Gz: **4.0-710 05/08.00017**
Produktname: **(BPF)-Primer TIP**

Application number: 001
Application: Brush treatment

MetaSPC 1, 2 and 3

Ingredient Biocidal product	TIER 1		TIER 2	
	potential inhalation	potential dermal [mg/day]	actual inhalation	actual dermal [mg/day]
a.s. no. 1: IPBC	2,53E-02 mg/day	10,43	2,53E-02 mg/day	3,76
a.s. no. 2: Tebuconazole	1,06E-02 mg/day	4,38	1,06E-02 mg/day	1,58
a.s. no. 3: Permethrin	3,03E-03 mg/day	1,25	3,03E-03 mg/day	0,45
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	639 mg/m^3	not assessed	114 mg/m^3	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	1031 mg/m^3	not assessed	157 mg/m^3	not assessed

Application number: 003
Application: Immersion - automated dipping

MetaSPC 1, 2 and 3

Ingredient Biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m^3]	potential dermal [mg/day]	actual inhalation [mg/m^3]	actual dermal [mg/day]
a.s. no. 1: **daily** IPBC	not expected, no aerosol	6,76	not expected, no aerosol	1,68
a.s. no. 1: **weekly** IPBC	not expected, no aerosol	1,68	not expected, no aerosol	1,68
a.s. no. 2: **daily** Tebuconazole	not expected, no aerosol	2,84	not expected, no aerosol	0,71
a.s. no. 2: **weekly** Tebuconazole	not expected, no aerosol	0,71	not expected, no aerosol	0,71
a.s. no. 3: **daily** Permethrin	not expected, no aerosol	0,81	not expected, no aerosol	0,20
a.s. no. 3: **weekly** Permethrin	not expected, no aerosol	0,20	not expected, no aerosol	0,20
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA) **daily**	29	not assessed	29	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA) **weekly**	7	not assessed	7	not assessed

soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL) daily and weekly	138	not assessed	138	not assessed

Application number: **004**
Application: **Dip treatment - manual dipping**

MetaSPC 1, 2 and 3

Ingredient Biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: IPBC (daily)	3,13E-04	46,68	3,13E-04	7,46
a.s. no. 2: Tebuconazole (daily)	1,31E-04	19,60	1,31E-04	3,13
a.s. no. 3: Permethrin (daily)	3,75E-05	5,60	3,75E-05	0,89
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	191	not assessed	191	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	457	not assessed	457	not assessed

Application number: **005**
Application: **Deluge treatment**

MetaSPC 1, 2 and 3

	TIER 1		TIER 2	
Ingredient Biocidal product	potential inhalation	potential dermal	actual inhalation	actual dermal
	[mg/m³]	[mg/day]	[mg/m³]	[mg/day]
a.s. no. 1: IPBC	6,25E-04	49,17	3,13E-04	5,25
a.s. no. 2: Tebuconazole	2,63E-04	20,65	1,31E-04	2,20
a.s. no. 3: Permethrin	7,50E-05	5,90	3,75E-05	0,63
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	76	not assessed	76	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	150	not assessed	150	not assessed

Application number: **006**
Application: **Mechanical processing of treated wood**

MetaSPC 1, 2 and 3

Ingredient Biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: IPBC	2,26E-03	7,42	2,26E-03	0,74
a.s. no. 2: Tebuconazole	9,50E-04	3,12	9,50E-04	0,31
a.s. no. 3: Permethrin	2,71E-04	0,89	2,71E-04	0,09
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	not expected	not assessed	not expected	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	not expected	not assessed	not expected	not assessed

Application number: **001**
Application: **Brush treatment** meta-SPC 1, 2 and 3

Ingredient biocidal product	TIER 1		TIER 2	
	potential inhalation	potential dermal [mg/day]	actual inhalation	actual dermal [mg/day]
a.s. no. 1: IPBC	2,53E-02 mg/day	10,43	2,53E-02 mg/day	3,76
a.s. no. 2: Tebuconazole	1,06E-02 mg/day	4,38	1,06E-02 mg/day	1,58
a.s. no. 3: Permethrin	3,03E-03 mg/day	1,25	3,03E-03 mg/day	0,45
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	639 mg/m³	not assessed	114 mg/m³	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	1031 mg/m³	not assessed	157 mg/m³	not assessed

Details of exposure assessment

			factor	RMM
formulation type	liquid formulation, ready-to-use			
conc. a.s. 1	0,50%	respiratory protection factor	1	no protection
conc. a.s. 2	0,21%	penetration of coverall	100%	no protection
conc. a.s. 3	0,06%	penetration of protective gloves	10%	protective gloves
conc. soc 1*	88,6%	technical/organisational measure	air exchange rate of 5/h considered in ConsExpo (instead of 0.5/h)	Improved ventilation (cross ventilation providing an air exchange rate of 5 /h)
conc. b.p. in application solution	100%			
density of product	0,804 g/cm³			

* Concentration of the soc differs slightly between meta-SPC 1 (88.05%) and meta-SPC 7; for this calculation the higher concentration of meta-SPC 7 was used covering the worst-case.

a.s. no. 1: IPBC

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Mixing & Loading	not applicable	**Mixing & Loading**	not applicable
Application		**Application**	
Concentration a.s.	0,50%	Potential inhalation exposure a.s.	2,53E-02 mg
Indicative value 1)	1,60E-03 mg/m²	RMM: no protection	1
Application area 2)	31,5789 m²	Actual inhalation exposure a.s.	2,53E-02 mg
Potential inhalation exposure per 1% a.s.	5,05E-02 mg		
Potential inhalation exposure a.s.	2,53E-02 mg		
Post-Application	not expected	**Post-Application**	not expected
All phases		**All phases**	
Total potential inhalation exposure a.s.	0,02526 mg	Total actual inhalation exposure a.s.	0,02526 mg

DERMAL EXPOSURE	TIER 1	DERMAL EXPOSURE	TIER 2
Mixing & Loading	not applicable	**Mixing & Loading**	not applicable
Application		**Application**	
Concentration a.s.	0,50%	Potential hand exposure a.s.	8,55 mg a.s.
Indicative value - hand 1)	0,5417 mg/m²	RMM: protective gloves	10%
Indicative value - body 1)	0,2382 mg/m²	Actual hand exposure a.s.	0,86 mg a.s.
Application area 2)	31,5789 m²	Potential body exposure a.s.	3,76 mg a.s.
Potential hand exposure (product)	17,11 mg	RMM: no protection	100%
Potential hand exposure a.s.	8,55 mg a.s.	Actual body exposure a.s.	3,76 mg a.s.
Potential body exposure (product)	7,52 mg		
Potential body exposure a.s.	3,76 mg a.s.		
Total potential dermal exposure a.s.	12,31 mg a.s.	Total actual dermal exposure a.s.	4,62 mg a.s.
Post-Application		**Post-Application**	
Concentration a.s.	0,50%	Potential hand exposure a.s.	0,66 mg a.s.
Residues in brush 3)	25 ml	RMM: protective gloves	10%
Product on skin after 3 washings 3)	131,56 mg b.p.	Actual hand exposure a.s.	0,07 mg a.s.
Potential hand exposure a.s.	0,66 mg a.s.		
Total potential dermal exposure a.s.	0,66 mg a.s.	Total actual dermal exposure a.s.	0,07 mg a.s.
All phases		**All phases**	
Total potential dermal exposure all phases a.s.	12,97 mg a.s.	Total actual dermal exposure all phases a.s.	4,68 mg a.s.
Total potential dermal exposure all phases a.s. - corrected with density	10,43 mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	3,76 mg a.s.

1) Study of BfR: Summary Report - Human Exposure to Wood Preservatives, Lingk, W.; Reifenstein, H.; Westphal, D.; Plattner, E., BfR Wissenschaft, 2006 (indicative values normalized to 1% a.s.)

