



Progress Report on Chemical Management 2020

Fast Retailing Co., Ltd.
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1 Introduction

In 2013, Fast Retailing (FR) committed to the goal of eliminating all hazardous chemicals from the whole lifecycle and all production procedures that are associated with the making and using of all products FR sells by January 2020. Within this commitment, FR developed the following four specific targets and corresponding action plans:

- 1) Supply-chain disclosure;
- 2) Alkylphenol Ethoxylates (APEOs) elimination;
- 3) Perfluorinated and Polyfluorinated Chemicals (PFCs) elimination; and
- 4) Eliminating 11 groups of hazardous chemicals.

The purpose of this Progress Report is to summarize the work undertaken over the year 2019, the progress made by FR towards the commitment since 2013, and possible development beyond 2020.

2 MRSL and Guideline

2.1 FR and ZDHC MRSL for Chemical Input Management

Towards the goal of a more comprehensive control of chemical substances, FR has created a restricted substances list not only for our products but also for manufacturing.

The Zero Discharge of Hazardous Chemicals (ZDHC) Manufacturing Restricted Substance List (MRSL) provides standardized requirement for managing chemicals input to the manufacturing process. Based on the ZDHC MRSL, FR has added additional requirement on its MRSL, in order to achieve the goal of a more comprehensive control of input chemical substances at its production processes.

The updated [FR Manufacturing Restricted Substances List \(MRSL\)](#) was released to the FR supplier facilities in May 2019.

2.2 ZDHC Wastewater Guideline

The standardized guideline is necessary for input management as well as output monitoring. In 2013, at the early stage of the program development, FR established and started to implement its own Wastewater RSL against the wastewater sampling results, but in order to set the benchmark against industry-wide performance, FR replaced the Wastewater RSL with the ZDHC Wastewater Guideline in early 2019. The ZDHC Wastewater Guideline becomes the compliance benchmark for assessing the performance of FR supplier facilities on the zero discharge of hazardous chemicals.

The assessment in the Progress Report is made against the latest release of the [ZDHC Wastewater Guideline V1.1](#).

2.3 FR Chemical Management Guideline

FR has developed the FR Chemical Management Guideline and released to FR supplier facilities in May 2019. This comprehensive guideline summarizes all our

requirements and expectations as well as specific standards to meet across input, process and output management and is also useful as suppliers' capacity building.

2.4 Best Practices Guide for Chemical Management

A Best Practices Guide for Chemical Management has been developed, based on actual management and operational practices by FR supplier facilities. This information is collected during site assessment over 2019.

The purpose of the Guide is for supplier capacity building and providing guidance on hazardous chemical management through peer learning among supplier facilities.

3 Monitoring and Disclosure

3.1 Supplier List

As early as June 2013, Fast Retailing started its sampling program to monitor hazardous waste discharge in the wastewater from its key fabric mills. Since then the number of supplier facilities under monitoring has increased steadily from 20 fabric mills in 2013 to 56 fabric mills in 2019. This represents the company's commitment to increase its effort to support the long-term goal of eliminating all hazardous chemicals from its production procedures.

The 56 fabric mills include core fabric mills outside of Japan, disclosed in [the UNIQLO Core Fabric Mill List as of 26 April 2019](#). These 56 fabric mills are located in a number of countries including China, Vietnam, and Indonesia. In addition to core fabric mills, FR has included non-core fabric mills to increase coverage of the supply chain.

FR is planning to expand the sampling program from 2020, to include sewing factories with wet processing facility. In general, the sewing factories are expected to have less hazardous chemical uses than fabric mills. FR started the wastewater monitoring program by engaging supplier facilities, i.e., the fabric mills, with higher potential environmental impact than sewing factories.

3.2 Wastewater Sampling Program

FR initiated the hazardous chemical wastewater sampling program in June 2013, based on the hazardous chemical groups in the Wastewater RSL.

Since early 2019, FR has adopted the ZDHC Wastewater Guideline, published by the ZDHC Program, as the wastewater guideline for its supply facilities. This is an important initiative to be aligned with the industrial standard.

