LI NING COMPANY LIMITED
李宁有限公司

Li-Ning ESG
Chemical Safety Guide
– Identification and Protection of Heavy Metals

During the production process of textiles, the use of chemicals can impart various functions and properties to textiles, such as softness, wrinkle resistance and water resistance. However, it may also pose potential risks to environmental safety and human health. Therefore, proper chemical management and usage are of crucial importance.

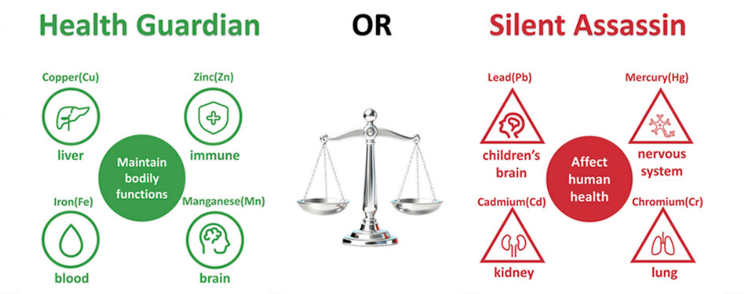
As a responsible company, Li Ning Group is committed to sharing chemical knowledge with consumers, enhancing the public's awareness and ability to identify potential risks of chemicals, and jointly taking effective protective measures with consumers to safeguard the safety of textiles.

Clothing, serves as the "second skin" of the human body, not only carrying the external value of expressing fashion and personality but also undertaking the internal protective function of blocking external stimuli, regulating body surface temperature, and maintaining a healthy and comfortable micro-environment. Imagine that when you wear your favorite sports clothes and sweat profusely on the sports field, or feel the gentle wrapping of the close-fitting clothes around your skin, you may not have realized that the sudden occurrence of skin redness, itching, and even rashes might be caused by the excessive heavy metal residues in the clothing. Raw material pollution or improper dyeing and printing processes can lead to heavy metal residues, which are absorbed by the human body through long-term contact, and pose potential threats to health. In this edition of chemical knowledge sharing, let's talk about how heavy metals sneak into textiles.

Heavy Metals:

The Guardian of Human Health or the Silent Assassin?

In chemistry, heavy metals, generally refer to metals with a density greater than 4.5 g/cm^3, include about 40 types, such as gold, silver, copper, lead, zinc, nickel, cobalt, chromium, mercury, and cadmium, etc. Among them, some heavy metals, such as zinc, iron and manganese, etc., are essential trace elements for maintaining bodily functions; however, the others—such as lead, mercury, cadmium and chromium, etc., if they enter the human body through the respiratory tract, digestive tract, or skin and accumulate to a certain amount, may cause damage to multiple systems such as digestion, urinary system, nervous system, and bones, and even produce genetic toxicity and reproductive toxicity.



Typically, the content of heavy metals in qualified textiles is effectively controlled, and consumers do not need to be overly anxious during normal use. However, given the long production chain, diverse production stages and complex processes of modern textiles, understanding the sources of harmful heavy metals in textiles is an important measure for consumers to make better choices and pursue a higher quality of life. The heavy metals commonly found in textiles include more than 10 types, such as lead, mercury, arsenic (a metalloid), cadmium, chromium, copper, nickel, cobalt and antimony, etc. They can end up in the final products through the following stages:

Raw Material Contamination:

Natural fibers like cotton and linen may absorb heavy metals such as lead, cadmium and mercury from the soil or air during their growth, which accumulate in the fibers and lead to heavy metal residues in the final textiles.

Chemical Fiber Synthesis:

The synthesis of chemical fibers often relies on metal-containing auxiliaries. For example, antimony trioxide is commonly used as a polycondensation catalyst in the production of polyester fibers (also known as "polyester"), leaving metal residues in the fibers.

Dyeing and Finishing:

The metal complex dyes used for coloring, as well as the functional finishing agents such as fixing agents and flame retardants, are also common sources for metals like chromium, cobalt, and copper to enter fabrics.

Hazards of Heavy Metals:

Dual Threats to Human Health and the Environment

For textiles that are in direct contact with the skin, heavy metals may be directly absorbed through the skin. Children, with their underdeveloped skin barriers and tendency to chew on objects, are more vulnerable. For instance, lead can cross the blood-brain barrier, disrupt nerve conduction and cause irreversible damage to children’s intellectual development. Cadmium accumulates in the body over time, leading to chronic kidney failure, osteoporosis, bone pain and stunted growth.

In addition, heavy metals also pose potential threats to the quality of textiles and the ecological environment. Excessive heavy metals such as iron and copper act as "destabilizing agents" within textiles. During processing, storage and usage, they continuously catalyze fiber degradation, impair the stability of dyes, and interfere with the effectiveness of chemicals. Eventually, this leads to reduced textile strength, shortened product lifespan, color distortion and deterioration in appearance. Moreover, if the printing and dyeing wastewater is discharged into water bodies without proper treatment, the residual heavy metals will enter aquatic organisms and drinking water through the water cycle, ultimately harming human health.

Heavy Metal-Related Regulations:

A Global Collaborative Effort to Enhance Safety

To ensure the safety of textiles, global regulations on heavy metals in textiles are increasingly stringent. For instance, China’s national standards such as GB/T 35611—2024 (Green Product Assessment - Textile Products), GB/T 18885—2020

(Technical specifications of ecological textiles), the EU’s REACH Regulation, the U.S. CPSIA (Consumer Product Safety Improvement Act), and the globally recognized ecological textile certification OEKO-TEX® STANDARD 100 all specify and limit heavy metal content. Prioritizing product quality and consumer health, Li Ning Group has included relevant requirements in the RSL (Safety technical requirements for Li Ning product), strictly restricting and minimizing the content of heavy metals in products to protect consumer health and environmental safety and driving green transformation across the value chain.

While strictly controlling product quality, Li Ning Group continues to invest in sustainable development and supply chain management, committed to reducing its environmental impact and working with partners in the brand’s value chain to fulfill social responsibilities. In December 2024, based on the output of years of supplier chemical assessment programs, Li Ning Group released the Chemical Management Framework, a systematic document aimed at strictly controlling the use, discharge and impact of chemicals in the supply chain across "input-process-output" dimensions, and adopting a tiered assessment and evaluation system to promote the implementation of the Chemical Management Framework among suppliers, thereby safeguarding consumer health and environmental safety from the source and driving the green transformation of the industry.

Li Ning Company Limited

LI NING COMPANY LIMITED
CHEMICAL MANAGEMENT FRAMEWORK

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To minimize the use of harmful substances in production, Li Ning Group continues to focus on cooperative research and development and application progress of eco-friendly dyes, auxiliaries and degradable materials, and has adopted a series of measures in production and processing enterprises to strictly prevent heavy metal pollution.

Heavy Metal Protection Strategies:

Recognizing Labels for Safer Textiles

How can consumers protect themselves against the threat of heavy metals in textiles? Develop the habit of "checking labels and washing first":

Check Labels:

When purchasing textiles, choose products from reputable channels with reliable brands. Examine ingredient lists and safety certification information on the label, prioritizing products with international or national standard certifications.

Wash Thoroughly:

Before using newly purchased textiles, wash them thoroughly with warm water and a small amount of detergent to help remove surface heavy metal residues. For intimate clothing and children’s products, wash repeatedly are particularly important.