2) Application area calculated as follows: 1. 240min (expert judgement), 2. 7.6min/m2 (consumer painting model 3, median) 3. calculation: 1/7.6*240 (for 2. see also "Potential Exposure of Amateurs (Consumers) through Painting Wood Preservative and Antifoulant Preparations", Garrod, A. N. I., Guiver, R., Rimmer, D. A., Ann. occup. hyg., 44, 421-426, 2000)

3) Human Exposure Expert Group (HEEG) opinion on Exposure model Primary exposure scenario - washing out of a brush which has been used to apply a paint, 2010

a.s. no. 2: Tebuconazole

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Mixing & Loading	not applicable	**Mixing & Loading**	not applicable

Application			**Application**		
Concentration a.s.	0,21%		Potential inhalation exposure a.s.	1,06E-02	mg
Indicative value 1)	1,60E-03	mg/m²	RMM: no protection	1	
Application area 2)	31,5789	m²	Actual inhalation exposure a.s.	1,06E-02	mg
Potential inhalation exposure per 1% a.s.	5,05E-02	mg			
Potential inhalation exposure a.s.	1,06E-02	mg			
Post-Application	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s.	1,06E-02	mg	Total actual inhalation exposure a.s.	1,06E-02	mg
DERMAL EXPOSURE	**TIER 1**		**DERMAL EXPOSURE**	**TIER 2**	
Mixing & Loading	not applicable		**Mixing & Loading**	not applicable	
Application			**Application**		
Concentration a.s.	0,21%		Potential hand exposure a.s.	3,59	mg a.s.
Indicative value - hand 1)	0,5417	mg/m²	RMM: protective gloves	10%	
Indicative value - body 1)	0,2382	mg/m²	Actual hand exposure a.s.	0,36	mg a.s.
Application area 2)	31,5789	m²	Potential body exposure a.s.	1,58	mg a.s.
Potential hand exposure (product)	17,11	mg	RMM: no protection	100%	
Potential hand exposure a.s.	3,59	mg a.s.	Actual body exposure a.s.	1,58	mg a.s.
Potential body exposure (product)	7,52	mg			
Potential body exposure a.s.	1,58	mg a.s.			
Total potential dermal exposure a.s.	5,17	mg a.s.	Total actual dermal exposure a.s.	1,94	mg a.s.
Post-Application			**Post-Application**		
Concentration a.s.	0,21%		Potential hand exposure a.s.	0,28	mg a.s.
Residues in brush 3)	25	ml	RMM: protective gloves	10%	
Product on skin after 3 washings 3)	131,56	mg b.p.	Actual hand exposure a.s.	0,03	mg a.s.
Potential hand exposure a.s.	0,28	mg a.s.			
Total potential dermal exposure a.s.	0,28	mg a.s.	Total actual dermal exposure a.s.	0,03	mg a.s.
All phases			**All phases**		
Total potential dermal exposure all phases a.s.	5,45	mg a.s.	Total actual dermal exposure all phases a.s.	1,97	mg a.s.
Total potential dermal exposure all phases a.s. - corrected with density	4,38	mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	1,58	mg a.s.

1) Study of BfR: Summary Report - Human Exposure to Wood Preservatives, Lingk, W.; Reifenstein, H.; Westphal, D.; Plattner, E., BfR Wissenschaft, 2006 (indicative values normalized to 1% a.s.)

2) Application area calculated as follows: 1. 240min (expert judgement), 2. 7.6min/m2 (consumer painting model 3, median) 3. calculation: 1/7.6*240 (for 2. see also "Potential Exposure of Amateurs (Consumers) through Painting Wood Preservative and Antifoulant Preparations", Garrod, A. N. I., Guiver, R., Rimmer, D. A., Ann. occup. hyg., 44, 421-426, 2000)

3) Human Exposure Expert Group (HEEG) opinion on Exposure model Primary exposure scenario - washing out of a brush which has been used to apply a paint, 2010

a.s. no. 3: Permethrin

INHALATION EXPOSURE	**TIER 1**		**INHALATION EXPOSURE**	**TIER 2**	
Mixing & Loading	not applicable		**Mixing & Loading**	not applicable	
Application			**Application**		
Concentration a.s.	0,06%		Potential inhalation exposure a.s.	3,03E-03	mg
Indicative value 1)	1,60E-03	mg/m²	RMM: no protection	1	
Application area 2)	31,5789	m²	Actual inhalation exposure a.s.	3,03E-03	mg
Potential inhalation exposure per 1% a.s.	5,05E-02	mg			
Potential inhalation exposure a.s.	3,03E-03	mg			
Post-Application	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s.	0,00303	mg	Total actual inhalation exposure a.s.	3,03E-03	mg
DERMAL EXPOSURE	**TIER 1**		**DERMAL EXPOSURE**	**TIER 2**	
Mixing & Loading	not applicable		**Mixing & Loading**	not applicable	
Application			**Application**		
Concentration a.s.	0,06%		Potential hand exposure a.s.	1,03	mg a.s.
Indicative value - hand 1)	0,5417	mg/m²	RMM: protective gloves	10%	
Indicative value - body 1)	0,2382	mg/m²	Actual hand exposure a.s.	0,10	mg a.s.
Application area 2)	31,5789	m²	Potential body exposure a.s.	0,45	mg a.s.
Potential hand exposure (product)	17,11	mg	RMM: no protection	100%	
Potential hand exposure a.s.	1,03	mg a.s.	Actual body exposure a.s.	0,45	mg a.s.
Potential body exposure (product)	7,52	mg			
Potential body exposure a.s.	0,45	mg a.s.			
Total potential dermal exposure a.s.	1,48	mg a.s.	Total actual dermal exposure a.s.	0,55	mg a.s.
Post-Application			**Post-Application**		
Concentration a.s.	0,06%		Potential hand exposure a.s.	0,08	mg a.s.
Residues in brush 3)	25	ml	RMM: protective gloves	10%	
Product on skin after 3 washings 3)	131,56	mg b.p.	Actual hand exposure a.s.	0,01	mg a.s.
Potential hand exposure a.s.	0,08	mg a.s.			
Total potential dermal exposure a.s.	0,08	mg a.s.	Total actual dermal exposure a.s.	0,01	mg a.s.
All phases			**All phases**		

Total potential dermal exposure all phases a.s.	1,56 mg a.s.	Total actual dermal exposure all phases a.s.	0,56 mg a.s.
Total potential dermal exposure all phases a.s. - corrected with density	1,25 mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	0,45 mg a.s.

1) Study of BfR: Summary Report - Human Exposure to Wood Preservatives, Lingk, W.; Reifenstein, H.; Westphal, D.; Plattner, E., BfR Wissenschaft, 2006 (indicative values normalized to 1% a.s.)

2) Application area calculated as follows: 1. 240min (expert judgement), 2. 7.6min/m2 (consumer painting model 3, median) 3. calculation: 1/7.6*240 (for 2. see also "Potential Exposure of Amateurs (Consumers) through Painting Wood Preservative and Antifoulant Preparations", Garrod, A. N. I., Guiver, R., Rimmer, D. A., Ann. occup. hyg., 44, 421-426, 2000)

3) Human Exposure Expert Group (HEEG) opinion on Exposure model Primary exposure scenario - washing out of a brush which has been used to apply a paint, 2010

soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

INHALATION EXPOSURE	**TIER 1**	**INHALATION EXPOSURE**	**TIER 2**
Mixing & Loading Application (daily)	not expected, no aerosol	**Mixing & Loading Application (daily)**	not expected, no aerosol
Exposure to aerosols	negligible compared to exposure to vapours	Exposure to aerosols	negligible compared to exposure to vapours
Exposure to vapour	**ConsExpo**	Exposure to vapour	**ConsExpo**
Exposure level for vapour 1)	639 mg/m³	Refined exposure level for vapour 4)	114 mg/m³
Duration 2)	480 min	Refined duration 5)	480 min
Potential inhalation exposure soc (8h TWA)	639 mg/m³	Refined inhalation exposure soc, without RPE (TWA)	114 mg/m³
Potential inhalation exposure soc (STEL)	1031 mg/m³	Refined inhalation exposure soc, without RPE (STEL)	157 mg/m³
		RMM: no protection	1
		Actual inhalation exposure soc (TWA)	114 mg/m³
		Actual inhalation exposure soc (STEL)	157 mg/m³
All phases		**All phases**	
Total potential inhalation exposure soc (8h TWA)	639 mg/m³	Total actual inhalation exposure soc (8h TWA)	114 mg/m³
Total potential inhalation exposure soc (STEL)	1031 mg/m³	Total potential inhalation exposure soc (STEL)	157 mg/m³

1) Calculated with ConsExpo 4.1

2) expert judgement. It is assumed that application takes 240 min, however, the worker is assumed to continue working in the room for another 240 min, giving a total of 480 min for the ConsExpo assessment.