The wastewater sampling program includes both conventional parameters group, heavy metals group and 14 priority chemical groups, for a total of 250 different parameters.

Two wastewater sampling events are conducted annually, with the first event in March/April and the second event in September/October.

The sampling is undertaken by approved laboratories including SGS and Bureau Veritas. The discharge data are uploaded to [IPE detox platform](#).

4 Wastewater Testing Results 2019 & Trend Analysis

4.1 Wastewater Sampling Events

The wastewater sampling results presented in this Progress Report are from the most recent September/October 2019 sampling event, representing the latest progress by FR supplier facilities. The coverage of this sampling event is illustrated in Figure 4-1 below.

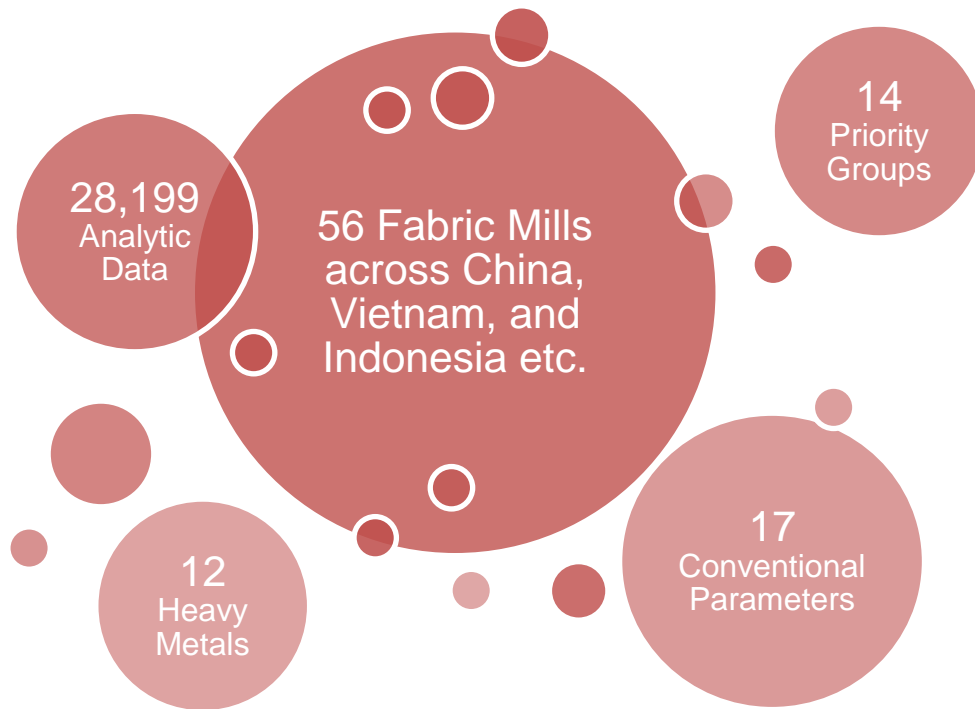


Figure 4-1 : Coverage of Wastewater Sampling Event in September/October 2019

4.2 Wastewater Testing Results 2019

The wastewater testing results are discussed under two different groups:

- the 14 MRSL parameter groups; and
- the conventional heavy metal group.

MRSL parameters are assessed against their reporting limits. Below the reporting limit, the MRSL parameter is considered to be Not Detected (ND); vice versus, the parameter is Detected (D) if it is above the reporting limit.

The conventional heavy metal parameters are assessed following a three-level approach, classified into foundational, progressive and aspirational depending on the discharge concentration.

The compliance status is assessed using the “After Treatment” wastewater quality results.

4.2.1 The 14 MRSL Parameter Groups

The testing results showing the percentage compliance against the ZDHC Wastewater Standard by the 14 MRSL parameter groups are shown in Figure 4-2, where corrections were made for detections where the facility is not clearly the net contributor.

