

Toxic Substance Reduction – Progress Report: 2018

Copper

Facility-level quantification data, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 1.

Table 1: Summary - Facility Level Quantifications for Copper		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U: 96,043 kg	U: 96,567 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	0 kg	0 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed (on site) by the facility:	0 kg	0 kg
Disposed (off site) by the facility:	Wastewater: 9.56 kg	Wastewater: 6.1 kg
Transferred (for recycling) from the facility:	TR: 2,568 kg	TR: 1,245 kg
Contained in product that leaves the facility:	P: 93,465 kg	P: 95,315 kg

COMPARISON OF THE RESULTS PRESENTED IN TABLE 1

It has been assumed that the total steel tube processed is equal to the total steel purchased in 2018; this assumption may not accurately reflect the total copper actually used in 2018 as the amount of materials containing copper carried over from 2017, and what remained in storage for use in 2019, was unknown at the time of writing this progress report. TI Automotive attributed the general change in annual production levels from 2017 to 2018 for the variance in the quantities presented in Table 1. The copper masses disposed with waste water, transferred for recycling, and contained in final product were within the expected range of variance for 2017 and 2018.



REDUCTION OBJECTIVES

TI Automotive does not intend to reduce the amount of copper at this facility. The technical and economical feasibility analyses for potential toxics reduction options for copper usage at TI Automotive resulted in the identification of zero potentially-feasible options at the time of preparing the TSRP. TI Automotive is, however, committed to ensuring copper is used in the most responsible and efficient manner. No amendments were made to the current toxic substance reduction plan for copper in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Copper

A handwritten signature in blue ink, appearing to read "Derek McDonald".

Derek McDonald
Plant Manager
TI Automotive Canada Inc.

Toxic Substance Reduction – Progress Report: 2018

Hexavalent Chromium (Hex-Cr)

FACILITY-WIDE ACCOUNTING INFORMATION

Facility-level quantification data for hex-Cr, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 2.

Table 2: Summary - Facility Level Quantifications for Hex-Cr		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U _{tp} = 633 kg	U _{tp} = 638 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	233.0 kg	247.0 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed (on site) by the facility:	0 kg	0 kg
Disposed (off site) by the facility:	MHC: 14.0 kg, Wastewater: 1.0 kg	MHC: 11.0 kg, Wastewater: 0.9 kg
Transferred (for recycling) from the facility:	27.0 kg	27.0 kg
Contained in product that leaves the facility:	P: 591.3 kg	P: 613.0 kg

Table Notes: U_{tp} = Used steel strip and steel tube with hexavalent chromium within the six Tube-Production Processes
 U_p = Used hexavalent chrome in a chromium plating bath within the Plating Process
 MHC = Metal Hydroxide Cake (waste generated from on-site wastewater treatment process)
 kg = kilograms

COMPARISON OF THE RESULTS PRESENTED IN TABLE 2

The change in the mass of hex-Cr used in steel strip is attributed to the expected general change in annual production level from 2017 to 2018. Hex-Cr used in the chromium plating bath has been phased out from plating processes at TI Automotive as of 2012. The change in masses of hex-Cr released to air, disposed at an off-site landfill and with wastewater, transferred for



recycling, and contained in product were within the expected range of variance for 2017 and 2018. It should be noted that since the amount of materials containing hex-Cr carried over from 2017, and what remained in storage for use in 2019, was unknown, it is assumed that the total steel tube processed is equal to the total steel purchased in 2018.

REDUCTION OBJECTIVES

TI Automotive's goal for Hex-Cr, as outlined in the current TSRP, is to eliminate:

- 100% of hexavalent chromium-containing solution introduced to the plating process.
- 0.7% of hexavalent chromium disposed to hazardous waste,
- 0.6% of hexavalent chromium recycled at an off-site facility, and
- 0.5% of hexavalent chromium from the finished product at TI Automotive.

As of 2018, the implementation plan for achieving this reduction goal has been achieved.

TOXIC-SUBSTANCE REDUCTION OPTION (IMPLEMENTED)

The following option to reduce the use or release of hexavalent chromium was identified in the current TSRP:

- Substitute hexavalent chromium in the plating bath with trivalent chromium and has been fully implemented.

Hexavalent chromium reductions due to implementing this option are outlined in Table 3:

Table 3: Reduction Option - Substitute Hexavalent Chromium with Trivalent Chromium in Plating Bath									
Option(s)	Used	Created	On-Site Releases			Disposal		Transfer Off-site for Recycling	Contained in Product
			Air	Water	Land	On-site	Off-site*		
2011 (Baseline)	U _{tp} =1014.4 kg U _p =6.5 kg Total = 1020.9 kg	0 kg	256.0 kg	0 kg	0 kg	0 kg	MHC: 101.1 kg Wastewater: 0.3 kg	69.7 kg	1058.2 kg
2012	U _{tp} = 815.0 kg U _p = 3.5 kg Total = 818.9 kg	0 kg	154.3 kg	0 kg	0 kg	0 kg	MHC: 201.8 kg Wastewater: 1.3 kg	71.4 kg	544.4 kg
2013	U _{tp} = 774.0 kg U _p = 0 kg total = 774.0 kg	0 kg	350.0 kg	0 kg	0 kg	0 kg	MHC: 178.0 kg Wastewater: 4.9 kg	38.6 kg	552.9 kg
2014	U _{tp} = 423.0 kg U _p = 0 kg total = 423.0 kg	0 kg	326.0 kg	0 kg	0 kg	0 kg	MHC: 219.0 kg Wastewater: 3.0 kg	33.0 kg	167.7 kg
2015	U _{tp} = 710.0 kg U _p = 0 kg total = 710.0 kg	0 kg	320.0 kg	0 kg	0 kg	0 kg	MHC: 17.0 kg Wastewater: 2.0 kg	19.0 kg	672.2 kg
2016	U _{tp} = 794 kg U _p = 0 kg total = 794 kg	0 kg	275 kg.	0	0	0	MHC: 13.0 kg Wastewater: 1.0 kg	30.0 kg	749.6 kg
2017	U _{tp} = 633 kg U _p = 0 kg total = 633 kg	0 kg	233 kg.	0	0	0	MHC: 14.0 kg Wastewater: 1.0 kg	27.0 kg	591.3 kg
2018	U _{tp} = 638 kg U _p = 0 kg total = 638 kg	0 kg	247 kg.	0	0	0	MHC: 11.0 kg Wastewater: 0.9 kg	13.0 kg	613.0 kg
Reduction (baseline to 2018)	U _{tp} = 376 kg U _p = 6.5 kg	0 kg	9 kg	0 kg	0 kg	0 kg	MHC: 90.1 kg Wastewater: +0.6 kg	56.7 kg	445.2 kg
% Reduction from baseline	U _{tp} = 37.1% U _p = 100%	0%	- 3.51%	0%	0%	0%	MHC: 89.11% Wastewater: No reduction	81.34%	42.07%



Table Notes: U_{ip} = Used steel strip and steel tube with hexavalent chromium within the six Tube-Production Processes
U_p = Used hexavalent chrome in a chromium plating bath within the Plating Process
MHC = Metal Hydroxide Cake (waste generated from on-site wastewater treatment process)
kg = kilograms

The current TSRP indicates that the solution containing hex-Cr used in the zinc plating bath line has been phased out in 2012; 100% reduction in the hex-Cr U_p quantity has been achieved. This reduction, along with the change in masses of hex-Cr released to air, disposed at an off-site landfill and with wastewater, and transferred for recycling were within the expected range of variance for 2017 and 2018. No additional actions were taken in 2018 to reduce the use, creation, discharge to air, land, or water of hex-Cr at TI Automotive. The steps taken in 2018 to reduce hex-Cr at TI Automotive are consistent with those outlined in the current TSRP. No amendments were made to the current toxic substance reduction plan for hex-Cr in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Hexavalent Chromium

A handwritten signature in blue ink, appearing to read "Derek McDonald".

Derek McDonald
Plant Manager
TI Automotive Canada Inc.

Toxic Substance Reduction – Progress Report: 2018

Hydrochloric Acid

FACILITY-WIDE ACCOUNTING INFORMATION

Facility-level quantification data for hydrochloric acid, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 4.

Table 4: Summary - Facility Level Quantifications for Hydrochloric acid		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U: 44,635 kg	U: 35,371 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	178 kg	102 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed (on site) by the facility:	0 kg	0 kg
Disposed (off site) by the facility:	0 kg	0 kg
Transferred (for recycling) from the facility:	0 kg	0 kg
Contained in product that leaves the facility:	0 kg	0 kg
Destroyed by process(es) at the facility	44,457 kg	35,269 kg

COMPARISON OF THE RESULTS PRESENTED IN TABLE 4

The general change in annual production levels from 2017 to 2018 accounts for the variance in the quantities used, released to air, and destroyed by processes at the facility.



REDUCTION OBJECTIVES

TI Automotive does not intend to reduce the amount of hydrochloric acid used at this facility. The technical and economical feasibility analyses for potential toxics reduction options for hydrochloric acid usage at TI Automotive resulted in the identification of zero potentially-feasible options at the time of preparing the TSRP. TI Automotive is, however, committed to ensuring hydrochloric acid is used in the most responsible and efficient manner. No amendments were made to the current toxic substance reduction plan for hydrochloric acid in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Hydrochloric Acid

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Derek McDonald
Plant Manager
TI Automotive Canada Inc.

Toxic Substance Reduction – Progress Report: 2018

Nickel

FACILITY-WIDE ACCOUNTING INFORMATION

Facility-level quantification data for Nickel, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 5.