ConsExpo calculation for soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Tier 1

Product

Product name	Primer/ TIP

Compound

	Hydrocarbons, C10-C13	
Compound name :		
CAS number :		
molecular weight	160	g/mol
vapour pressure	50	Pascal
Inhalation model: Exposure to vapour : evaporation		increasing area
weight fraction compound	88,6	%
exposure duration	480	minute
room volume	150	m3
ventilation rate	0,5	1/hr
applied amount	5,7	kilogram
release area	31,6	m2
application duration	240	minute
mol weight matrix	160	g/mol
mass transfer rate	0,0231	m/min

Output

Inhalation (point estimates)

inhalation mean event concentration	639	mg/m³
Short term exposure level	1031	mg/m³

Tier 2

Product

Product name	Primer TIP

Compound

	Hydrocarbons, C10-C13	
Compound name :		
CAS number :		
molecular weight	160	g/mol
vapour pressure	50	Pascal
Inhalation model: Exposure to vapour : evaporation		increasing area
weight fraction compound	88,6	%
exposure duration	480	minute
room volume	150	m3
ventilation rate	5	1/hr
applied amount	5,7	kilogram
release area	31,6	m2
application duration	240	minute
mol weight matrix	160	g/mol
mass transfer rate	0,0231	m/min

Output

Inhalation (point estimates)

inhalation mean event concentration	114	mg/m³
Short term exposure level	157	mg/m3

Application number: 003
Application: **Immersion - automated dipping** meta-SPC 1, 2 and 3

Ingredient biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal * [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: daily	not expected, no aerosol	6,76	not expected, no aerosol	1,68
a.s. no. 1: weekly	not expected, no aerosol	1,68	not expected, no aerosol	1,68
a.s. no. 2: daily	not expected, no aerosol	2,84	not expected, no aerosol	0,71
a.s. no. 2: weekly	not expected, no aerosol	0,71	not expected, no aerosol	0,71
a.s. no. 3: daily	not expected, no aerosol	0,81	not expected, no aerosol	0,20
a.s. no. 3: weekly	not expected, no aerosol	0,20	not expected, no aerosol	0,20
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA) daily	29	not assessed	29	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA) weekly	7	not assessed	7	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL) daily and weekly	138	not assessed	138	not assessed

* including actual hand exposure

Details of exposure assessment

			factor	RMM
formulation type	liquid formulation	technical protection factor	4	fully automated immersion system
conc. a.s. 1	0,50%	respiratory protection factor	1	no protection
conc. a.s. 2	0,21%	penetration of coverall	100%	no protection
conc. a.s. 3	0,06%	penetration of protective gloves	10%	protective gloves
conc. soc 1*	88,60%	additional RPE	1	no protection
conc. b.p. in application solution	100%			
density of product	0,804 g/cm³			

* Concentration of the soc differs slightly between meta-SPC 1 (88.05%) and meta-SPC 7; for this calculation the higher concentration of meta-SPC 7 was used covering the worst-case.

a.s. no. 1: IPBC

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Mixing & Loading, Application, Post-application	not expected, no aerosol	**Mixing & Loading, Application, Post-application**	not expected, no aerosol
DERMAL EXPOSURE	**TIER 1**	**DERMAL EXPOSURE**	**TIER 2**
Mixing & Loading		**Mixing & Loading**	
Concentration a.s.	0,50%	Potential hand exposure a.s.	4,60E-02 mg a.s.
Duration 1)	10 min	RMM: protective gloves	10%
Indicative value (75th percentile) 2)	0,92 mg/min	Actual hand exposure a.s.	4,60E-03 mg a.s.
Potential hand exposure (product)	9,20 mg		
Total potential hand exposure a.s.	4,60E-02 mg a.s.	Total actual dermal exposure a.s.	4,60E-03 mg a.s.
Application		**Application**	
Concentration a.s.	0,50%	Actual hand exposure a.s. (Tier 1)	5,20 mg a.s.
Number of dipping cycles 3a)	4	Potential body exposure a.s. (Tier 1)	3,16 mg a.s.
Actual hand exposure (product) 4)	260 mg / dipping cycle	technical protection factor 3b)	4
Product on clothing (product) 4)	158 mg / dipping cycle	Actual hand exposure a.s. (incl. technical protection factor)	1,30 mg a.s.
Actual hand exposure a.s. (Tier 1)	5,20 mg a.s.	Potential body exposure a.s. (incl. technical protection factor)	0,79 mg a.s.
Potential body exposure a.s. (Tier 1)	3,16 mg a.s.	RMM: no protection	100%
		Actual body exposure a.s. (incl. technical protection factor)	0,79 mg a.s.
Total dermal exposure a.s.	8,36 mg a.s.	Total actual dermal exposure a.s.	2,09 mg a.s.
Post-Application		**Post-Application**	
Concentration a.s.	0,50%	Actual hand exposure a.s.	1,30 mg a.s.
Frequency 6)	weekly	Potential body exposure a.s.	0,79 mg a.s.
Number of dipping cycles 5)	1	RMM: no protection	100%
Actual hand exposure (product) 4)	260 mg / cycle	Actual body exposure a.s.	0,79 mg a.s.
Product on clothing (product) 4)	158 mg / cycle		
Actual hand exposure a.s.	1,30 mg a.s.		
Potential body exposure a.s.	0,79 mg a.s.		
Total dermal exposure a.s.	2,09 mg a.s.	Total actual dermal exposure a.s.	2,09 mg a.s.
All phases		**All phases**	
Longterm exposure (total daily dermal exposure) a.s.	8,41 mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s.	2,09 mg a.s.
Shortterm exposure (weekly dermal exposure) a.s.	2,09 mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s.	2,09 mg a.s.

Longterm exposure (total daily dermal exposure) a.s. - corrected with density	6,76	mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s. - corrected with density	1,68	mg a.s.
Shortterm exposure (weekly dermal exposure) a.s. - corrected with density	1,68	mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s. - corrected with density	1,68	mg a.s.

1) expert judgement

2) Human Exposure Export Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

3a) Human Exposure Export Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

3b) Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013; exposure relevant cycles depend on technical equipment

4) Handling Model 1 (WB liquid formulation), TNsG Human Exposure User Guidance 2002

5) TNsG Human Exposure part 3, example, chapter 7.1 Wood Preservatives

6) expert judgement

a.s. no. 2: Tebuconazole

INHALATION EXPOSURE		**TIER 1**		**INHALATION EXPOSURE**	**TIER 2**	
Mixing & Loading, Application, Post-application		not expected, no aerosol		**Mixing & Loading, Application, Post-application**	not expected, no aerosol	
DERMAL EXPOSURE		**TIER 1**		**DERMAL EXPOSURE**	**TIER 2**	
Mixing & Loading				**Mixing & Loading**		
Concentration a.s.		0,21%		Potential hand exposure a.s.	1,93E-02	mg a.s.
Duration 1)		10	min	RMM: protective gloves	10%	
Indicative value (75th percentile) 2)		0,92	mg/min	Actual hand exposure a.s.	1,93E-03	mg a.s.
Potential hand exposure (product)		9,20	mg			
Total potential hand exposure a.s.		1,93E-02	mg a.s.	Total actual dermal exposure a.s.	1,93E-03	mg a.s.
Application				**Application**		
Concentration a.s.		0,21%		Actual hand exposure a.s. (Tier 1)	2,18	mg a.s.
Number of dipping cycles 3a)		4		Potential body exposure a.s. (Tier 1)	1,33	mg a.s.
Actual hand exposure (product) 4)		260	mg / dipping cycle	technical protection factor 3b)	4	
Product on clothing (product) 4)		158	mg / dipping cycle	Actual hand exposure a.s. (incl. technical protection factor)	0,55	mg a.s.
Actual hand exposure a.s. (Tier 1)		2,18	mg a.s.	Potential body exposure a.s. (incl. technical protection factor)	0,33	mg a.s.
Potential body exposure a.s. (Tier 1)		1,33	mg a.s.	RMM: no protection	100%	
				Actual body exposure a.s. (incl. technical protection factor)	0,33	mg a.s.
Total dermal exposure a.s.		3,51	mg a.s.	Total actual dermal exposure a.s.	0,88	mg a.s.
Post-Application				**Post-Application**		
Concentration a.s.		0,21%		Actual hand exposure a.s.	0,55	mg a.s.
Frequency 6)		weekly		Potential body exposure a.s.	0,33	mg a.s.
Number of dipping cycles 5)		1		RMM: no protection	100%	
Actual hand exposure (product) 4)		260	mg / cycle	Actual body exposure a.s.	0,33	mg a.s.
Product on clothing (product) 4)		158	mg / cycle			
Actual hand exposure a.s.		0,55	mg a.s.			
Potential body exposure a.s.		0,33	mg a.s.			
Total dermal exposure a.s.		0,88	mg a.s.	Total actual dermal exposure a.s.	0,88	mg a.s.
All phases				**All phases**		
Longterm exposure (total daily dermal exposure) a.s.		3,53	mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s.	0,88	mg a.s.
Shortterm exposure (weekly dermal exposure) a.s.		0,88	mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s.	0,88	mg a.s.
Longterm exposure (total daily dermal exposure) a.s. - corrected with density		2,84	mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s. - corrected with density	0,71	mg a.s.
Shortterm exposure (weekly dermal exposure) a.s. - corrected with density		0,71	mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s. - corrected with density	0,71	mg a.s.