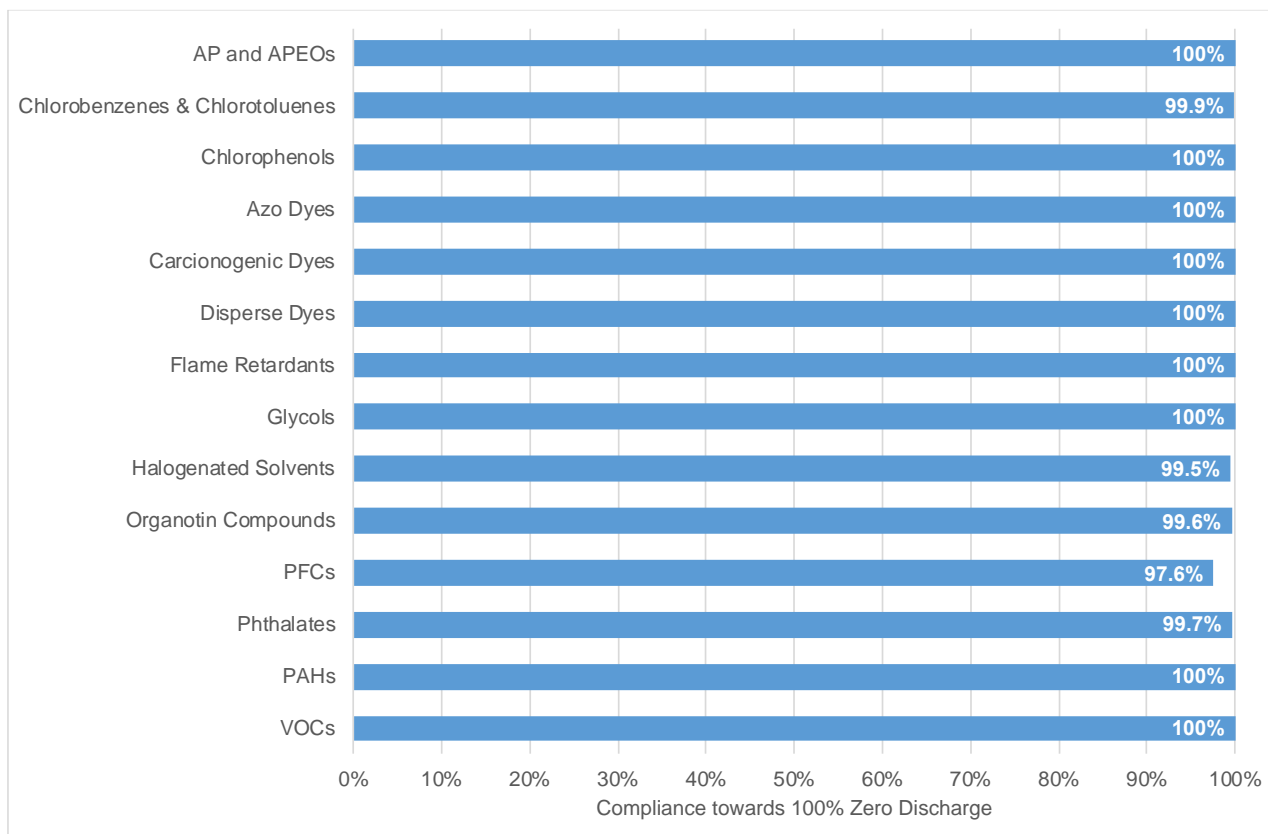


Figure 4-2 : Percentage % achieving ZDHC Wastewater Limits by MRSL Parameter Group – Final

The results can be largely grouped into the following 3 categories:

Table 4-1: Overview of the MRSL Parameter Groups compliance

Compliance %	Chemical Groups	
100%	9 Groups	AP & APEOs, Chlorophenols, Azo Dyes, Carcinogenic Dyes, Disperse Dyes, Flame Retardants, Glycols, PAHs, VOCs
>99.5%	4 Groups	Chlorobenzenes & Chlorotoluenes, Halogenated Solvents, Organotin Compounds, Phthalates
>95%	1 Group:	PFCs

In 2019, 9 of the 14 priority chemical groups have shown to achieve 100% zero discharge. 4 groups are almost at 100% zero discharge, between 99.5% to 99.9% compliance. And 1 group is shown to be at 97.6% compliance for zero discharge. Overall, the total number of positive detections for all 14 hazardous chemical groups is 15. The overall compliance towards zero is 99.8% from the 56 supplier facilities.

