2018

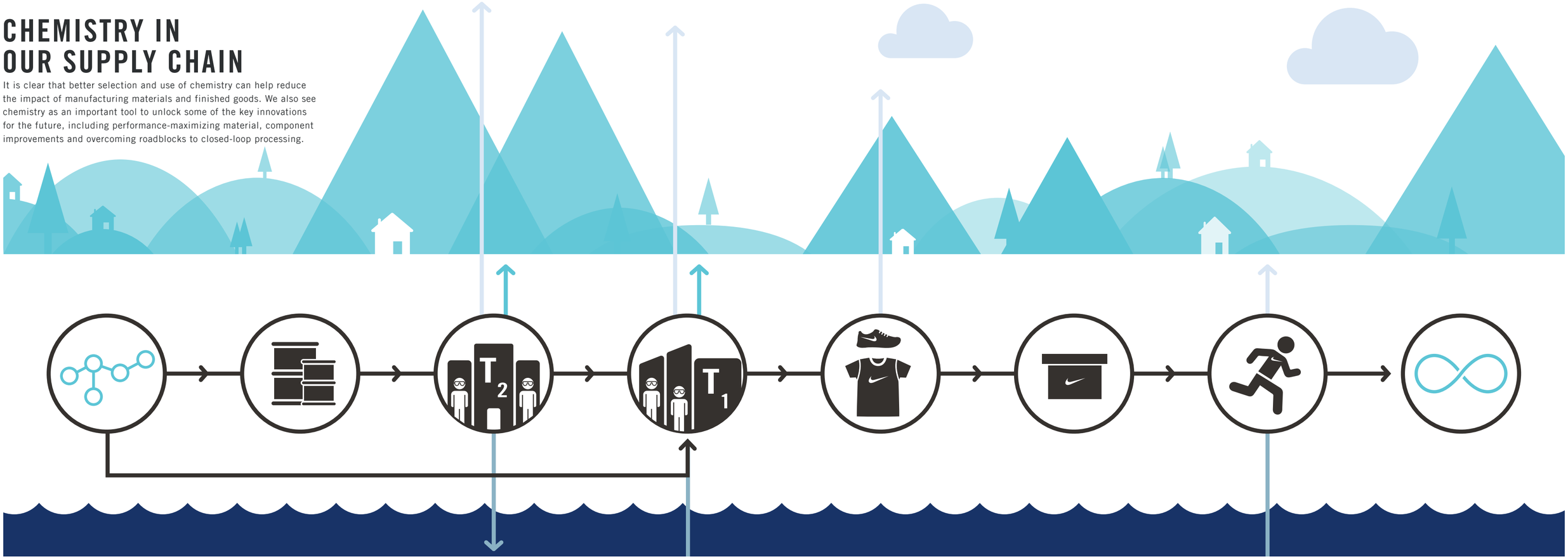
CHEMISTRY PLAYBOOK

RESTRICTED SUBSTANCES LIST

NIKE SUSTAINABLE BUSINESS & INNOVATION

CHEMISTRY IN OUR SUPPLY CHAIN

It is clear that better selection and use of chemistry can help reduce the impact of manufacturing materials and finished goods. We also see chemistry as an important tool to unlock some of the key innovations for the future, including performance-maximizing material, component improvements and overcoming roadblocks to closed-loop processing.



INTRODUCTION LETTER FROM OUR LEADER NIKE'S SUPPLY CHAIN MOONSHOT AMBITION CHEMISTRY MANAGEMENT COMPLIANCE RSL MATERIALS, GUIDELINES, & FORMS CONTACTS

OUR MOONSHOT AMBITION

DOUBLE THE BUSINESS HALF THE IMPACT

"OUR MOONSHOT CHALLENGE IS A BOLD AMBITION THAT'S GOING TO TAKE INNOVATION ON A SCALE WE'VE NEVER SEEN BEFORE."