1) expert judgement

2) Human Exposure Export Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

3a) Human Exposure Export Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

3b) Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013; exposure relevant cycles depend on technical equipment

4) Handling Model 1 (WB liquid formulation), TNsG Human Exposure User Guidance 2002

5) TNsG Human Exposure part 3, example, chapter 7.1 Wood Preservatives

6) expert judgement

a.s. no. 3: Permethrin

INHALATION EXPOSURE		**TIER 1**		**INHALATION EXPOSURE**	**TIER 2**	
Mixing & Loading, Application, Post-application		not expected, no aerosol		**Mixing & Loading, Application, Post-application**	not expected, no aerosol	
DERMAL EXPOSURE		**TIER 1**		**DERMAL EXPOSURE**	**TIER 2**	
Mixing & Loading				**Mixing & Loading**		
Concentration a.s.		0,06%		Potential hand exposure a.s.	5,52E-03	mg a.s.
Duration 1)		10	min	RMM: protective gloves	10%	
Indicative value (75th percentile) 2)		0,92	mg/min	Actual hand exposure a.s.	5,52E-04	mg a.s.
Potential hand exposure (product)		9,20	mg			
Total potential hand exposure a.s.		5,52E-03	mg a.s.	Total actual dermal exposure a.s.	5,52E-04	mg a.s.
Application				**Application**		

Concentration a.s.	0,06%	Actual hand exposure a.s. (Tier 1)	0,62 mg a.s.
Number of dipping cycles 3a)	4	Potential body exposure a.s. (Tier 1)	0,38 mg a.s.
Actual hand exposure (product) 4)	260 mg / dipping cycle	technical protection factor 3b)	4
Product on clothing (product) 4)	158 mg / dipping cycle	Actual hand exposure a.s. (incl. technical protection factor)	0,16 mg a.s.
Actual hand exposure a.s. (Tier 1)	0,62 mg a.s.	Potential body exposure a.s. (incl. technical protection factor)	0,09 mg a.s.
Potential body exposure a.s. (Tier 1)	0,38 mg a.s.	RMM: no protection	100%
		Actual body exposure a.s. (incl. technical protection factor)	0,09 mg a.s.
Total dermal exposure a.s.	1,00 mg a.s.	Total actual dermal exposure a.s.	0,25 mg a.s.
Post-Application		**Post-Application**	
Concentration a.s.	0,06%	Actual hand exposure a.s.	0,16 mg a.s.
Frequency 6)	weekly	Potential body exposure	0,09 mg a.s.
Number of dipping cycles 5)	1	a.s. RMM: no protection	100%
Actual hand exposure (product) 4)	260 mg / cycle	Actual body exposure a.s.	0,09 mg a.s.
Product on clothing (product) 4)	158 mg / cycle		
Actual hand exposure a.s.	0,16 mg a.s.		
Potential body exposure a.s.	0,09 mg a.s.		
Total dermal exposure a.s.	0,25 mg a.s.	Total actual dermal exposure a.s.	0,25 mg a.s.
All phases		**All phases**	
Longterm exposure (total daily dermal exposure) a.s.	1,01 mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s.	0,25 mg a.s.
Shortterm exposure (weekly dermal exposure) a.s.	0,25 mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s.	0,25 mg a.s.
Longterm exposure (total daily dermal exposure) a.s. - corrected with density	0,81 mg a.s.	Longterm exposure (total daily actual dermal exposure) a.s. - corrected with density	0,20 mg a.s.
Shortterm exposure (weekly dermal exposure) a.s. - corrected with density	0,20 mg a.s.	Shortterm exposure (weekly actual dermal exposure) a.s. - corrected with density	0,20 mg a.s.

1) expert judgement

2) Human Exposure Export Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

3a) Human Exposure Export Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

3b) Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013; exposure relevant cycles depend on technical equipment

4) Handling Model 1 (WB liquid formulation), TNsG Human Exposure User Guidance 2002

5) TNsG Human Exposure part 3, example, chapter 7.1 Wood Preservatives

6) expert judgement

soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Mixing & Loading	not applicable	**Mixing & Loading**	not applicable
Application		**Application**	
Exposure to aerosols	negligible compared to exposure to vapours	Exposure to aerosols	negligible compared to exposure to vapours
Exposure to vapours	**ConsExpo**	Exposure to vapours	**ConsExpo**
Exposure level for vapour 1)	115 mg/m³	Exposure level for vapour 1)	115 mg/m³
Duration 2)	30 min	Duration	30 min
Number of Dipping Cycles (daily) 3)	4		
Number of Dipping Cycles (weekly) 4)	1		
Potential inhalation exposure soc (8h TWA, daily)	29 mg/m³	Potential inhalation exposure soc, without RPE (8h TWA, daily)	29 mg/m³
Potential inhalation exposure soc (8h TWA, weekly)	7 mg/m³	Potential inhalation exposure soc, without RPE (8h TWA, weekly)	7 mg/m³
Potential inhalation exposure soc (15 min STEL, daily and weekly) 5)	138 mg/m³	Potenial inhalation exposure soc, without RPE (STEL, daily and weekly)	138 mg/m³
		RMM: no protection, protection factor:	1
		Actual inhalation exposure soc (8h TWA, daily)	29 mg/m³
		Actual inhalation exposure soc (8h TWA, weekly)	7 mg/m³
		Actual inhalation exposure soc (STEL, daily and weekly)	138 mg/m³
All phases		**All phases**	
Total potential inhalation exposure soc (8h TWA, daily)	29 mg/m³	Total actual inhalation exposure soc (8h TWA, daily)	29 mg/m³
Total potential inhalation exposure soc (8h TWA, weekly)	7 mg/m³	Total actual inhalation exposure soc (8h TWA, weekly)	7 mg/m³
Total potential inhalation exposure soc (15 min STEL, daily and weekly)	138 mg/m³	Total actual inhalation exposure soc (STEL)	138 mg/m³

1) Calculated with ConsExpo 4.1

2) expert judgement.

