Modular Container-type Hazardous Waste Storage Facility Complete Solution Technical White Paper

Standardized storage of hazardous waste is a core element of environmental compliance and safe production for industrial enterprises, as well as a critical line of defense for protecting ecologicalenvironmental safety and ensuring occupational health. With the comprehensive implementation of "Standard for Pollution Control on Hazardous Waste Storage" (GB18597-2023), traditional built-in hazardous waste storage facilities face challenges including long construction cycles, immobility, difficult renovation,high costs, and weak compliance adaptability, making it difficult to meet modern industrial enterprises' flexible deployment, rapid compliance, and on-demand expansion needs for hazardous waste storage.high costs, and weak compliance adaptability, making it difficult to meet modern industrial enterprises' flexible deployment, rapid compliance, and on-demand expansion needs for hazardous waste storage.on-demand expansion needs for hazardous waste storage.

Container-type hazardous waste storage facilities, as a new type of standardized, modular, movable, and integrated hazardous waste storage facility, use standard containers as the basic carrier, integrating core technologies such as seepage prevention and corrosion resistance, explosion prevention and fire protection, ventilation and purification, intelligent monitoring, and emergency response.Using standard containers as the basic carrier, integrating core technologies such as seepage prevention and corrosion resistance, explosion prevention and fire protection, ventilation and purification, intelligent monitoring, and emergency response. With outstanding advantages of rapid deployment, flexible expansion, safe and controllable, compliant standards, and cost optimization, it has become the preferred solution for hazardous waste storage in chemical, machinery manufacturing, electroplating, metallurgy, pharmaceutical, new energy, and environmental governance industries.With outstanding advantages of rapid deployment, flexible expansion, safe and controllable, compliant standards, and cost optimization, it has become the preferred solution.it has become the preferred solution for hazardous waste storage in chemical, machinery manufacturing, electroplating, metallurgy, pharmaceutical, new energy, and environmental governance industries.hazardous

waste storage in chemical, machinery manufacturing, electroplating, metallurgy, pharmaceutical, new energy, and environmental governance industries.

Based on deep experience in the environmental protection technology industry and the latest national and industry standards, this white paper systematically expounds the core technology, design specifications, equipment integration, construction deployment, safety control, compliant operation and maintenance, and typical applications of container-type hazardous waste storage facilities.Based on deep experience in the environmental protection technology industry and the latest national and industry standards, this white paper systematically expounds the core technology, design specifications, equipment integration, construction deployment, safety control, compliant operation and maintenance, and typical applications of container-type hazardous waste storage facilities, providing enterprises with a full-chain, actionable, and replicable integrated solution from design to engineering implementation to long-term operation and maintenance.providing enterprises with a full-chain, actionable, and replicable integrated solution from scheme design to engineering implementation to long-term operation and maintenance.This helps enterprises achieve compliant, safe, intelligent, and movable hazardous waste storage, effectively avoiding environmental supervision and safety accident risks, and practicing green development concepts.effectively avoiding environmental supervision and safety accident risks, and practicing green development concepts.

1. Core Positioning and Compliance Basis of the Solution

The container-type hazardous waste storage facility complete solution is fundamentally based on modular design concepts, using standardized containers as the main framework. Through professional renovation and equipment integration, it constructs an integrated hazardous waste storage system that is "fully enclosed, leak-proof, pollution-proof, risk-proof, movable, and scalable".Through professional renovation and equipment integration, it constructs an integrated hazardous waste storage system that is "fully enclosed, leak-proof, pollution-proof, risk-proof, movable, and scalable", covering the entire process of hazardous waste storage while balancing compliance, safety, and economy, adapting to the differentiated needs of various industrial enterprises regarding hazardous waste output, types, and site

conditions.covering the entire process of hazardous waste storage while balancing compliance, safety, and economy.adapting to the differentiated needs of various industrial enterprises regarding hazardous waste output, types, and site conditions.

The solution strictly follows relevant national and industry regulations and standards to ensure full-process compliance. Core compliance references include "Standard for Pollution Control on Hazardous Waste Storage" (GB18597-2023), "National Hazardous Waste List" (2021 Edition),"National Hazardous Waste List" (2021 Edition), "Integrated Emission Standard for Air Pollutants" (GB16297-1996), "Code for Fire Protection Design of Buildings" (GB50016-2014), "Code for Installation of Explosion-proof Electrical Equipment" (GB50257-2014), and detailed management requirements for hazardous waste storage facilities from local environmental protection and emergency management departments."Integrated Emission Standard for Air Pollutants" (GB16297-1996), "Code for Fire Protection Design of Buildings" (GB50016-2014).2014), "Code for Installation of Explosion-proof Electrical Equipment" (GB50257-2014).Code for Installation of Explosion-proof Electrical Equipment" (GB50257-2014), and detailed management requirements from local environmental protection and emergency management departments.