Chlorobenzenes & Chlorotoluene Group

For the Chlorobenzenes & Chlorotoluene group, 1 positive detection for 1,2-Dichlorobenzene at a facility in China is recorded for the “After Treatment” Wastewater

sample. But no such chemical is detected in the Before Treatment raw wastewater. Checking at past sampling records at the facility for 7 sampling events over 2013 through to 2019, no positive detection for 1,2-Dichlorobenzene was ever recorded. This one-off detection at the facility for 1,2-Dichlorobenzene is highly likely due to sampling analysis error.

In other words, the detection at this supplier facility is unlikely due to the chemical usage with 1,2-Dichlorobenzene in production.

Halogenated Solvent Group

For the Halogenated Solvent group, 1 positive detection for Methylene Chloride at a facility in Indonesia is recorded for the “After Treatment” Wastewater sample. But no such chemical is detected in the “Before Treatment” raw wastewater. Again, checking the past two sampling events in 2018 and early 2019, no positive detection of halogenated solvent chemicals was recorded for the site.

In other words, the detection at these supplier facilities is unlikely due to the halogenated solvent usage in production.

Organotin Compounds Group

For the Organotin Compounds group, a total of three positive detections for Dimethyltin are recorded.

It is likely that one detection is from the incoming water, and is unlikely due to the chemical usage in production.

For the other two sites, chemical with Dimethyltin is likely used in production, as supported by the past sampling data. However, we have confirmed that this chemical is not used in our production line, and we will continue to request these sites to completely eliminate the use of Dimethyltin.

PFCs Group

For the PFCs group, a total of 15 positive detections are recorded, of which 14 are for PFOA, 1 for PFHxA. However, eight of the PFOA detections are due to incoming water with higher or similar PFOA concentration. These eight supplier facilities, all which are located in China. Since the detections of PFOA are due to background influence of the PFCs in the incoming water, these eight detections will not be counted as positive detection. However, we have confirmed that this chemical is not used in our production line, and we will continue to request these sites to completely eliminate the use of PFCs.

Phthalates Group

For the Phthalates group, a total of two positive detections for DEHP and one for DBP are recorded. For the two sites, chemicals with DEHP are likely used in production.

One positive detection of DBP is recorded for the “After Treatment” Wastewater sample. But no such chemical is detected in the “Before Treatment” raw wastewater.

Again, checking the past two sampling events in 2018 and early 2019, no positive detection of Phthalates chemicals was recorded for the site.

4.2.2 Heavy Metals

Heavy Metals (HM) results are evaluated against three standard levels, the foundational, progressive, and aspirational level. The results are presented in Figure 4-3 below and also summarized in Table 4-2 for an overview.