HANNAH JONES, NIKE'S CHIEF SUSTAINABILITY OFFICER

Over the past several years, Nike has been implementing a single operational strategy for chemistry across the business. Through this work we continue to drive the use of better chemistries to create superior products.

This is accomplished by strengthening our compliance efforts to further protect market access, driving the adoption of better chemistries through chemical assessments and other tools, and implementing performance-enhancing innovations.

OUR COMMITMENT

At Nike, we've set a vision for a low-carbon, closed-loop future as part of our overall growth strategy. As part of this commitment, in 2016 Nike publicly announced a moonshot challenge to double the business while cutting our environmental impact in half. Reducing carbon emissions, reducing water consumption and reducing the use of controversial chemicals are all included in this ambitious challenge. The moonshoot challenge is incredibly **grand**. Reaching these goals will require unprecedented levels of innovation and collaboration – especially in chemistry.

OUR APPROACH

This moonshot ambition for chemistry translates into focusing efforts on reduction of controversial chemistries used in our raw material suppliers and finished goods factories.

Controversial chemicals are defined as chemicals ranked toxicologically as hazard category 1 (or Green Screen® Benchmark 1), high skin sensitization potential or based on internally defined Nike priorities.By our estimates, over 3000 unique chemicals are used in the apparel and footwear supply chain. Of those, Nike has identified which ones could be considered controversial chemicals, but in many cases toxicological data is missing to verify this number. Based on the criteria for controversial chemical there is ample opportunity for decreasing our use of these chemicals. Based on their use profile, Nike has prioritized a handful of these chemicals to phase-out.

When the current pipeline of projects at Nike are fully scaled, we estimate these prioritized chemicals will equate to a 25% reduction in controversial chemical use.

The remaining 25% reduction of Hazard Class 1 controversial chemicals needed to achieve the moonshot will require increasingly accurate data to support data driven solutions, strong industry partnerships and industry-advancing innovations.

This translates into 4 key areas in need of advancement:

1. Substantially reduce the number of chemistries with gaps in toxicology data to enable better decision making
2. Increase the use of lower hazard chemicals across the industry
3. Proceed only with substitutions that have credible information – no regrettable substitutions
4. Prevent the inflow of new controversial chemicals by using a well-defined chemical assessment process.

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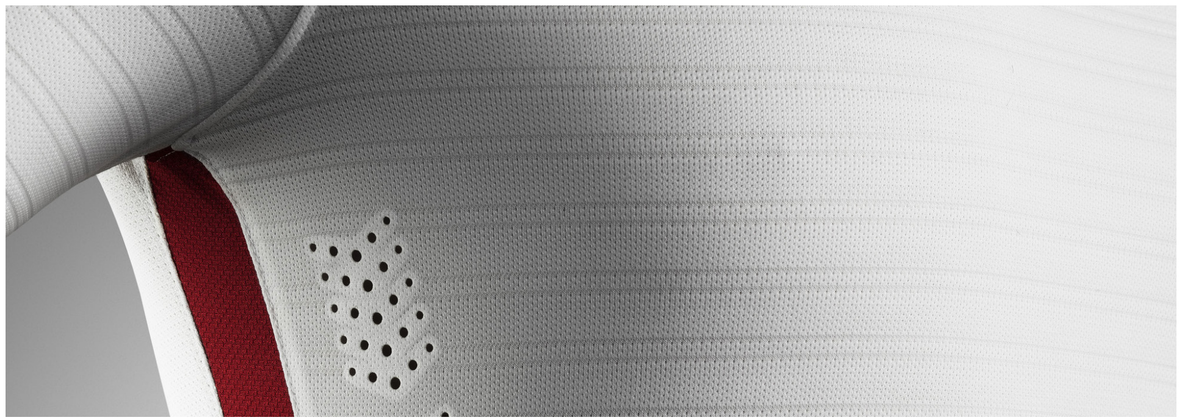
ODOR MANAGEMENT

At Nike, serving the athlete and creating the future of sport drives us to innovate and overcome challenges. It is within our culture to find creative and effective solutions to common problems, and to apply our technical knowledge in ways that advance the performance of our materials and products. Importantly, sustainability is embedded within our approach to innovation.