3) Human Exposure Export Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

4) TNsG Human Exposure part 3, example, chapter 7.1 Wood Preservatives

5) Extracted from ConsExpo 4.1 results taking the average of the 15 min interval with the highest exposure

ConsExpo calculation for soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Product

Product name Primer TIP

Compound

	Hydrocarbons, C10-C13	
Compound name :		
CAS number :		
molecular weight	160	g/mol
vapour pressure	50	Pascal

Inhalation model: Exposure to vapour : evaporation increasing area

weight fraction compound	88,6	%
exposure duration	30	minute
room volume	1500	m3
ventilation rate	10	1/hr
applied amount	181	kilogram
release area	1000	m2
application duration	30	minute
mol weight matrix	160	g/mol
mass transfer rate	0,013	m/min

Output

Inhalation (point estimates)

inhalation mean event concentration :	115	mg/m³
Short term exposure level	138	mg/m³

Application number: **004**
Application: **Dip treatment - manual dipping** meta-SPC 1, 2 and 3

Ingredient biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal * [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: IPBC (daily)	3,13E-04	46,68	3,13E-04	7,46
a.s. no. 2: Tebuconazole (daily)	1,31E-04	19,60	1,31E-04	3,13
a.s. no. 3: Permethrin (daily)	3,75E-05	5,60	3,75E-05	0,89
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	191	not assessed	191	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	457	not assessed	457	not assessed

* including actual hand exposure

Details of exposure assessment

			factor	RMM
formulation type	liquid formulation	respiratory protection factor	1	no protection
conc. a.s. 1	0,50%	penetration of coverall	10%	coverall (type 6)
conc. a.s. 2	0,21%	penetration of protective gloves	10%	protective gloves
conc. a.s. 3	0,06%	additional RPE	1	no protection
conc. soc 1*	88,60%			
conc. b.p. in application solution	100%			
density of product	0,804 g/cm³			

* Concentration of the soc differs slightly between meta-SPC 1 (88.05%) and meta-SPC 7; for this calculation the higher concentration of meta-SPC 7 was used covering the worst-case.

a.s. no. 1: IPBC

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Mixing & Loading	not expected, no aerosol	**Mixing & Loading**	not expected, no aerosol
Application		**Application**	
Concentration a.s.	0,50%	Potential inhalation exposure a.s.	5,00E-03 mg/m³
Number of dipping cycles/day 1)	1	Protection factor	1
Duration 1)	30 min	Actual inhalation exposure 1 a.s.	5,00E-03 mg/m³
Indicative value (75th percentile) 2)	1 mg/m³	Additional protection factor	1
Potential inhalation exposure a.s.	5,00E-03 mg/m³	Actual inhalation exposure 2 a.s.	5,00E-03 mg/m³
8 h TWA	3,13E-04 mg/m³	8 h TWA	3,13E-04 mg/m³
Post-Application (monthly)	not expected	**Post-Application**	not expected
All phases		**All phases**	
Total potential inhalation exposure a.s. (8h TWA)	3,13E-04 mg/m³	Total potential inhalation exposure a.s. (8h TWA)	3,13E-04 mg/m³

DERMAL EXPOSURE	TIER 1	DERMAL EXPOSURE	TIER 2
Mixing & Loading		**Mixing & Loading**	
Concentration a.s.	0,50%	Potential hand exposure a.s.	2,50E+00 mg a.s.
Number of Loadings (up to 20l)	1	RMM: protective gloves	10%
Indicative value (75th percentile, manual loading) 3)	0,5 ml b.p./loading	Actual hand exposure a.s.	2,50E-01 mg a.s.
Potential hand exposure (product)	500 mg b.p.		
Total potential hand exposure a.s.	2,5 mg a.s.	Total actual dermal exposure a.s.	2,50E-01 mg a.s.
Application		**Application**	
Concentration a.s.	0,50%	Actual hand exposure a.s.	3,86 mg a.s.
Number of cycles/day 1)	1	Potential body exposure a.s.	26,7 mg a.s.
Duration 1)	30 min	RMM: coverall (type 6)	10%
Actual hand exposure (product) 2)	25,7 mg/min	Actual body exposure a.s.	2,67 mg a.s.
Product on clothing (product) 2)	178 mg/min		
Actual hand exposure a.s.	3,86 mg a.s.		
Potential body exposure a.s.	26,7 mg a.s.		
Total dermal exposure a.s.	30,56 mg a.s.	Total actual dermal exposure a.s.	6,53 mg a.s.
Post-Application (monthly)		**Post-Application (monthly)**	
Concentration a.s.	0,50%	Potential hand exposure a.s.	25,00 mg a.s.
Number of Loadings (up to 20l)	10		
Indicative value (75th percentile, manual loading) 3)	0,5 ml b.p./loading	RMM: protective gloves	10%
Potential hand exposure (product)	5000 mg b.p.		
Potential hand exposure a.s.	25 mg a.s.	Actual hand exposure	2,50 mg a.s.
M&L and application phases (daily incl. monthly maintenance)[4)]		**M&L and application phases (daily incl. monthly maintenance)**	
Total dermal exposure all phases a.s.	58,06 mg a.s.	Total actual dermal exposure all phases a.s.	9,28 mg a.s.
Total dermal exposure all phases a.s. - corrected with density	46,68 mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	7,46 mg a.s.

1) Human Exposure Expert Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) It is assumed that regular daily M&L and application may be done by the same worker on the same day as the post application (maintenance by draining und refilling the dipping bath). Thus, these exposures have been comined as a worst-case.

a.s. no. 2: Tebuconazole

INHALATION EXPOSURE	TIER 1		INHALATION EXPOSURE	TIER 2	
Mixing & Loading	not expected, no aerosol		**Mixing & Loading**	not expected, no aerosol	
Application			**Application**		
Concentration a.s.	0,21%		Potential inhalation exposure a.s.	2,10E-03	mg/m³
Number of dipping cycles/day 1)	1		Protection factor	1	
Duration 1)	30	min	Actual inhalation exposure 1 a.s.	2,10E-03	mg/m³
Indicative value (75th percentile) 2)	1	mg/m³	Additional protection factor	1	
Potential inhalation exposure a.s.	2,10E-03	mg/m³	Actual inhalation exposure 2 a.s.	2,10E-03	mg/m³
8 h TWA	1,31E-04	mg/m³	8 h TWA	1,31E-04	mg/m³
Post-Application (monthly)	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s. (8h TWA)	1,31E-04	mg/m³	Total potential inhalation exposure a.s. (8h TWA)	1,31E-04	mg/m³

DERMAL EXPOSURE	TIER 1		DERMAL EXPOSURE	TIER 2	
Mixing & Loading			**Mixing & Loading**		
Concentration a.s.	0,21%		Potential hand exposure a.s.	1,05E+00	mg a.s.
Number of Loadings (up to 20l)	1		RMM: protective gloves	10%	
Indicative value (75th percentile, manual loading) 3)	0,5	ml b.p./loading	Actual hand exposure a.s.	1,05E-01	mg a.s.
Potential hand exposure (product)	500	mg b.p.			
Total potential hand exposure a.s.	1,05	mg a.s.	Total actual dermal exposure a.s.	1,05E-01	mg a.s.
Application			**Application**		
Concentration a.s.	0,21%		Actual hand exposure a.s.	1,62	mg a.s.
Number of cycles/day 1)	1		Potential body exposure a.s.	11,214	mg a.s.
Duration 1)	30	min	RMM: coverall (type 6)	10%	
Actual hand exposure (product) 2)	25,7	mg/min	Actual body exposure a.s.	1,12	mg a.s.
Product on clothing (product) 2)	178	mg/min			
Actual hand exposure a.s.	1,62	mg a.s.			
Potential body exposure a.s.	11,214	mg a.s.			
Total dermal exposure a.s.	12,83	mg a.s.	Total actual dermal exposure a.s.	2,74	mg a.s.
Post-Application (monthly)			**Post-Application (monthly)**		
Concentration a.s.	0,21%		Potential hand exposure a.s.	10,50	mg a.s.
Number of Loadings (up to 20l)	10				
Indicative value (75th percentile, manual loading) 3)	0,5	ml b.p./loading	RMM: protective gloves	10%	
Potential hand exposure (product)	5000	mg b.p.			
Potential hand exposure a.s.	10,5	mg a.s.	Actual hand exposure	1,05	mg a.s.
M&L and application phases (daily incl. monthly maintenance)[4)]			**M&L and application phases (daily incl. monthly maintenance)**		
Total dermal exposure all phases a.s.	24,38	mg a.s.	Total actual dermal exposure all	3,90	mg a.s.
Total dermal exposure all phases a.s. - corrected with	19,60	mg a.s.	Total actual dermal exposure all	3,13	mg a.s.

