<i>d_AirConNonVol</i>	Concentration in air of low volatile substances	<b>0,001</b> mg/m <sup>3</sup>
<i>d_AreaHM</i>	Surface area of hands mouthed	<b>20</b> cm <sup>2</sup>
<i>d_AreaTreated</i>	Area treated (defined by crop type)	<b>10</b> ha
<i>d_BreathRAd</i>	Breathing rate adult residents	<b>0,23</b> m <sup>3</sup> /day/kg
<i>d_BreathRCh</i>	Breathing rate child (1-3 year old) residents	<b>1,07</b> m <sup>3</sup> /day/kg
<i>d_BwAdult</i>	Adult body weight	<b>60</b> kg
<i>d_BwChild</i>	Child body weight (1 to < 3 year olds)	<b>10</b> kg
<i>d_ByBreathRAd</i>	Breathing rate adult bystander	<b>0,04</b> m <sup>3</sup> /hours/kg
<i>d_ByBreathRCh</i>	Breathing rate child (1-3 year old) bystander	<b>0,19</b> m <sup>3</sup> /hours/kg
<i>d_ByExpDur</i>	Exposure duration intense activity breathing rates	<b>2</b> hours
<i>d_ByFreqHM</i>	Frequency of hand to mouth activity	<b>20</b> events/hour
<i>d_ByTCAd</i>	Transfer coeff. of surface deposits-adult	<b>14500</b> cm <sup>2</sup> /hour
<i>d_ByTCCh</i>	Transfer coeff. of surface deposits-child (1-3 year old)	<b>5200</b> cm <sup>2</sup> /hour
<i>d_ClothAF</i>	Light clothing adjustment factor resident and bystanders	<b>18,0%</b>
<i>d_ConcAs</i>	Concentration of active substance (in-use dilution for liquid applications)	<b>0,057</b> g a.s./l
<i>d_DFR</i>	Dislodgeable foliar residue (i_AppRate*i_DFR)	<b>0,0855</b> µg a.s./cm <sup>2</sup>
<i>d_DRP</i>	Dislodgeable residues percentage transferability for object to mouth	<b>20,0%</b>
<i>d_HalfLifeAS</i>	Half-life of active substance (DT50)	<b>30</b> days
<i>d_InhalTcAut</i>	Inhalation transfer coefficient for automated applications	<b>NA</b> ha/hr*10 <sup>^(-3)</sup>
<i>d_InhalTcCut</i>	Inhalation transfer coefficient for cutting ornamentals	<b>NA</b> ha/hr*10 <sup>^(-3)</sup>
<i>d_InhalTcSort</i>	Inhalation transfer coefficient for sorting / bundling ornamentals	<b>NA</b> ha/hr*10 <sup>^(-3)</sup>
<i>d_MAF</i>	Multiple application factor	<b>1,85</b>
<i>d_MouthGrass</i>	Ingestion rate for mouthing of grass per day	<b>25</b> cm <sup>2</sup> grass/day
<i>d_ReExpDur</i>	Exposure duration resident dermal	<b>2</b> hours
<i>d_ReExpDurInhal</i>	Exposure duration resident inhalation	<b>24</b> hours
<i>d_ExpDurTreatCrop</i>	Exposure duration for resident and bystander entry into treated crops	<b>0,25</b> hours
<i>d_ReFreqHM</i>	Frequency of hand to mouth activity	<b>9,5</b> events/hour
<i>d_ReTCAd</i>	Transfer coeff. of surface deposits-adult	<b>7300</b> cm <sup>2</sup> /hour
<i>d_ReTCCh</i>	Transfer coeff. of surface deposits-child (1-3 year old)	<b>2600</b> cm <sup>2</sup> /hour
<i>d_SalExt</i>	Saliva extraction percentage	<b>50,0%</b>
<i>d_TcEntryAd</i>	Transfer coefficient for entry into treated crops 75th percentile - adult	<b>7500</b> cm <sup>2</sup> /h
<i>d_TcEntryCh</i>	Transfer coefficient for entry into treated crops 75th percentile - child	<b>2250</b> cm <sup>2</sup> /h
<i>d_TcEntryMeanAd</i>	Transfer coefficient for entry into treated crops mean - adult	<b>5980</b> cm <sup>2</sup> /h
<i>d_TcEntryMeanCh</i>	Transfer coefficient for entry into treated crops mean - child	<b>1794</b> cm <sup>2</sup> /h
<i>d_Turf</i>	Turf transferable residues percentage	<b>5,0%</b>
<i>d_PctExtrapolation</i>	For exposure value 75 percentiles above this amount linear extrapolation is performed	<b>1,5</b> kg
<i>d_head75ProtectionFactor</i>	Coefficient to estimate head protection factor 75 th Percentile	<b>1,79422</b>
<i>d_head95ProtectionFactor</i>	Coefficient to estimate head protection factor 95 Percentile	<b>1,24705</b>

*sys\_KeyOperator* Variables for operator exposure lookup key  
*sys\_OperatorModel* Operator model