Innovation teams at Nike looked at the problem from a different perspective, focusing on the odor molecules instead of the microbes producing the odor molecules. Through this innovation, the Nike team was able to eliminate. The Nike Innovation team was able to eliminate the use of controversial chemicals and produce a finish to reduce odors without the potential challenges of using antimicrobial technologies.

This approach keeps potentially harmful antimicrobials out of the supply chain and wastewater, and reduces potential impacts across the environment.



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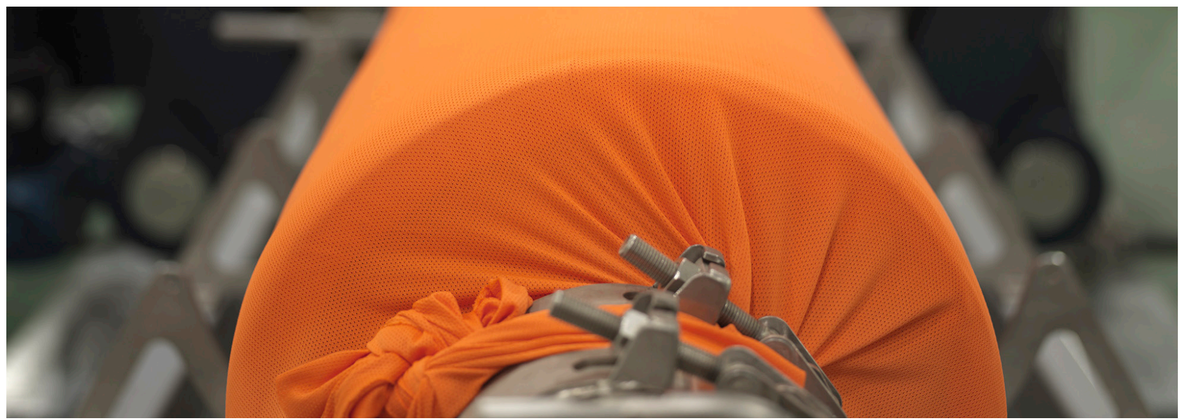
WATERLESS DYEING

Conventional textile dyeing requires substantial amounts of water. On average, an estimated 100-150 liters of water is needed to process one kg of textile material. Industry analysts estimate that more than 39 million tons of polyester was dyed annually in 2015. Nike has invested in better approaches to manufacturing materials which result in a both less water consumption and less chemistry use. Waterless dyeing is one such approach, where we have achieved intense coloration that requires less chemistry and minimizes water consumption in one process.

Minimizing the water consumption reduces additional chemicals required to treat wastewater streams, as well as reducing the energy needed to heat the large volumes of water for a traditional dyeing process. Improving the chemical efficiency throughout production reduces the total amount of chemistry required for achieving specific material goals.



WE SEE CHALLENGES AS OPPORTUNITIES TO INNOVATE, CREATE & MOVE TOWARDS A BETTER FUTURE.

- Phasing out hazardous chemistries for less hazardous alternatives
- Development of a new material with lower hazard profile
- Reduction in use of solvents

EXPECTATIONS

All Nike vendors are strongly encouraged to participate in this program and should complete and submit the vGE form on page 103 to begin the review process.

CHEMICAL ASSESSMENTS (COE)

In an effort to reduce new controversial chemicals from entering our supply chain, Nike has further implemented our chemical evaluation process to help innovation teams understand chemicals being reviewed for used in new products. Nike works with third party toxicology teams to assess the chemicals used in the manufacturing of our products.