1) Human Exposure Expert Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) It is assumed that regular daily M&L and application may be done by the same worker on the same day as the post application (maintenance by draining und refilling the dipping bath). Thus, these exposures have been comined as a worst-case.

a.s. no. 3: Permethrin

INHALATION EXPOSURE	TIER 1		INHALATION EXPOSURE	TIER 2	
Mixing & Loading	not expected, no aerosol		**Mixing & Loading**	not expected, no aerosol	
Application			**Application**		
Concentration a.s.	0,06%		Potential inhalation exposure a.s.	6,00E-04	mg/m³
Number of dipping cycles/day 1)	1		Protection factor	1	
Duration 1)	30	min	Actual inhalation exposure 1 a.s.	6,00E-04	mg/m³
Indicative value (75th percentile) 2)	1	mg/m³	Additional protection factor	1	
Potential inhalation exposure a.s.	6,00E-04	mg/m³	Actual inhalation exposure 2 a.s.	6,00E-04	mg/m³
8 h TWA	3,75E-05	mg/m³	8 h TWA	3,75E-05	mg/m³
Post-Application (monthly)	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s. (8h TWA)	3,75E-05	mg/m³	Total potential inhalation exposure	3,75E-05	mg/m³

DERMAL EXPOSURE	TIER 1		DERMAL EXPOSURE	TIER 2	
Mixing & Loading			**Mixing & Loading**		
Concentration a.s.	0,06%		Potential hand exposure a.s.	3,00E-01	mg a.s.
Number of Loadings (up to 20l)	1		RMM: protective gloves	10%	
Indicative value (75th percentile, manual loading) 3)	0,5	ml b.p./loading	Actual hand exposure a.s.	3,00E-02	mg a.s.
Potential hand exposure (product)	500	mg b.p.			
Total potential hand exposure a.s.	0,3	mg a.s.	Total actual dermal exposure a.s.	3,00E-02	mg a.s.
Application			**Application**		
Concentration a.s.	0,06%		Actual hand exposure a.s.	0,46	mg a.s.
Number of cycles/day 1)	1		Potential body exposure a.s.	3,204	mg a.s.
Duration 1)	30	min	RMM: coverall (type 6)	10%	
Actual hand exposure (product) 2)	25,7	mg/min	Actual body exposure a.s.	0,32	mg a.s.
Product on clothing (product) 2)	178	mg/min			
Actual hand exposure a.s.	0,46	mg a.s.			
Potential body exposure a.s.	3,204	mg a.s.			
Total dermal exposure a.s.	3,67	mg a.s.	Total actual dermal exposure a.s.	0,78	mg a.s.

Post-Application (monthly)		**Post-Application (monthly)**	
Concentration a.s.	0,06%	Potential hand exposure	3,00 mg a.s.
Number of Loadings (up to 20l)	10	a.s. RMM: protective gloves	10%
Indicative value (75th percentile, manual loading) 3)	0,5 ml b.p./loading	Actual hand exposure	0,30 mg a.s.
Potential hand exposure (product)	5000 mg b.p.		
Potential hand exposure a.s.	3,00 mg a.s.		
M&L and application phases (daily incl. monthly maintenance)		**M&L and application phases (daily incl. monthly maintenance)**	
Total dermal exposure all phases a.s.	6,97 mg a.s.	Total actual dermal exposure all phases a.s.	1,11 mg a.s.
Total dermal exposure all phases a.s. - corrected with density	5,60 mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	0,89 mg a.s.

1) Human Exposure Expert Group (HEEG) opinion "Defaults and appropriate models to assess human exposure for dipping processes PT8", 2009

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) It is assumed that regular daily M&L and application may be done by the same worker on the same day as the post application (maintenance by draining und refilling the dipping bath). Thus, these exposures have been comined as a worst-case.

soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

INHALATION EXPOSURE	**TIER 1**	**INHALATION EXPOSURE**	**TIER 2**
Mixing & Loading	not expected, no aerosol	**Mixing & Loading**	not expected, no aerosol
Application		**Application**	
Exposure to aerosols	negligible compared to exposure to	Exposure to aerosols	negligible compared to exposure to vapours
Exposure to vapour	**ConsExpo**	Exposure to vapour	**ConsExpo**
Exposure level for vapour 1)	381 mg/m³	Exposure level for vapour	381 mg/m³
Duration	240 min	Refined duration	240 min
Potential inhalation exposure soc (8h TWA)	191 mg/m³	Refined inhalation exposure soc, without RPE (8h TWA)	191 mg/m³
Potential inhalation exposure soc (STEL) 2)	457 mg/m³	Refined inhalation exposure soc, without RPE (STEL)	457 mg/m³
		RMM: no protection	1
		Actual inhalation exposure soc (8h TWA)	191 mg/m³
		Actual inhalation exposure soc (STEL)	457 mg/m³
All phases		**All phases**	
Total potential inhalation exposure soc (8h TWA)	191 mg/m³	Total actual inhalation exposure soc (8h TWA)	191 mg/m³
Total potential inhalation exposure soc (STEL)	457 mg/m³	Total actual inhalation exposure soc (STEL)	457 mg/m³

1) Calculated with ConsExpo 4.1

2) Extracted from ConsExpo 4.1 results taking the average of the 15 min interval with the highest exposure

ConsExpo calculation for soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Tier 1

Product

Product name: Primer TIP

Compound

Compound name :	Hydrocarbons, C10-C13	
CAS number :		
molecular weight	160	g/mol
vapour pressure	50	Pascal

Inhalation model: Exposure to vapour : evaporation — increasing area

weight fraction compound	88,6	%
exposure duration	240	minute
room volume	300	m3
ventilation rate	2	1/hr
applied amount	18,1	kilogram
release area	100	m2
application duration		
	30	minute
mol weight matrix	160	g/mol
mass transfer rate	0,0191	m/min

Output

Inhalation (point estimates)

inhalation mean event concentration :	381	mg/m³
Short term exposure level	457	mg/m3

Application number: **005**
Application: **Deluge treatment** meta-SPC 1, 2 and 3

Ingredient biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal * [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: IPBC	6,25E-04	49,17	3,13E-04	5,25
a.s. no. 2: Tebuconazole	2,63E-04	20,65	1,31E-04	2,20
a.s. no. 3: Permethrin	7,50E-05	5,90	3,75E-05	0,63
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	76	not assessed	76	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	150	not assessed	150	not assessed

* including actual hand exposure

Details of exposure assessment

			factor	RMM
formulation type	liquid formulation	technical protection factor	2	automatic piling system
conc. a.s. 1	0,50%	respiratory protection factor	1	no protection
conc. a.s. 2	0,21%	penetration of coverall	10%	coverall (type 6)
conc. a.s. 3	0,06%	penetration of protective gloves	10%	protective gloves
conc. soc 1*	88,60%	additional RPE	1	no protection
conc. b.p. in application solution	100%			
density of product	0,804 g/cm³			

* Concentration of the soc differs slightly between meta-SPC 1 (88.05%) and meta-SPC 7; for this calculation the higher concentration of meta-SPC 7 was used covering the worst-case.

a.s. no. 1: IPBC

INHALATION EXPOSURE	TIER 1		INHALATION EXPOSURE	TIER 2	
Mixing & Loading	not expected, no aerosol		**Mixing & Loading**	not expected, no aerosol	
Application			**Application**		
Concentration a.s.	0,50%		Potential inhalation exposure a.s.	5,00E-03	mg/m³
Number of cycles/day 1)	2		Technical protection factor: automatic piling system	2	
Duration 1)	30	min	RPE: no protection, protection factor:	1	
Indicative value (75th percentile) 2)	1	mg/m³	Actual inhalation exposure 1 a.s. (considering only RPE)	5,00E-03	mg/m³
Potential inhalation exposure a.s.	5,00E-03	mg/m³			
			Additional protection factor	1	
			Actual inhalation exposure 2 a.s.	5,00E-03	mg/m³
8 h TWA	6,25E-04	mg/m³	8 h TWA	3,13E-04	mg/m³
Post-Application	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s. (8h TWA)	6,25E-04	mg/m³	Total potential inhalation exposure a.s. (8h TWA)	3,13E-04	mg/m³

