

## **Toxic Substance Reduction – Progress Reports: 2017**

### **Copper**

Facility-level quantification data, determined as a result of the toxics substance accounting performed at TI Automotive for the years 2016 and 2017, is outlined in Table 1.

<b>Table 1: Summary - Facility Level Quantifications for Copper</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U: 96,940 kg	U: 96,043 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: 10.24 kg	Wastewater: 9.56 kg
Transferred (for recycling) from the facility:	TR: 2,298 kg	TR: 2,568 kg
Contained in product that leaves the facility:	P: 94,632 kg	P: 93,465 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 2017; this assumption may not accurately reflect the total copper actually used in 2017 as the amount of materials containing copper carried over from 2016, and what remained in storage for use in 2018, was unknown at the time of writing this progress report. TI Automotive attributed the general change in annual production levels from 2016 to 2017 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 2016 and 2017.



## **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 2017.

## **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

As of June 1, 2018, 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

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Derek McDonald  
*Plant Manager*  
TI Automotive Canada Inc.

**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 2016 and 2017, is outlined in Table 2.

<b>Table 2: Summary - Facility Level Quantifications for Hex-Cr</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U <sub>tp</sub> = 794 kg	U <sub>tp</sub> = 633 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	275.0 kg	233.0 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: 13.0 kg, Wastewater: 1.0 kg	MHC: 14.0 kg, Wastewater: 1.0 kg
Transferred (for recycling) from the facility:	30.0 kg	27.0 kg
Contained in product that leaves the facility:	P: 749.6 kg	P: 591.3 kg

Table Notes: U<sub>tp</sub> = Used steel strip and steel tube with hexavalent chromium within the six Tube-Production Processes  
 U<sub>p</sub> = 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 reduced mass of hex-Cr used in steel strip is attributed to the expected general change in annual production level from 2016 to 2017. Hex-Cr used in the chromium plating bath has been phased out from plating processes at TI Automotive. 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 2016 and 2017. It should be noted that



since the amount of materials containing hex-Cr carried over from 2016, and what remained in storage for use in 2018, was unknown, it is assumed that the total steel tube processed is equal to the total steel purchased in 2017.

## **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 2017, 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:

<b>Table 3: Reduction Option - Substitute Hexavalent Chromium with Trivalent Chromium in Plating Bath</b>									
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 <sub>tp</sub> =1014.4 kg U <sub>p</sub> =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 <sub>tp</sub> = 815.0 kg U <sub>p</sub> = 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 <sub>tp</sub> = 774.0 kg U <sub>p</sub> = 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 <sub>tp</sub> = 423.0 kg U <sub>p</sub> = 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 <sub>tp</sub> = 710.0 kg U <sub>p</sub> = 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 <sub>tp</sub> = 794 kg U <sub>p</sub> = 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 <sub>tp</sub> = 633 kg U <sub>p</sub> = 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
Reduction (baseline to 2016)	U <sub>tp</sub> = 381 kg U <sub>p</sub> = 6.5 kg	0 kg	23 kg	0 kg	0 kg	0 kg	MHC: 87.1 kg Wastewater: +0.7 kg	42.7 kg	466.9 kg
% Reduction from baseline	U <sub>tp</sub> = 37.6% U <sub>p</sub> = 100%	0%	- 8.98%	0%	0%	0%	MHC: 86.15% Wastewater: No reduction	61.26%	44.12%

Table Notes: U<sub>tp</sub> = Used steel strip and steel tube with hexavalent chromium within the six Tube-Production Processes  
 U<sub>p</sub> = 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 2016 and 2017. No additional actions were taken in 2017 to reduce the use, creation, discharge to air, land, or water of hex-Cr at TI Automotive. The steps taken in 2017 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 2017.

### **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

As of June 1, 2018, 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.

**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 2016 and 2017, is outlined in Table 4.

<b>Table 4: Summary - Facility Level Quantifications for Hydrochloric acid</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U: 49,159 kg	U: 44,635 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	265 kg	178 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	48,894 kg	44,457 kg

**COMPARISON OF THE RESULTS PRESENTED IN TABLE 4**

The general change in annual production levels from 2016 to 2017 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 2017.

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## **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

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Hydrochloric Acid

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Derek McDonald  
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TI Automotive Canada Inc.



**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 2016 and 2017, is outlined in Table 5.

<b>Table 5: Summary - Facility Level Quantifications for Nickel</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U: 18,952 kg	U: 9,432 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	275.0 kg	233.0 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: 2.5 kg	Wastewater: 2.56 kg
Transferred (for recycling) from the facility:	850 kg	613 kg
Contained in product that leaves the facility:	P: 17,824 kg	P: 8,582 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 2017; this assumption may not accurately reflect the total nickel actually used in 2017 as the amount of materials containing nickel carried over from 2016, and what remained in storage for use in 2018, was unknown to the writer at the time of writing this progress report. TI Automotive attributed the general change in annual production levels from 2016 to 2017 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 2016 and 2017.



## **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 2017.

## **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

As of June 1, 2018, 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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**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 2015 and 2016, is outlined in Table 6.

<b>Table 6: Summary - Facility Level Quantifications for Sulphuric acid</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U: 37,635 kg	U: 33,799 kg
Created at the facility:	0 kg	0 kg
Released (air) from the facility:	979 kg	10,304 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	36,656 kg	23,495 kg

**COMPARISON OF THE RESULTS PRESENTED IN TABLE 6**

The general change in annual production levels from 2016 to 2017 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 2017.

### **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

As of June 1, 2018, 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.

**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 2016 and 2017, is outlined in Table 7.

<b>Table 7: Summary - Facility Level Quantifications for Zinc</b>		
<b>Form of Involvement</b>	<b>2016 Amount of Substance (kg)</b>	<b>2017 Amount of Substance (kg)</b>
Enters the facility (use):	U: 193,876.0 kg	U: 119,136 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: 13,174.0 kg, Wastewater: 20.0 kg	MHC: 14.063 kg, Wastewater: 23.0 kg
Transferred (for recycling) from the facility:	Zn Stubs: 2538.0 kg Scrap: 4,606 kg	Zn Stubs: 0.0 kg Scrap: 4,481 kg
Contained in product that leaves the facility:	P: 173,539 kg	P: 100,569 kg

**COMPARISON OF THE RESULTS PRESENTED IN TABLE 7**

TI Automotive attributed the general change in annual production levels from 2016 to 2017 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 2016 and 2017.



## **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 sulphuric acid in 2017.

## **CONFIRMATION BY HIGHEST RANKING EMPLOYEE**

As of June 1, 2018, 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".

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