Using an approach such as the Green Screen® methodology or similar approach, the chemicals are ranked and compared to benchmark values as a go/no-go step, helping to reduce the use of and prevent introduction of highly hazardous chemicals. When a chemical is flagged during the evaluation process, the Nike Chemistry Center of Excellence works directly with innovation teams and chemical manufacturers to replace the flagged chemical with a safer alternative, which also must be vetted using the assessment approach. To request a chemical assessment on a new formulation or chemistry, please refer to your Nike contact and they will connect you with the Nike Chemistry Center of Excellence.

REDUCING HC1 CHEMISTRIES

In addition to the review of new and innovative chemistries mentioned above, Nike applies the same approach in our efforts to reduce the number of Benchmark 1 chemicals already being used in manufacturing.

Hazard Category 1 (similar to Benchmark 1 rated chemicals per the Green Screen® methodology) are widely accepted as chemicals that should be phased out of use due to an associated chemical hazard, backed by scientific data and toxicological profiling. During Nike's ongoing review of the chemicals used in our supply chain, we're always striving to reduce the use of any identified Hazard Category 1 chemicals when alternatives are present. When alternatives aren't currently available or are not available at scale, we work with global teams to help find solutions.

The reduction of Hazard Category 1 chemicals across our supply chain is a key contributor to reducing the use of our controversial chemicals by 50%. Scrutinizing our chemical use and improving efficiencies associated with chemical usage is a key priority for the Nike Chemistry Strategy.

CHEMICAL ASSESSMENTS

When bringing new materials, new manufacturing processes, or new chemistry into the supply chain – or onto Nike products – a chemical assessment must be requested. This is also a mandatory step when requesting vGE points for chemistry changes.

From a material perspective, this refers to any material where the chemical make-up, either used in manufacturing or will be present on a finished product, is different than the material it's replacing in the supply chain.

For example, when a material is constructed from the same yarns and knitting machines, and uses a different construction, no chemical evaluation is needed. Whereas, a new novel chemical recycled polyester must go through the chemical assessment process to ensure we're not unintentionally introducing controversial chemicals into the supply chain.

CHEMICAL ASSESSMENT OR EVALUATION

A chemical assessment or evaluation can be requested by a supplier, Nike internal team or affiliate, and is performed in one of two ways:

METHOD 1 (PREFERRED)

Under the protection of a Non-Disclosure Agreement, the submitter provides all CAS #'s and concentrations to the Chemistry Center of Excellence (COE) so they may perform the chemical assessment; which includes a toxicology review and legislative/regulatory sweep to ensure there aren't any market access concerns with selling or producing the product/material.

Once the Chemistry COE receives the information, a meeting is set-up between Nike's Chemistry COE and the submitter to review results and discuss in detail any identified "red flags," followed by next steps.

METHOD 2

The chemical supplier or innovator works directly with one of our third-party toxicology assessors who supplies us with a redacted report with a toxicology profile showing if a chemical is on specific lists that Nike monitors. If any chemicals show up, we work directly with the submitter to get additional information.

WHY WE DO IT

Performing these chemical assessments early in the innovation cycle helps us identify chemicals of concern and work with our supply chain and internal partners to replace Hazard Category 1 or high dermal sensitizer chemicals with better chemistry choices and alternatives.

CONTACT

For more information, contact Kate Horspool in in the Chemistry Center of Excellence:

kate.horspool@nike.com

RSL CONTINUED

CAS NO.	SUBSTANCE	NIKE LIMITS Maximum Allowable Concentration in Component	LABORATORY LIMITS Reporting Limit (For Lab Use)	POTENTIAL USES Textile Processing for Apparel & Footwear	SUITABLE TEST METHOD Sample Preparation & Measurement
	Azo-amines				
92-67-1	4-Aminobiphenyl	20 ppm each	5 ppm per listed amine in product	Azo dyes and pigments are colorants that incorporate one or several azo groups (-N=N-) bound with aromatic compounds. Thousands of azo dyes exist, but only those which degrade to form the listed cleavable amines are restricted. Azo dyes that release these amines are regulated and should no longer be used for dyeing of textiles.	Textile: EN ISO 14362-1:2017 Leather: EN ISO 17234-1:2015 p-Aminoazobenzene: Textile: EN ISO 14362-3:2017 Leather: EN ISO 17234-2:2011
92-87-5	Benzidine				
95-69-2	4-Chlor-o-toluidine				
91-59-8	2-Naphthylamine				
97-56-3	o-Aminoazotoluene				
99-55-8	2-Amino-4-nitrotoluene				
106-47-8	p-Chloraniline				
615-05-4	2,4-Diaminoanisole				
101-77-9	4,4'-Diaminodiphenylmethane				
91-94-1	3,3'-Dichlorobenzidine				
119-90-4	3,3'-Dimethoxybenzidine				
119-93-7	3,3'-Dimethylbenzidine				
838-88-0	3,3'-dimethyl-4,4'-diaminodiphenylmethane				
120-71-8	p-Cresidine				
101-14-4	4,4'-Methylen-bis(2-chloraniline)				
101-80-4	4,4'-Oxydianiline				
139-65-1	4,4'-Thiodianiline				
95-53-4	o-Toluidine				
95-80-7	2,4-Toluylendiamine				
137-17-7	2,4,5-Trimethylaniline				
95-68-1	2,4 Xylidine				
87-62-7	2,6 Xylidine				
90-04-0	2-Methoxyaniline (= o-Anisidine)				
60-09-3	p-Aminoazobenzene				
106-49-0	p-Toluidine	Additional screening tests for all Nike products. For information only.			
108-44-1	m-Toluidine				

RSL CONTINUED

CAS NO.	SUBSTANCE	NIKE LIMITS Maximum Allowable Concentration in Component	LABORATORY LIMITS Reporting Limit (For Lab Use)	POTENTIAL USES Textile Processing for Apparel & Footwear	SUITABLE TEST METHOD Sample Preparation & Measurement
	Bisphenol-A				
80-05-7	Bisphenol-A (BPA) Testing required for food-contact items including water bottles and mouth guards.	1 ppm Banned from use as a monomer in the production of items that come into contact with food.	1 ppm	Used in the production of epoxy resins, polycarbonate plastics, flame retardants and PVC. Prohibited from use in food and drink containers, and items intended to come into contact with the oral cavity.	Sample preparation: Extraction: 1g sample/20mL methanol, sonication for 60 minutes at 70°C Measurement: DIN EN ISO 18857-2 (mod)
	Chlorinated Paraffin				
85535-84-8	Short-chain chlorinated Paraffins (SCCP) (C10-C13)	1,000 ppm	100 ppm	May be used as flame retardants or as fat liquoring agents in leather production. They also can be used as plasticizers.	Combined CADS / ISO 18219:2015 method V1:06/17 (extraction by ISO 18219 and analysis by GC-NCI-MS)
85535-84-9	Medium-chain chlorinated Paraffins (MCCP) (C14-C17)	1,000 ppm	100 ppm		
	Chlorophenols				
15950-66-0	2,3,4-Trichlorophenol	0.5 ppm each	0.5 ppm each	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and tetrachlorophenol (TeCP) are sometimes used to prevent mold and kill insects when growing cotton and when storing/ transporting fabrics. PCP and TeCP can also be used as preservatives in print pastes.	1M KOH extraction, 12-15 hours at 90° C, derivatized and analysis § 64 LFGB B 82.02-08 or DIN EN ISO 17070:2015
933-78-8	2,3,5-Trichlorophenol				
933-75-5	2,3,6-Trichlorophenol				
95-95-4	2,4,5-Trichlorophenol				
88-06-2	2,4,6-Trichlorophenol				
609-19-8	3,4,5-Trichlorophenol				
4901-51-3	2,3,4,5-Tetrachlorophenol (TeCP)				
58-90-2	2,3,4,6-Tetrachlorophenol (TeCP)				
935-95-5	2,3,5,6-Tetrachlorophenol (TeCP)				
87-86-5	Pentachlorophenol (PCP)				

3 ITEMS NOT LISTED AS CORE OR SUPPLEMENTAL:

A substance restricted by legislation or Nike requirements, and either

A) Has been phased out successfully over time

OR

B) Has not been identified as chemistry in use for the specified material.