DERMAL EXPOSURE	TIER 1		DERMAL EXPOSURE	TIER 2	
Mixing & Loading			**Mixing & Loading**		
Concentration a.s.	0,50%		Potential hand exposure a.s.	4,60E-02	mg a.s.
Duration 1)	10	min	RMM: protective gloves	10%	
Indicative value (75th percentile) 3)	0,92	mg/min	Actual hand exposure a.s.	4,60E-03	mg a.s.
Potential hand exposure (product)	9,2	mg			
Total potential hand exposure a.s.	4,60E-02	mg a.s.	Total actual dermal exposure a.s.	4,60E-03	mg a.s.
Application (incl. Cleaning)			**Application**		
Concentration a.s.	0,50%		Actual hand exposure a.s. (including gloves)	7,71	mg a.s.
Number of cycles/day 1)	2		Potential body exposure a.s.	53,4	mg a.s.
Duration 1)	30	min	Technical protection factor: automatic piling system	2	
Actual hand exposure (product) 2)	25,7	mg/min	Actual hand exposure a.s. (including gloves and technical measures)	3,86	mg a.s.
Product on clothing (product) 2)	178	mg/min	Potential body exposure a.s. (including trechincal measures)	26,70	mg a.s.
Actual hand exposure a.s.	7,71	mg a.s.	RMM: coverall (type 6)	10%	
Potential body exposure a.s.	53,4	mg a.s.	Actual body exposure a.s.	2,67	mg a.s.
Total dermal exposure a.s.	61,11	mg a.s.			
			Total actual dermal exposure a.s.	6,53	mg a.s.
All phases			**All phases**		
Total dermal exposure all phases a.s.	61,16	mg a.s.	Total actual dermal exposure all phases a.s.	6,53	mg a.s.
Total dermal exposure all phases a.s. - corrected with density	49,17	mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	5,25	mg a.s.

1) CAR boric acid, NL June 2008, DOC IIB: M&L = 10min, Application = 30min, 2 batches/day + CAR IPBC

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) expert judgement

5) In analogy to the technical measure "full automation" agreed for immersion (see "Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013), a fully automated piling system attached to the spray tunnel is assessed by reducing the number of cylces 1.

a.s. no. 2: Tebuconazole

INHALATION EXPOSURE	TIER 1		INHALATION EXPOSURE	TIER 2	
Mixing & Loading	not expected, no aerosol		**Mixing & Loading**	not expected, no aerosol	
Application			**Application**		
Concentration a.s.	0,21%		Potential inhalation exposure a.s.	2,10E-03	mg/m³
Number of cycles/day 1)	2		Technical protection factor: automatic piling system	2	
Duration 1)	30	min	RPE: no protection, protection factor:	1	
Indicative value (75th percentile) 2)	1	mg/m³	Actual inhalation exposure 1 a.s. (considering only RPE)	2,10E-03	mg/m³
Potential inhalation exposure a.s.	2,10E-03	mg/m³			
			Additional protection factor	1	
			Actual inhalation exposure 2 a.s.	2,10E-03	mg/m³
8 h TWA	2,63E-04	mg/m³	8 h TWA (considering technical protection)	1,31E-04	mg/m³
Post-Application	not expected		**Post-Application**	not expected	
All phases			**All phases**		
Total potential inhalation exposure a.s. (8h TWA)	2,63E-04	mg/m³	Total potential inhalation exposure a.s. (8h TWA)	1,31E-04	mg/m³

DERMAL EXPOSURE	TIER 1		DERMAL EXPOSURE	TIER 2	
Mixing & Loading			**Mixing & Loading**		
Concentration a.s.	0,21%		Potential hand exposure a.s.	1,93E-02	mg a.s.
Duration 1)	10	min	RMM: protective gloves	10%	
Indicative value (75th percentile) 3)	0,92	mg/min	Actual hand exposure a.s.	1,93E-03	mg a.s.
Potential hand exposure (product)	9,2	mg			
Total potential hand exposure a.s.	1,93E-02	mg a.s.	Total actual dermal exposure a.s.	1,93E-03	mg a.s.
Application (incl. Cleaning)			**Application**		
Concentration a.s.	0,21%		Actual hand exposure a.s. (including gloves)	3,24	mg a.s.
Number of cycles/day 1)	2		Potential body exposure a.s.	22,428	mg a.s.
Duration 1)	30	min	Technical protection factor: automatic piling system	2	
Actual hand exposure (product) 2)	25,7	mg/min	Actual hand exposure a.s. (including gloves and technical measures)	1,62	mg a.s.
Product on clothing (product) 2)	178	mg/min	Potential body exposure a.s. (including trechincal measures)	11,21	mg a.s.
Actual hand exposure a.s.	3,24	mg a.s.	RMM: coverall (type 6)	10%	
Potential body exposure a.s.	22,428	mg a.s.	Actual body exposure a.s.	1,12	mg a.s.
Total dermal exposure a.s.	25,67	mg a.s.			
			Total actual dermal exposure a.s.	2,74	mg a.s.
All phases			**All phases**		
Total dermal exposure all phases a.s.	25,69	mg a.s.	Total actual dermal exposure all phases a.s.	2,74	mg a.s.
Total dermal exposure all phases a.s. - corrected with density	20,65	mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	2,20	mg a.s.

1) CAR boric acid, NL June 2008, DOC IIB: M&L = 10min, Application = 30min, 2 batches/day + CAR IPBC

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) expert judgement

5) In analogy to the technical measure "full automation" agreed for immersion (see "Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013), a fully automated piling system attached to the spray tunnel is assessed by reducing the number of cylces 1.

a.s. no. 3: Permethrin

INHALATION EXPOSURE	TIER 1		INHALATION EXPOSURE	TIER 2	
Mixing & Loading	not expected, no aerosol		**Mixing & Loading**	not expected, no aerosol	
Application			**Application**		
Concentration a.s.	0,06%		Potential inhalation exposure a.s.	6,00E-04	mg/m³
Number of cycles/day 1)	2		Technical protection factor: automatic piling system	2	
Duration 1)	30	min	RPE: no protection, protection factor:	1	
Indicative value (75th percentile) 2)	1	mg/m³	Actual inhalation exposure 1 a.s. (considering only RPE)	6,00E-04	mg/m³
Potential inhalation exposure a.s.	6,00E-04	mg/m³			
			Additional protection factor	1	
			Actual inhalation exposure 2 a.s.	6,00E-04	mg/m³

8 h TWA	7,50E-05 mg/m³	8 h TWA (considering technical protection)	3,75E-05 mg/m³
Post-Application	not expected	**Post-Application**	not expected
All phases		**All phases**	
Total potential inhalation exposure a.s. (8h TWA)	7,50E-05 mg/m³	Total potential inhalation exposure a.s. (8h TWA)	3,75E-05 mg/m³
DERMAL EXPOSURE	**TIER 1**	**DERMAL EXPOSURE**	**TIER 2**
Mixing & Loading		**Mixing & Loading**	
Concentration a.s.	0,06%	Potential hand exposure a.s.	5,52E-03 mg a.s.
Duration 1)	10 min	RMM: protective gloves	10%
Indicative value (75th percentile) 3)	0,92 mg/min	Actual hand exposure a.s.	5,52E-04 mg a.s.
Potential hand exposure (product)	9,2 mg		
Total potential hand exposure a.s.	5,52E-03 mg a.s.	Total actual dermal exposure a.s.	5,52E-04 mg a.s.
Application (incl. Cleaning)		**Application**	
Concentration a.s.	0,06%	Actual hand exposure a.s. (including gloves)	0,93 mg a.s.
Number of cycles/day 1)	2	Potential body exposure a.s.	6,408 mg a.s.
Duration 1)	30 min	Technical protection factor: automatic piling system	2
Actual hand exposure (product) 2)	25,7 mg/min	Actual hand exposure a.s. (including gloves and technical measures)	0,46 mg a.s.
Product on clothing (product) 2)	178 mg/min	Potential body exposure a.s. (including trechincal measures)	3,20 mg a.s.
Actual hand exposure a.s.	0,93 mg a.s.	RMM: coverall (type 6)	10%
Potential body exposure a.s.	6,408 mg a.s.	Actual body exposure a.s.	0,32 mg a.s.
Total dermal exposure a.s.	7,33 mg a.s.	Total actual dermal exposure a.s.	0,78 mg a.s.
All phases		**All phases**	
Total dermal exposure all phases a.s.	7,34 mg a.s.	Total actual dermal exposure all phases a.s.	0,78 mg a.s.
Total dermal exposure all phases a.s. - corrected with density	5,90 mg a.s.	Total actual dermal exposure all phases a.s. - corrected with density	0,63 mg a.s.