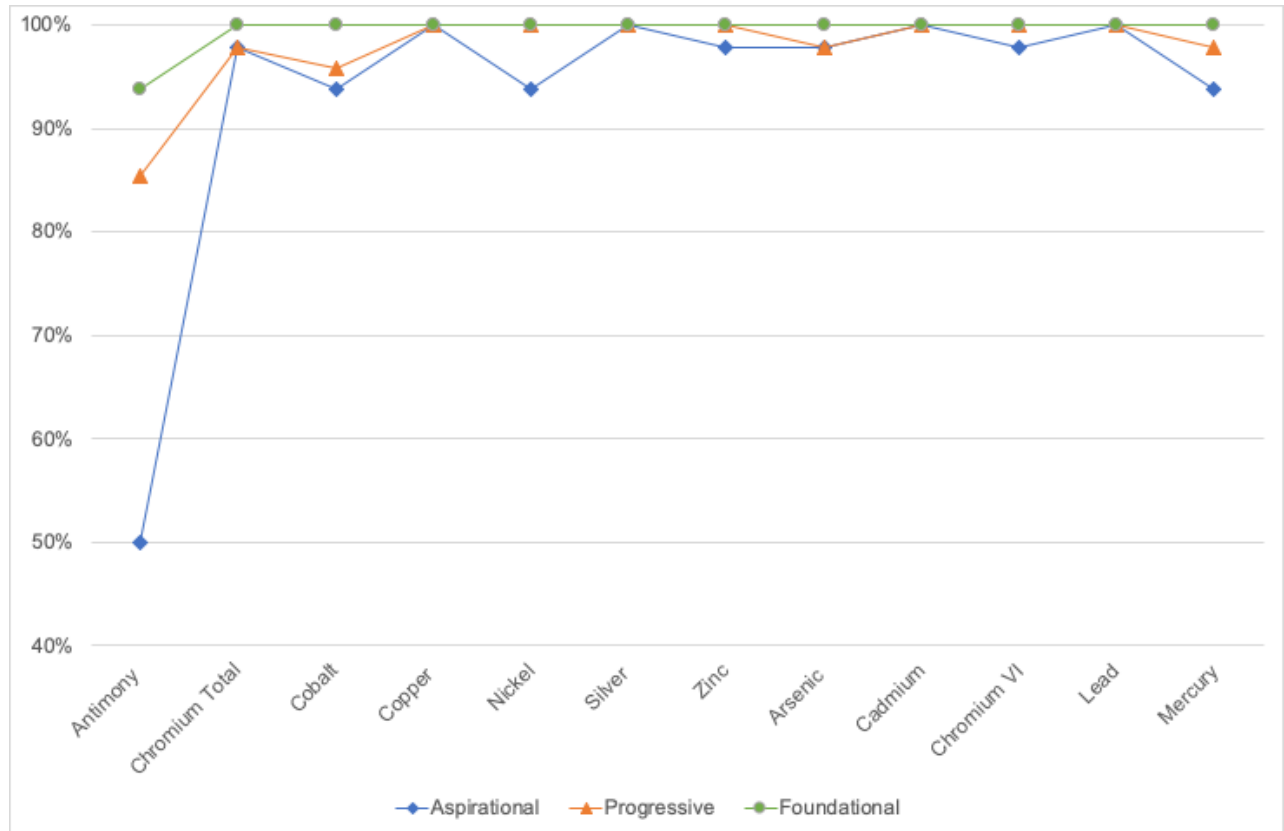


Figure 4-3 : % of achieving Aspirational, Progressive, and Foundational Level for Heavy Metals

Table 4-2: Overview of Heavy Metal compliance at the 3 levels

Level	Overall Compliance %	Heavy Metals above Reporting Limit	
Foundational	99.5%	1	Antimony
Progressive	97.9%	5	Antimony, Chromium, Cobalt, Arsenic, Mercury
Aspirational	93.6%	8	Antimony, Chromium, Cobalt, Nickel, Zinc, Arsenic, Chromium VI, Mercury

In general, all heavy metal parameters have a high compliance percentage with above 90% for all three levels, except for Antimony.

At foundational level, all 11 other heavy metals have achieved 100% compliance, except for Antimony (Sb). Three positive detections of Antimony above the foundational limit of 100 ug/L are recorded.

Antimony is used as a catalyst in the production of polyester, and there is no economic alternative available to replace this heavy metal. Input chemical control will not be effective in reducing antimony, as it is released from the polyester fabric during the de-sizing and dyeing processes.

The control of antimony is through effective wastewater treatment process, with careful control of pH and chemical addition.