Suppliers must still meet the specified limits for these substances, but they are very unlikely to be found when normal production practices are followed for specified materials.

The testing implementation program outlined herein is the minimum required testing. Suppliers are strongly encouraged to perform additional testing of materials against the Nike RSL limits and against related lists such as the REACH SVHC list or California Proposition 65 list.

Regardless if testing is listed as Core, Supplemental, or Not Listed in the implementation guidance, all materials, items and finished goods must meet the requirements in the RSL.

MATERIALS TESTING MATRIX

RESTRICTED SUBSTANCE	NATURAL FIBERS	SYNTHETIC FIBERS Nylon, PET	NATURAL & SYNTHETIC FIBER BLENDS	SYNTHETIC LEATHER, THERMOPLASTICS, POLYMERS EVA, PU, RIGID PLASTIC, TPU, FOAM, RUBBER	NATURAL LEATHER	COATED LEATHER	INKS, PAINTS, HEAT TRANSFERS Screen Print Inks	ADHESIVES	SCREENPRINT STRIKE-OFFS	SUBLIMATION PRINTS, DIGITAL PRINTS	METAL ITEMS	OTHER Rhinestones, sequins, etc.
Acetophenone and 2-Phenyl-2-Propanol				S-5								
Alkylphenol Ethoxylates (NPEO, OPEO)	C	C	C	C	C	C	C	C	C	C		
Alkylphenols (NP, OP)	S	S	S	S	S	S	S	S	S	S		
Asbestos	S	S	S									
Azo-amines	C-8	S	C-8	S	C-8	C-8	C-1, C-8			C-8		
Bisphenol-A				S-6								
Chlorinated Paraffin					S	S						
Chlorophenols	S		S		S	S						
Chlororganic Carriers		S	S									
Dimethylformamide				C								
Dimethylfumarate					S	S						
Dioxins and Furans	Prohibited											
Dyes (Acid, Basic, Direct, Other)	S	S	S	S	S					S		
Dyes (Disperse)		C-8	C-8	S	S					C-8		

INKS, PAINTS & ADHESIVES

PREPARING BASE COLOR SAMPLES FOR SUBMISSION TO LABORATORIES

The loading of the pigment in the base must be at 15%, regardless of the amount used in production. Only one pigment may be added. Any additives used in the application must also be added prior to the curing process.

Ready-to-use (TRU) ink products must be submitted as-is, with no changes to the formulation. All products must be cured and dried in a manner consistent with the ink manufacturer's recommendations or the actual conditions used in production.

It is not acceptable to submit a composite ink sample (more than one pigment in a basec olor sample).

Nike considers inks, paints and adhesives to be high risk for RSL non-compliance. These materials MUST be tested prior to production in an "as applied" state; for example, ink that has cured, paint that has dried, etc.

All inks, paints and adhesives must be tested annually and receive an RSL PASS result prior to application to any product, and must be retested every time a change is made to the color system formulation or on an annual basis, whichever comes first.

A COLOR SYSTEM

For Nike RSL purposes, a color system is defined as the set of base colors, pigments and all additives used to mix colors. (See Figure 4.) Once a color system is RSL-compliant – and received an RSL PASS – no substitutions can be made to any component without testing the new component.

For testing, all color system components must be in the "as-applied" state. This means that ink and paint systems must be cured and dried following routine practices as used in production before sending to labs for testing. Labs aren't allowed to perform drying and curing steps.

- Material must be dried at the same rate and temperature as will be used for the final product
- Material should be applied on a surface that allows material to be scraped or peeled off: a glass plate or foils are preferable. Refer to the sidebar on this page for specific guidance on preparing color system samples for submission to laboratories.
- Strike-off testing is also required, as covered in the next section

SCREEN PRINT INKS, HEAT TRANSFERS & SIMILAR EMBELLISHMENTS

Nike considers screen print inks, heat transfers and similar embellishments to be at high risk for RSL non-compliance. They must be tested annually and receive an RSL PASS result prior to application to any product. They must be retested every time a change is made to the color system formulation or on an annual basis, whichever comes first.