**i\_IndoorOutdoor&i\_FormVal&i\_AppMeth&i\_AppEquip&**

**1**

RPE reduction factor	
key_MixRPE, ay_MixRPE	
None	1
FP1, P1 and similar	0,25
FP2, P2 and similar	0,1

PPE reduction factor	
key_MixPPEBody, ay_MixPPEBody	
Potential exposure	1
Work wear - arms, body and legs covered	0,1
Certified protective coverall	0,05

PPE reduction factor	
key_MixPPEHead, ay_MixPPEHead	
None	1
Hood	0,5
Hood and visor	0,05
FP1, P1 and similar	0,8
FP2, P2 and similar	0,8

Application: Gloves PPE reduction factor (depending on formulation type)		
key_AppPPEHands, ay_AppPPEHands		
Wettable powder, soluble powder	Chemical resistant gloves	0,05
Granules, fine granules	Chemical resistant gloves	0,05
Wettable granules, soluble granules	Chemical resistant gloves	0,05
Soluble concentrates, emulsifiable concentrate, etc.	Chemical resistant gloves	0,1
Wettable powder, soluble powder	None	1
Granules, fine granules	None	1
Wettable granules, soluble granules	None	1
Soluble concentrates, emulsifiable concentrate, etc.	None	1

Crop dependent exposure parameters										
key_CropType, ay_CropType	Transfer coefficients	Transfer coefficients	2250	Transfer coefficients	Area Treated					
Crop type	Arm, body and legs covered	Total potential exposure	Activity	hours per day	Body parts involved	Hands, arm, body and legs covered	Type of crop for Resident Bystander	Vehicle Mounted Applications		
Bare soil	NA	NA	NA	NA	NA	NA	Field crops	50		
Low berries and other small fruits		3000	5800 Reaching, picking		8 Hand and forearm		750 Field crops	50		
Brassica vegetables		2500	5800 Reaching, picking		8 Hand and body		580 Field crops	50		
Bulb vegetables		2500	5800 Reaching, picking		8 Hand and body		580 Field crops	50		
Cane fruit		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Field crops	10		
Cereals		1400	12500 Inspection, irrigation		2 Hand and body	no TC available for this assessment	Field crops	50		
Citrus fruit		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Fruit crops	10		
Fruiting vegetables		2500	5800 Reaching, picking		8 Hand and body		580 Field crops	50		
Grapes		10100	30000 Hand harvesting		8 Hand and body	no TC available for this assessment	Grapes	10		
Grassland and lawns		1400	12500 Inspection, irrigation		2 Hand and body	no TC available for this assessment	Field crops	50		
Golf course, turf or other sports lawns		2500	5800 Maintenance		8 Hand and body		580 Field crops	50		
Hops		1400	12500 Inspection, irrigation		2 Hand and body	no TC available for this assessment	Hops	10		
Leaf vegetables and fresh herbs		2500	5800 Reaching, picking		8 Hand and body		580 Field crops	50		
Legume vegetables		2500	5800 Reaching, picking		8 Hand and body		580 Field crops	50		
Oilfruits		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Fruit crops	10		
Oilseeds		1400	12500 Inspection, irrigation		2 Hand and body	no TC available for this assessment	Field crops	50		
Ornamentals		5000	14000 Cutting, sorting, bundling, carrying		8 Hand and body		1400 Field crops	10		
Pome fruit		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Fruit crops	10		
Root and tuber vegetables		1400	12500 Inspection, irrigation		2 Hand and body	no TC available for this assessment	Field crops	50		
Stone fruit		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Fruit crops	10		
Tree nuts		4500	22500 Searching, reaching, picking		8 Hand and body		2250 Fruit crops	10		

Resident Spray Drift					
These values are the 75th Percentiles for Residents (assuming average breathing rates for inhalation exposures)					
key_ResidSpray, ay_ResidSpray	Adults Dermal	Children Dermal	Adults Inhalation	Children Inhalation	
Downward spraying2-3		0,47	0,327	0,0001	0,00022
Downward spraying5		0,24	0,22	0,00009	0,00017
Downward spraying10		0,20	0,18	0,00009	0,00013
Upward spraying2-3	NA	NA	NA	NA	
Upward spraying5		5,63	1,689	0,0021	0,00164
Upward spraying10		5,63	1,689	0,0021	0,00164

Bystander Spray Drift					
These values are the 95th Percentiles for Bystanders (assuming high breathing rates for inhalation exposures)					
key_BySpray, ay_BySpray	Adults Dermal	Children Dermal	Adults Inhalation	Children Inhalation	
Downward spraying2-3		1,21	0,74	0,0005	0,0011
Downward spraying5		0,57	0,48	0,00048	0,0008
Downward spraying10		0,48	0,39	0,00051	0,00076
Upward spraying2-3	NA	NA	NA	NA	
Upward spraying5		12,9	3,87	0,0044	0,0035
Upward spraying10		12,9	3,87	0,0044	0,0035