Table 5: Summary - Facility Level Quantifications for Nickel		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U: 9,432 kg	U: 9,612 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	233.0 kg	247.0 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed of (on-site) by the facility:	0 kg	0 kg
Disposed of (off-site) by the facility:	Wastewater: 2.56 kg	Wastewater: 3.2 kg
Transferred (for recycling) from the facility:	613 kg	296 kg
Contained in product that leaves the facility:	P: 8,582 kg	P: 9,066 kg

COMPARISON OF THE RESULTS PRESENTED IN TABLE 5

It is assumed that the total steel tube processed is equal to the total steel purchased in 2018; this assumption may not accurately reflect the total nickel actually used in 2018 as the amount of materials containing nickel carried over from 2017, and what remained in storage for use in 2019, was unknown to the writer at the time of writing this progress report. TI Automotive attributed the general change in annual production levels from 2017 to 2018 for the variance in the quantities presented in Table 5. The nickel masses disposed with waste water, transferred for



recycling, and contained in final product were within the expected range of variance for 2017 and 2018.

REDUCTION OBJECTIVES

TI Automotive does not intend to reduce the amount of nickel at this facility. The technical and economical feasibility analyses for potential toxics reduction options for nickel usage at TI Automotive resulted in the identification of zero potentially-feasible options at the time of preparing the TSRP. TI Automotive is, however, committed to ensuring nickel is used in the most responsible and efficient manner. No amendments were made to the current toxic substance reduction plan for nickel in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Nickel

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Derek McDonald
Plant Manager
TI Automotive Canada Inc.

Toxic Substance Reduction – Progress Report: 2018

Sulphuric Acid

FACILITY-WIDE ACCOUNTING INFORMATION

Facility-level quantification data for sulphuric acid, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 6.

Table 6: Summary - Facility Level Quantifications for Sulphuric acid		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U: 33,799 kg	U: 35,444 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	656 kg	376 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed of (on-site) by the facility:	0 kg	0 kg
Disposed of (off-site) by the facility:	0 kg	0 kg
Transferred (for recycling) from the facility:	0 kg	0 kg
Contained in product that leaves the facility:	0 kg	0 kg
Destroyed by process(es) at the facility	33,143 kg	35,068 kg

COMPARISON OF THE RESULTS PRESENTED IN TABLE 6

The general change in annual production levels from 2017 to 2018 accounts for the variance in the quantities used, released to air, and destroyed by processes at the facility.



REDUCTION OBJECTIVES

TI Automotive does not intend to reduce the amount of sulphuric acid used at this facility. The technical and economical feasibility analyses for potential toxics reduction options for sulphuric acid usage at TI Automotive resulted in the identification of zero potentially-feasible options at the time of preparing the TSRP. TI Automotive is, however, committed to ensuring sulphuric acid is used in the most responsible and efficient manner. No amendments were made to the current toxic substance reduction plan for sulphuric acid in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Sulphuric Acid

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Derek McDonald
Plant Manager
TI Automotive Canada Inc.

Toxic Substance Reduction – Progress Report: 2018

Zinc

FACILITY-WIDE ACCOUNTING INFORMATION

Facility-level quantification data, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2017 and 2018, is outlined in Table 7.

Table 7: Summary - Facility Level Quantifications for Zinc		
Form of Involvement	2017 Amount of Substance (kg)	2018 Amount of Substance (kg)
Enters the facility (use):	U: 119,136 kg	U: 79,390 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	0 kg	0 kg
Released (land) from the facility:	0 kg	0 kg
Released (water) from the facility:	0 kg	0 kg
Disposed of (on-site) by the facility:	0 kg	0 kg
Disposed of (off-site) by the facility:	MHC: 14.063 kg, Wastewater: 23.0 kg	MHC: 11.728 kg, Wastewater: 10.0 kg
Transferred (for recycling) from the facility:	Zn Stubs: 0.0 kg Scrap: 4,481 kg	Zn Stubs: 0.0 kg Scrap: 2,177 kg
Contained in product that leaves the facility:	P: 100,569 kg	P: 65,476 kg

COMPARISON OF THE RESULTS PRESENTED IN TABLE 7

TI Automotive attributed the general change in annual production levels from 2017 to 2018 for the increased quantities of Zinc entering the facility and contained in product, as presented in Table 1. The zinc masses disposed as metal hydroxide cake (MHC), disposed with waste water, and transferred for recycling were within the expected range of variance for 2017 and 2018.



REDUCTION OBJECTIVES

TI Automotive does not intend to reduce the amount of zinc at this facility. The technical and economical feasibility analyses for potential toxics reduction options for zinc usage at TI Automotive resulted in the identification of zero potentially-feasible options at the time of preparing the TSRP. TI Automotive is, however, committed to ensuring zinc is used in the most responsible and efficient manner. No amendments were made to the current toxic substance reduction plan for zinc in 2018.

CONFIRMATION BY HIGHEST RANKING EMPLOYEE

As of June 1, 2019, I, Derek McDonald, confirm that I have read the report on the toxic substance reduction plan for the toxic substance referred to below and am familiar with its contents, and, to my knowledge, the information contained in that report and this annual progress report is factually accurate and, complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

Zinc

A handwritten signature in blue ink, appearing to read "Derek McDonald".

Derek McDonald
Plant Manager
TI Automotive Canada Inc.