STRIKE-OFF TESTING

For screen prints, heat transfers and similar embellishments, the factory must test strike-offs at a rate of 2% by style (not color). Selected samples should be dark-colored or fluorescent prints.

EXAMPLE: A factory makes 100 different styles. The factory must test 2% of styles produced (100 styles x 2% = 2 strike-off tests). The two styles with the highest production volume are chosen for testing. If greater than 50 styles are produced, a minimum of one strike-off test is required. (See Figure 5, on the next page, for guidance.)

Figure 4.

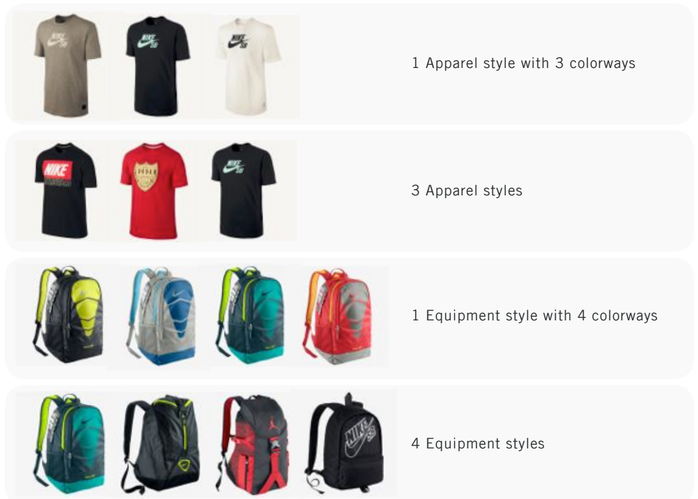
REQUIRED COLOR SAMPLE TESTING FOR ALL INKS, PAINTS AND PIGMENTS

- Composite ink testing is not allowed
- ALL base color samples must undergo annual testing
- Each complete base color sample – including bases, pigments and additives – must undergo initial testing before use in any Nike product and receive an RSL PASS
- Shades or color combinations do not need to be retested once all base color samples in use have received an RSL PASS (within one year)
- Base color sample must be retested whenever a component – bases, pigments and additives – of the formula changes

Figure 5

REQUIRED STRIKE-OFF TESTING OF TOP 2% OF STYLES BY PRODUCTION VOLUME

DEFINITION OF STYLES



Choose the top 2% of styles by production volume for strike-off testing, rotating colorways. Style numbers should not include the color code.

TOP 2% OF STYLES BY PRODUCTION VOLUME

STYLES	PRODUCTION VOLUME	STRIKE-OFF TEST REQUIRED FOR THIS STYLE?
Style 1	50,000	Yes
Style 2	500	No
Style 3	20,000	No
Style 4	30,000	Yes
Style 5	40,000	Yes
Styles 6 – 148	400	No

In this example, a factory produces 148 styles:

148 styles x 2% = 2.96

Top 3 styles by production volume must undergo RSL testing

DIGITAL & SUBLIMATION PRINTS

Digital and sublimation prints must be tested once per year. The sample should be prepared by printing each color individually on an RSL-compliant fabric representative of production material. The samples must be applied with production transfer paper and on production equipment.

When submitting sublimation prints to the lab, print each base color independently on three A4-sized sheets of fabric.

Example: If four base colors are used for sublimation printing, print twelve A4-sized sheets, three for each base color.

For digital prints, print at least 10 grams of ink for each base color. Print should be submitted for testing fully cured and dried on a glass slide (preferred) or on an RSL-compliant material.

DIMENSION WELDS

All dimension welds are considered high risk and require testing. No substitutions can be made unless the substitute is also compliant (proven by testing).