Mean Spray Drift					
These values are the mean values (assuming average breathing rates for inhalation exposures)					
key_AvgSpray, ay_AvgSpray	Adults Dermal	Children Dermal	Adults Inhalation	Children Inhalation	
Downward spraying2-3		0,22	0,18	0,0001	0,0002
Downward spraying5		0,12	0,12	0,0001	0,0001
Downward spraying10		0,11	0,1	0,0001	0,0001
Upward spraying2-3	NA	NA	NA	NA	
Upward spraying5		3,68	1,11	0,0017	0,0013
Upward spraying10		3,68	1,11	0,0017	0,0013

Resident and bystander Surface Deposits Drift percentage			
Ground sediments in % of the application rate calculated on the basis of percentile values (drift data acc. Rautmann)			
key_ByCropType, ay_ByCropType	Bystander surface deposit (90th Percentile)	Resident surface deposit (77th Percentile)	mean
Field cropsnot relevant2-3		0,085	0,056
Field cropsnot relevant5		0,035	0,023
Field cropsnot relevant10		0,019	0,013
Fruit cropsnot relevant2-3		0,292	0,240
Fruit cropsnot relevant5		0,199	0,158
Fruit cropsnot relevant10		0,118	0,090
Fruit cropsearly (without leaves)2-3		0,292	0,240
Fruit cropsearly (without leaves)5		0,199	0,158

Fruit cropsearly (without leaves)10	0,118	0,090	0,061
Fruit cropslate (dense foliage)2-3	0,157	0,110	0,070
Fruit cropslate (dense foliage)5	0,084	0,060	0,037
Fruit cropslate (dense foliage)10	0,036	0,027	0,016
Grapesnot relevant2-3	0,080	0,069	0,053
Grapesnot relevant5	0,036	0,031	0,023
Grapesnot relevant10	0,012	0,010	0,008
Hopsnot relevant2-3	0,193	0,159	0,100
Hopsnot relevant5	0,116	0,086	0,059
Hopsnot relevant10	0,058	0,037	0,029

1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Match Method</b>	<b>Outdoor/Indoor</b>	<b>Formulation type</b>	<b>Application method</b>	<b>Application equipment</b>	<b>Type of exposure</b>	<b>Mixing &amp; Loading 75th percentile</b>	<b>Mixing &amp; Loading 95th percentile</b>	<b>Mixing &amp; Loading Comments</b>	<b>Mixing &amp; Loading Model</b>	<b>Application 75th percentile</b>	<b>Application 95th percentile</b>	<b>Application Comments</b>	<b>Application Model</b>
IndoorGranules, fine granulesApplication of granulesManualBody	Indoor	Granules, fine granules	Application of granules	Manual	Body			Value for application is for combination of mixing&loading and application	PHED	68,8708	253,4438	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
IndoorGranules, fine granulesApplication of granulesManualHands	Indoor	Granules, fine granules	Application of granules	Manual	Hands			Value for application is for combination of mixing&loading and application	PHED	26,5320	94,3636	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
IndoorGranules, fine granulesApplication of granulesManualInhalation	Indoor	Granules, fine granules	Application of granules	Manual	Inhalation			Value for application is for combination of mixing&loading and application	PHED	0,4677	1,5251	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesBroadcast application of granulesVehicle-mountedBody	Outdoor	Granules, fine granules	Broadcast application of granules	Vehicle-mounted	Body	0,0162	0,0427	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED	0,0047	0,0151	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesBroadcast application of granulesVehicle-mountedHands	Outdoor	Granules, fine granules	Broadcast application of granules	Vehicle-mounted	Hands	0,0015	0,0069	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED	0,0004	0,0018	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesBroadcast application of granulesVehicle-mountedInhalation	Outdoor	Granules, fine granules	Broadcast application of granules	Vehicle-mounted	Inhalation	0,0208	0,0784		PHED	0,0012	0,0045		PHED
OutdoorGranules, fine granulesIn furrow application of granulesVehicle-mountedBody	Outdoor	Granules, fine granules	In furrow application of granules	Vehicle-mounted	Body	0,0162	0,0427	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED	0,0047	0,0151	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesIn furrow application of granulesVehicle-mountedHands	Outdoor	Granules, fine granules	In furrow application of granules	Vehicle-mounted	Hands	0,0015	0,0069	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED	0,0004	0,0018	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesIn furrow application of granulesVehicle-mountedInhalation	Outdoor	Granules, fine granules	In furrow application of granules	Vehicle-mounted	Inhalation	0,0208	0,0784		PHED	0,0012	0,0045		PHED
OutdoorGranules, fine granulesManual application of granulesManualBody	Outdoor	Granules, fine granules	Manual application of granules	Manual	Body			Value for application is for combination of mixing&loading and application	PHED	68,8708	253,4438	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesManual application of granulesManualHands	Outdoor	Granules, fine granules	Manual application of granules	Manual	Hands			Value for application is for combination of mixing&loading and application	PHED	26,5320	94,3636	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED
OutdoorGranules, fine granulesManual application of granulesManualInhalation	Outdoor	Granules, fine granules	Manual application of granules	Manual	Inhalation			Value for application is for combination of mixing&loading and application	PHED	0,4677	1,5251	Exposure value originally included use of PPE, calculated potential exposure is 100 times higher assuming a 'worst case' reduction factor of 1% for gloves/coverall	PHED



