

ART REPORT **1** – Paint factory day 1 – 06-Aug-14

Pouring process

Chemical details

Chemical	TiO2 RD3
CAS No.	13463-67-7

Scenario details

Number of activities	3
Total duration (mins)	176
Nonexposure period (mins)	112

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	08-Jul-14
Date last edited	06-Aug-14

Details for Activity BB TiO2 RD3 (4x500kg)

Emission sources: Near field ✓
 Far field

Duration (mins): 20

Near-field exposure

Operational Conditions

<i>Substance emission potential</i>	
Substance product type	Powders, granules or pelletised material
Dustiness	5.318 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

<i>Activity emission potential</i>	
Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

<i>Surface contamination</i>	
Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

<i>Dispersion</i>	
Work area	Indoors
Room size	3000 m ³

Risk Management Measures

<i>Localised controls</i>	
Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

<i>Dispersion</i>	
Ventilation rate	3 air changes per hour (ACH)

Details for Activity SB 260 kg TiO2 RD3

Emission sources: Near field
 Far field

Duration (mins): 23

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	5.318 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Details for Activity SB 422 kg Micro Mica

Emission sources: Near field
 Far field

Duration (mins): 21

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	22.352 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 0.77 mg/m³.

The inter-quartile confidence interval is 0.41 mg/m³ to 1.5 mg/m³.

ART REPORT 2 – Paint factory, day 2 – 06-Aug-14

Pouring process

Chemical details

Chemical	TiO2 TR92
CAS No.	13463-67-7

Scenario details

Number of activities	4
Total duration (mins)	272
Nonexposure period (mins)	186

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	15-Jul-14
Date last edited	15-Jul-14

Details for Activity BB 5x500 TiO2 TR92

Emission sources: Near field
 Far field

Duration (mins): 26

Near-field exposure

Operational Conditions

<i>Substance emission potential</i>	
Substance product type	Powders, granules or pelletised material
Dustiness	1.577 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

<i>Activity emission potential</i>	
Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

<i>Surface contamination</i>	
Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

<i>Dispersion</i>	
Work area	Indoors
Room size	3000 m ³

Risk Management Measures

<i>Localised controls</i>	
Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

<i>Dispersion</i>	
Ventilation rate	3 air changes per hour (ACH)

Details for Activity SB 407 kg Satintone

Emission sources: Near field
 Far field

Duration (mins): 31

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	2.44 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Details for Activity SB 275 kg Microdol

Emission sources: Near field
 Far field

Duration (mins): 10

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	12.131 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Details for Activity BB 2x500 kg Microdol

Emission sources: Near field
Far field

Duration (mins): 19

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	12.131 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 0.55 mg/m³.

The inter-quartile confidence interval is 0.29 mg/m³ to 1.1 mg/m³.

ART REPORT **3** – **BB RD3** – 06-Aug-14

Pouring process

Chemical details

Chemical	TiO2 RD3
CAS No.	13463-67-7

Scenario details

Number of activities	1
Total duration (mins)	20
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	08-Jul-14
Date last edited	06-Aug-14

Details for Activity BB TiO2 RD3 (4x500kg)

Emission sources: Near field
 Far field

Duration (mins): 20

Near-field exposure

Operational Conditions

<i>Substance emission potential</i>	
Substance product type	Powders, granules or pelletised material
Dustiness	5.318 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

<i>Activity emission potential</i>	
Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

<i>Surface contamination</i>	
Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

<i>Dispersion</i>	
Work area	Indoors
Room size	3000 m ³

Risk Management Measures

<i>Localised controls</i>	
Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

<i>Dispersion</i>	
Ventilation rate	3 air changes per hour (ACH)

Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 0.9 mg/m³.

The inter-quartile confidence interval is 0.47 mg/m³ to 1.7 mg/m³.

ART REPORT 4 – BB TR92 – 06-Aug-14

Pouring process

Chemical details

Chemical	TiO2 TR92
CAS No.	13463-67-7

Scenario details

Number of activities	1
Total duration (mins)	26
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	15-Jul-14
Date last edited	06-Aug-14

Details for Activity BB 5x500 TiO2 TR92

Emission sources: Near field
 Far field

Duration (mins): 26

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	1.577 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 0.89 mg/m³.

The inter-quartile confidence interval is 0.47 mg/m³ to 1.7 mg/m³.