METAL PARTS

All metal items are considered high risk and each component must be tested annually or when a base metal is changed.

OTHER: RHINESTONES, SEQUINS, ETC.

These materials, due to the reliance on metal and plastic, are generally considered very high risk for RSL non-compliance. Each component must be tested annually or when a base metal is changed. Testing will vary based upon material type and use. Consult the testing lab or the Nike RSL team for guidance.

PROMOTIONAL GIVEAWAY ITEMS

All promotional giveaway items bearing a Nike or Affiliate brand logo must meet the requirements listed in the Nike RSL and may be subject to further requirements.

Promotional giveaway items should be tested according to the base material and intended use of the item. Many promotional giveaway items fall into the categories described within this document and should be tested accordingly. This includes items such as customized T-shirts (screenprint), toys, electronics and electrical equipment (EEE) such as luminescent armbands, and various objects (such as water bottles, bracelets, necklaces and dog tags) that come in direct contact with the skin or mouth (leather, plastics, rubber and metal).

If you have a promotional giveaway item that does not clearly fit into a category within the Nike RSL or need help getting the correct (local) requirements, please contact:

RSLSupport@nike.com

lst-product.safety.global@nike.com

for assistance with the verification process.

In addition to RSL testing, promotional giveaway items require evaluation for general legal compliance. To obtain this evaluation, please contact:

lst-product.safety.global@nike.com

TOYS, ELECTRONIC & ELECTRICAL EQUIPMENT, & FOOD CONTACT MATERIALS

The testing requirements for toys, electronic and electrical equipment and food contact materials differ from the testing requirements of general Nike Apparel, Footwear and Equipment products. Please refer to the specific RSL lists on the following pages. Because these products may also require technical files or additional labeling, please consult your Nike RSL contact when developing a product that has the characteristics of a toy, electronic or food contact material.

TEST ADMINISTRATION

The testing specified above applies to both new and existing materials. All testing must be performed on production-ready material – material identical to that used in actual product. During the time period in which materials or products are undergoing RSL testing, they can't be shipped or used in production until Nike receives a passing RSL report.

If a material fails RSL testing, all materials affected by that failure must be immediately quarantined until product disposition occurs and the failure resolution process is completed with Nike. Only materials that pass both Adult and Kid (Infant / Toddler, Little Kids and Big Kids) RSL testing requirements can be used for products intended for children, including any "take down" product.

Prior to production, suppliers must provide factories with test results proving compliance with the Nike RSL. All testing must be performed at a Nike-approved lab. All samples sent to the lab must be accompanied by a Test Request Form (TRF), available at www.nikeincchemistry.com. Test results will be valid for one year from the RSL test report date unless otherwise stated. Nike reserves the right to request testing documentation at any time for any material.

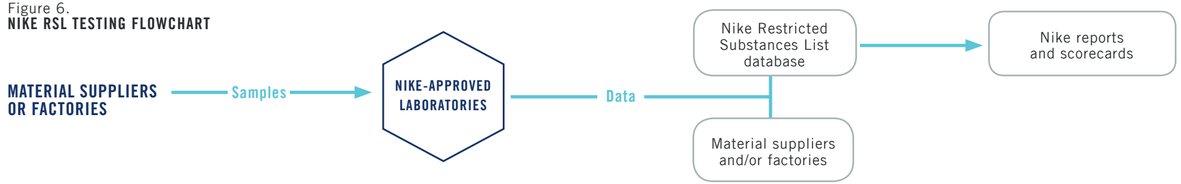
HANDLING RSL DATA

As shown in Figure 6, Nike-approved labs will conduct the tests and send all results to Nike for inclusion in the online RSL database.

The Nike RSL database will store data and create test reports that the lab will distribute to the supplier.

Nike will use the database to generate supplier scorecards and other evaluation reports.

Figure 6.
NIKE RSL TESTING FLOWCHART



FY17 CHEMISTRY PLAYBOOK