1) CAR boric acid, NL June 2008, DOC IIB: M&L = 10min, Application = 30min, 2 batches/day + CAR IPBC

2) Dipping model 1, TNsG Human Exposure User Guidance 2002

3) Human Exposure Expert Group (HEEG) opinion on the use of available data and models for the assessment of the exposure of operators during the loading of products into vessels or systems in industrial scale, 2008

4) expert judgement

5) In analogy to the technical measure "full automation" agreed for immersion (see "Human Exposure Export Group (HEEG) opinion "For exposure assessment for professional operators undertaking industrial treatment of wood by fully automated dipping", 2013), a fully automated piling system attached to the spray tunnel is assessed by reducing the number of cylces 1.

soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

INHALATION EXPOSURE	**TIER 1**	**INHALATION EXPOSURE**	**TIER 2**
Mixing & Loading	not expected, no aerosol	**Mixing & Loading**	not expected, no aerosol
Application		**Application**	
Exposure to aerosols	negligible compared to exposure to	Exposure to aerosols	negligible compared to exposure to vapours
Exposure to vapour	**ConsExpo**	Exposure to vapour	**ConsExpo**
Exposure level for vapour 1)	76 mg/m³	Exposure level for vapour 1)	76 mg/m³
Duration	480 min	Duration3)	480 min
Potential inhalation exposure soc (8h TWA)	76 mg/m³	Refined inhalation exposure soc, without RPE (8h TWA)	76 mg/m³
Potential inhalation exposure soc (STEL) 2)	150 mg/m³	Refined inhalation exposure soc, without RPE (STEL) 2)	150 mg/m³
		RMM: automatic piling system	1 no protection expected4)
		Actual inhalation exposure soc (8h TWA)	76 mg/m³
		Actual inhalation exposure soc (STEL)	150 mg/m³
All phases		**All phases**	
Total potential inhalation exposure soc (8h TWA)	76 mg/m³	Total actual inhalation exposure soc (8h TWA)	76 mg/m³
Total potential inhalation exposure soc (STEL)	150 mg/m³	Total potential inhalation exposure soc (STEL)	150 mg/m³

1) Calculated with ConsExpo 4.1

2) Extracted from ConsExpo 4.1 results taking the average of the 15 min interval with the highest exposure

3) Expert judgement: inhalation exposure to vapours occurs even in some distance to the spraying tunnel, thus the whole shift duration of 480 min is considered for the exposure duration as a worst case.

4) Expert judgement: inhalation exposure to vapours of the soc is notexpected to be reduced by the automatic piling system

ConsExpo calculation for soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Tier 1

Product

Product name Primer TIP

Compound

Compound name :	Hydrocarbons, C10-C13	
CAS number :		
molecular weight	160	g/mol
vapour pressure	50	Pascal

Inhalation model: Exposure to vapour : evaporation increasing area

weight fraction compound	88,6	%
exposure duration	480	minute
room volume	1500	m3
ventilation rate	5	1/hr
applied amount	90,4	kilogram
release area	500	m2
application duration	480	minute
mol weight matrix	160	g/mol
mass transfer rate	0,0146	m/min

Output

Inhalation (point estimates)

inhalation mean event concentration :	76,3	mg/m³
Short term exposure level	150	mg/m³

Application number: **006** meta-SPC 1, 2 and 3
Application: **Mechanical processing of treated wood**

Ingredient biocidal product	TIER 1		TIER 2	
	potential inhalation [mg/m³]	potential dermal [mg/day]	actual inhalation [mg/m³]	actual dermal [mg/day]
a.s. no. 1: IPBC	2,26E-03	7,42	2,26E-03	0,74
a.s. no. 2: Tebuconazole	9,50E-04	3,12	9,50E-04	0,31
a.s. no. 3: Permethrin	2,71E-04	0,89	2,71E-04	0,09
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (8h TWA)	not expected	not assessed	not expected	not assessed
soc no. 1: Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics (STEL)	not expected	not assessed	not expected	not assessed

Details of exposure assessment

			factor	RMM
application	Mechanical processing of treated wood	respiratory protection factor	1	no RMM
conc. a.s. 1	0,50%	penetration of protective gloves	10%	protective gloves
conc. a.s. 2	0,21%			
conc. a.s. 3	0,06%			
application amount b.p.	180,9 g/m²			
conc b.p. in treated wood surface 1)	90,45 kg/m³			
hand area: palms of both hands	410 cm²			
contaminated hand surface	20%			
exposed hand area	82 cm²			

a.s. no. 1: IPBC

INHALATION EXPOSURE	TIER 1	INHALATION EXPOSURE	TIER 2
Conc. a.s. in treated wood	0,45 kg/m³	Potential daily inhalation exposure a.s.	2,26E-03 mg/m³
Density of wood (soft wood) 2)	400 kg/m³	Protection factor	1
Content a.s. in wood dust	1,13E-03 mg/mg	Actual daily inhalation exposure a.s.	2,26E-03 mg/m³
Limit value for dust concentration 3)	2 mg/m³		
Potential daily inhalation exposure a.s.	2,26E-03 mg/m³		
DERMAL EXPOSURE	**TIER 1**	**DERMAL EXPOSURE**	**TIER 2**
Application amount b.p. on treated wood surface	18,09 mg /cm²	Potential daily dermal exposure a.s.	7,42 mg a.s.
Amount a.s. on treated wood surface	0,09 mg a.s./cm²	RMM: protective gloves	10%
Exposed hand area	82 cm²		
Potential daily dermal exposure a.s.	7,42 mg a.s.	Actual daily dermal exposure a.s.	0,74 mg a.s.

1) assumed penetration depth (outer layer): 0.002m; expert judgement

2) TM III/2008 MOTA

3) limit value for dust concentration according to TRGS 553: 2mg/m3

a.s. no. 2: Tebuconazole

INHALATION EXPOSURE	**TIER 1**	**INHALATION EXPOSURE**	**TIER 2**
Conc. a.s. in treated wood	0,19 g/m³	Potential daily inhalation exposure a.s.	9,50E-04 mg/m³
Density of wood (soft wood) 2)	400 kg/m³	Protection factor	1
Content a.s. in wood dust	4,75E-04 mg/mg	Actual daily inhalation exposure a.s.	9,50E-04 mg/m³
Limit value for dust concentration 3)	2 mg/m³		
Potential daily inhalation exposure a.s.	9,50E-04 mg/m³		
DERMAL EXPOSURE	**TIER 1**	**DERMAL EXPOSURE**	**TIER 2**
Application amount b.p. on treated wood surface	18,09 mg /cm²	Potential daily dermal exposure a.s.	3,12 mg a.s.
Amount a.s. on treated wood surface	0,04 mg a.s. /cm²	RMM: protective gloves	10%
Exposed hand area	82 cm²		
Potential daily dermal exposure a.s.	3,12 mg a.s.	Actual daily dermal exposure a.s.	0,31 mg a.s.

1) assumed penetration depth (outer layer): 0.002m; expert judgement

2) TM III/2008 MOTA

3) limit value for dust concentration according to TRGS 553: 2mg/m3

a.s. no. 3: Permethrin

INHALATION EXPOSURE	**TIER 1**	**INHALATION EXPOSURE**	**TIER 2**
Conc. a.s. in treated wood	0,05 g/m³	Potential daily inhalation exposure a.s.	2,71E-04 mg/m³
Density of wood (soft wood) 2)	400 kg/m³	Protection factor	1
Content a.s. in wood dust	1,36E-04 mg/mg	Actual daily inhalation exposure a.s.	2,71E-04 mg/m³
Limit value for dust concentration 3)	2 mg/m³		
Potential daily inhalation exposure a.s.	2,71E-04 mg/m³		
DERMAL EXPOSURE	**TIER 1**	**DERMAL EXPOSURE**	**TIER 2**
Application amount b.p. on treated wood surface	18,09 mg /cm²	Potential daily dermal exposure a.s.	0,89 mg a.s.
Amount a.s. on treated wood surface	0,01 mg a.s. /cm²	RMM: protective gloves	10%
Exposed hand area	82 cm²		
Potential daily dermal exposure a.s.	0,89 mg a.s.	Actual daily dermal exposure a.s.	0,09 mg a.s.

1) assumed penetration depth (outer layer): 0.002m; expert judgement

2) TM III/2008 MOTA

3) limit value for dust concentration according to TRGS 553: 2mg/m3