The solution's core compliance requirements are clear: the storage period is strictly controlled within 1 year, which can be extended with approval from environmental protection departments in special circumstances.

The extension period shall not exceed 6 months. Classified storage principles are strictly enforced, mixing incompatible hazardous wastes is strictly prohibited, and mixing hazardous waste with general solid waste and domestic garbage is strictly prohibited. Facilities must achieve full enclosure, seepage prevention, corrosion resistance, leak prevention, and rain penetration prevention.Facilities must achieve full enclosure, seepage prevention, corrosion resistance, leak prevention, and rain penetration prevention, equipped with complete ventilation and purification, gas monitoring, fire emergency, and video surveillance facilities. Standardized hazardous waste warning signs, classification signs, and responsibility publicity boards must be posted.equipped with complete ventilation and purification, gas monitoring, fire emergency, and video surveillance facilities.Standardized hazardous waste warning

signs, classification signs, and responsibility publicity boards must be posted. Complete hazardous waste inbound/outbound records and operation and maintenance records must be established to ensure traceability of every batch of hazardous waste, fully meeting environmental supervision requirements.to ensure traceability of every batch of hazardous waste, fully meeting environmental supervision requirements.

2. Complete Solution Technical System

The container-type hazardous waste storage facility complete solution constructs a full-process technical system of "modular design - core system integration - construction deployment - intelligent control - emergency response - compliant operation and maintenance", with all aspects working together to ensure safe, stable, and compliant operation of the facility.The container-type hazardous waste storage facility complete solution constructs a full-process technical system of "modular design - core system integration - construction deployment - intelligent control - emergency response - compliant operation and maintenance", with all aspects working together.with all aspects working together to ensure safe, stable, and compliant operation of the facility while balancing flexibility and economy, adapting to differentiated needs of different enterprises.

Modular design is the core advantage of the solution. Using standardized containers as the main framework, single, multiple, or combined container modes can be flexibly selected based on enterprise hazardous waste output.Single container specifications use industry standard dimensions, occupying 8-20 square meters, enabling rapid adaptation to different site conditions.enabling rapid adaptation to different site conditions. Whether for new plants, existing plant renovations, or temporary additional storage facilities, rapid deployment can be achieved without complex civil engineering work.Whether for new plants, existing plant renovations, or temporary additional storage facilities, rapid deployment can be achieved without complex civil engineering work. Design, renovation, installation, and debugging can be completed in 7-15 days for immediate use.Design, renovation, installation, and debugging can be completed in 7-15 days for immediate use. Meanwhile, modular design supports later expansion. New container modules can be added according to

changes in hazardous waste output.New container modules can be added according to changes in hazardous waste output without overall renovation, greatly reducing enterprise later upgrade costs.

Core system integration is the key to safety and compliance, covering six core modules: main structure renovation, seepage prevention and corrosion resistance system, explosion-proof and fire protection and anti-static system, ventilation and purification system, intelligent monitoring and early warning system, and supporting auxiliary systems.Core system integration is the key to safety and compliance, covering six core modules: main structure renovation, seepage prevention and corrosion resistance system, explosion-proof and fire protection and anti-static system, ventilation and purification system, intelligent monitoring and early warning system, and supporting auxiliary systems. All modules are deeply integrated and work together to form a comprehensive safety protection and environmental governance system.All modules are deeply integrated and work together to form a comprehensive safety protection and environmental governance system.

Main structure renovation uses high-strength carbon steel or 304 stainless steel as the foundation, adopting a double-layer composite box structure.The outer plate uses corrosion-resistant and wear-resistant panels, the middle is filled with thermal insulation and fireproof layers, and the inner plate uses anti-corrosion materials, with integral welding forming. It offers advantages of impact resistance, corrosion resistance, high load-bearing capacity, and thermal insulation and fireproof properties, with fire resistance limit of not less than 2 hours.with fire resistance limit of not less than 2 hours.The door uses explosion-proof sealed design, equipped with double-person double-lock, observation window, and high-temperature resistant sealing strips, achieving full enclosure protection to prevent exhaust gas leakage and unauthorized entry.The door uses explosion-proof sealed design, equipped with double-person double-lock, observation window, and high-temperature resistant sealing strips, achieving full enclosure protection to prevent exhaust gas leakage and unauthorized entry. The box bottom can be equipped with steel base or adjustable legs, without need for complex civil engineering foundation, directly placed on hardened ground.without need for complex civil engineering foundation, directly placed on hardened ground, greatly reducing construction difficulty and costs.