ART REPORT 5 – BB Microdol – 06-Aug-14

Pouring process

Chemical details

Chemical	Microdol
CAS No.	

Scenario details

Number of activities	1
Total duration (mins)	19
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	15-Jul-14
Date last edited	06-Aug-14

Details for Activity BB 2x500 kg Microdol

Emission sources: Near field
 Far field

Duration (mins): 19

Near-field exposure

Operational Conditions

<i>Substance emission potential</i>	
Substance product type	Powders, granules or pelletised material
Dustiness	12.131 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

<i>Activity emission potential</i>	
Activity class	Falling powders
Situation	Transferring 100 – 1000 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

<i>Surface contamination</i>	
Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

<i>Dispersion</i>	
Work area	Indoors
Room size	3000 m ³

Risk Management Measures

<i>Localised controls</i>	
Primary	Low level containment (90.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

<i>Dispersion</i>	
Ventilation rate	3 air changes per hour (ACH)

Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 0.89 mg/m³.

The inter-quartile confidence interval is 0.47 mg/m³ to 1.7 mg/m³.

ART REPORT **6** – **SB RD3** – 06-Aug-14

Pouring process

Chemical details

Chemical	TiO2 RD3
CAS No.	13463-67-7

Scenario details

Number of activities	1
Total duration (mins)	23
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	08-Jul-14
Date last edited	06-Aug-14

Details for Activity SB 260 kg TiO2 RD3

Emission sources: Near field
 Far field

Duration (mins): 23

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	5.318 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 2.7 mg/m³.

The inter-quartile confidence interval is 1.4 mg/m³ to 5.1 mg/m³.

ART REPORT 7 – SB Micro Mica – 06-Aug-14

Pouring process

Chemical details

Chemical	Micro Mica
CAS No.	

Scenario details

Number of activities	1
Total duration (mins)	21
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	08-Jul-14
Date last edited	06-Aug-14

Details for Activity SB 422 kg Micro Mica

Emission sources: Near field
 Far field

Duration (mins): 21

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	22.352 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 2.7 mg/m³.

The inter-quartile confidence interval is 1.4 mg/m³ to 5.1 mg/m³.

ART REPORT 8 – SB Satin Tone – 06-Aug-14

Pouring process

Chemical details

Chemical	Satin Tone
CAS No.	

Scenario details

Number of activities	1
Total duration (mins)	31
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	15-Jul-14
Date last edited	06-Aug-14

Details for Activity SB 407 kg Satintone

Emission sources: Near field
 Far field

Duration (mins): 31

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	2.44 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 2.7 mg/m³.

The inter-quartile confidence interval is 1.4 mg/m³ to 5.2 mg/m³.

ART REPORT 9 – SB Microdol – 06-Aug-14

Pouring process

Chemical details

Chemical	Microdol
CAS No.	

Scenario details

Number of activities	1
Total duration (mins)	10
Nonexposure period (mins)	0

Metadata

ART version	1.5
Creator	joonas.koivisto@ttl.fi
Date created	15-Jul-14
Date last edited	06-Aug-14

Details for Activity SB 275 kg Microdol

Emission sources: Near field
 Far field

Duration (mins): 10

Near-field exposure

Operational Conditions

Substance emission potential

Substance product type	Powders, granules or pelletised material
Dustiness	12.131 mg/kg for inhalable fraction
Moisture content	Dry product (< 5 % moisture content)
Powder weight fraction	1

Activity emission potential

Activity class	Falling powders
Situation	Transferring 10 – 100 kg/minute
Handling type	Routine transfer
Drop height	Drop height > 0.5 m
Containment level	Open process

Surface contamination

Process fully enclosed?	No
Effective housekeeping practices in place?	Yes

Dispersion

Work area	Indoors
Room size	3000 m ³

Risk Management Measures

Localised controls

Primary	No localized controls (0.00 % reduction)
Secondary	No localized controls (0.00 % reduction)

Dispersion

Ventilation rate	3 air changes per hour (ACH)
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Predicted exposure levels

ART predicts air concentrations in a worker's personal breathing zone outside of any Respiratory Protection Equipment (RPE). The use of RPE must be considered separately.

Mechanistic model results

The predicted 75th percentile full-shift exposure is 2.7 mg/m³.

The inter-quartile confidence interval is 1.4 mg/m³ to 5.1 mg/m³.