4.3 APEOs Phase-out Status

Alkylphenol ethoxylates (APEOs) is a general chemical category which includes organic substances such as Nonylphenol ethoxylates (NPEOs) and Octylphenol ethoxylates (OPEOs). NPEOs are a group of closely related chemicals with a nine carbon-tail, versus OPEOs bearing an 8 carbon-tail. NP and OP are the breakdown chemicals of NPEOs and OPEOs correspondingly. APEOs used in a variety of industries mainly have a composition ratio of NPEOs and OPEOs around 4:1.

In the apparel industry, NPEOs are widely used during the manufacturing, which involves spinning lubricating, sizing, pretreatment, dyeing, printing, finishing and coating, as surfactants or emulsifiers for fibers, yarns and fabrics. NPEOs also exist in industrial laundry detergents. Wools and leathers suppliers need to be specifically targeted on, as NPEOs are typical scouring and dyeing dispersing agents for such materials. Equipment cleaners might also contain NPEOs and introduce the contamination during the cleaning process.

NP gets released into the factory production system through thermal decomposition from plastic/rubber materials which have intentionally added NP-based antioxidants. Suppliers are especially vulnerable to NP contamination, which involves plastic/rubber materials during the manufacturing process, such as for accessories like bags and belts. NPEOs can also degrade into NP.

Since the commitment to phase-out APEOs in 2013, FR has made several initiatives to understand and set requirement to eliminate APEOs usage at its supplier facilities. One of the initiative was to work with the supplier facilities and partners to identify substitute chemicals in formulations that can deliver the same or comparable processing properties.

The APEOs detection in the wastewater samples have improved since 98.6/98.4% in 2013/2014 to 100% compliance on zero discharge in 2019.

4.4 PFCs Phase-out Status

FR also made the commitment to phase out use of PFCs in 2013. Since then, FR has made gradual improvement on eliminating PFCs in the manufacturing processes. A case study was made with partner suppliers to investigate the water resistance results with PFC-free alternative treatment, against short-chain C6 PFCs. As a result, PFCs use was reduced to approximately 2% of products sold in 2016 and eliminated for FR products in fall/winter 2017.

5 Development Beyond 2020

5.1 Input Chemical Management

FR plans to focus more on chemical input management and set clear requirements on safety and transparency for FR supplier facilities. As seen from the results comparison shown in Table 5-1 below, not all hazardous chemical groups in the raw wastewater (i.e., before treatment) are eliminated. In theory, the before treatment hazardous chemical concentrations should also be meeting 100% compliance on zero discharge should the chemical formulations are in compliance with FR MRS� and/or ZDHC MRS�.

Table 5-1: Comparison of compliance on zero discharge for raw and treated wastewater

Chemical Groups	Before Treatment	After Treatment
AP and APEOs	98.7%	100%
Chlorobenzenes & Chlorotoluenes	99.9%	99.9%
Chlorophenols	99.8%	100%
Azo Dyes	99.9%	100%
Carcinogenic Dyes	100%	100%
Disperse Dyes	100%	100%
Flame Retardants	99.9%	100%
Glycols	99.8%	100%
Halogenated Solvents	99.1%	99.5%
Organotin Compounds*	99.8%	99.6%
PFCs	97.0%	97.6%
Phthalates	99.6%	99.7%
PAHs	99.8%	100%
VOCs	99.6%	100%

*The figure of "After Treatment" is lower than that of "Before Treatment" likely due to the sampling/analysis error.

5.2 Supplier Facility Technical Support

Technical supports will be continuously provided to supplier facilities that have gaps against achieving 100% compliance. While FR team will be on-site to verify potential root causes on non-compliance, technical support and on-site coaching will be provided to the suppliers during the site discussion.

This activity has been a positive engagement for the supplier facilities. The lessons learned from the on-site assessment will be integrated into Best Practices Guide for Chemical Management and will be shared with other facilities.

5.3 Expanding the Program to include more Supplier Facilities

The Program will be expanded to include garment suppliers with wet processing facility in 2020 and beyond, making the total supplier facilities to be close to 90. Learning from the 2019 assessment can be readily applied to the expanded program.