The seepage prevention and corrosion resistance system is the core for preventing soil and groundwater pollution, adopting a multi-layer composite structure of "base layer - seepage prevention layer - corrosion prevention layer - protection layer", fully covering key areas such as box floor, walls, and corners.The base layer uses high-strength steel plate reinforcement treatment to ensure flatness and firmness. The seepage prevention layer uses high-density polyethylene (HDPE) geomembrane or epoxy resin coating with thickness of not less than 2mm.The seepage prevention layer uses high-density polyethylene (HDPE) geomembrane or epoxy resin coating with thickness of not less than 2mm.The seepage prevention layer uses high-density polyethylene (HDPE) geomembrane or epoxy resin coating with thickness of not less than 2mm. The permeability coefficient meets GB18597-2023 standard requirements, ensuring no damage or joint gaps during laying.

After laying is complete, pressure testing is conducted to ensure seepage prevention performance meets standards.The corrosion prevention layer is precisely selected according to hazardous waste types. Acid and alkali-resistant coatings are selected for acidic and alkaline hazardous waste, while organic solvent-resistant materials are selected for organic hazardous waste to prevent secondary pollution caused by hazardous waste leakage corroding the box.to prevent secondary pollution caused by hazardous waste leakage corroding the box.The protection layer uses wear-resistant epoxy floor with anti-slip treatment for easy daily cleaning and maintenance. At the same time, a circular drainage channel and leakage collection tank are set up inside the box with volume of not less than 1/5 of the maximum hazardous waste container storage capacity.with volume of not less than 1/5 of the maximum hazardous waste container storage capacity. Door thresholds are raised not less than 150mm to prevent liquid hazardous waste overflow.to prevent liquid hazardous waste overflow. Liquid hazardous waste storage areas are additionally equipped with specialized anti-leakage pallets for dual prevention of leakage risks.

The explosion-proof, fire-proof, and anti-static system focuses on intrinsic safety, comprehensively preventing fire and explosion risks.The top of the box is provided with a pressure relief opening with area of not less than 5% of the box volume, and explosion pressure is controlled within 0.02MPa to ensure rapid pressure relief during

explosions and reduce accident losses.to ensure rapid pressure relief during explosions and reduce accident losses. Open flames and spark sources are strictly prohibited inside the box. All electrical equipment uses explosion-proof design, including explosion-proof lighting, sockets, and switches, to avoid electrical sparks causing safety accidents.to avoid electrical sparks causing safety accidents.The fire prevention system is equipped with explosion-proof fire extinguishers and fire sandboxes, with optional automatic sprinkler systems. The box is filled with flame-retardant fireproof cotton to further improve fire prevention performance.The anti-static system uses conductive epoxy coating on the floor to ensure grounding resistance does not exceed 4 ohms, timely discharging static electricity to prevent static accumulation causing fires and explosions.preventing static accumulation causing fires and explosions.

The ventilation and purification system is used to exhaust toxic and harmful gases and odors volatilized inside the box, reduce gas concentration, and prevent personnel poisoning and explosion risks.Explosion-proof axial fans are used to achieve positive or negative pressure ventilation. Combined with upper-lower convection design, exhaust openings are set at the top of the box and supply openings at the bottom to ensure uniform exhaust of gases inside the box.to ensure uniform exhaust of gases inside the box. Ventilation volume is calculated based on box volume with air exchange rate of not less than 15 times per hour.with air exchange rate of not less than 15 times per hour.Exhaust openings integrate exhaust gas purification devices. According to hazardous waste types, activated carbon adsorption, photo-oxygen catalysis, or spray tower purification processes are selected to ensure exhaust gases are purified and discharged up to standard, meeting GB16297-1996 standard requirements and avoiding air pollution from direct exhaust emissions.meeting GB16297-1996 standard requirements and avoiding air pollution from direct exhaust emissions.

The intelligent monitoring and early warning system realizes real-time control of the hazardous waste storage process, improving the precision and efficiency of safety prevention and control.Equipped with combustible gas sensors and toxic gas sensors, it monitors methane, ethanol, and other combustible gases, as well as VOCs, hydrogen sulfide, ammonia, and other toxic and harmful gases inside the box in real time.in real

time. Detection accuracy is not less than 25% LEL. When concentration exceeds warning thresholds, automatic audio-visual alarms are triggered.When concentration exceeds warning thresholds, automatic audio-visual alarms are triggered, linked with the ventilation system to increase air volume, and warning information is pushed to managers' mobile phones to ensure timely response.managers' mobile phones to ensure timely response. At the same time, temperature and humidity sensors, smoke sensors, and leakage sensors are integrated to monitor box environment parameters and seepage prevention layer integrity in real time.in real time. 24-hour video surveillance system is equipped for remote monitoring and data networking, enabling real-time viewing of box operation status and hazardous waste storage conditions to prevent illegal operations and theft.to prevent illegal operations and theft.

Supporting auxiliary systems balance classified management, emergency response, and daily operation and maintenance, including classified storage facilities, emergency protective facilities, electrical systems, etc.Supporting auxiliary systems balance classified management, emergency response, and daily operation and maintenance, including classified storage facilities, emergency protective facilities, electrical systems, etc. Classified storage facilities use shelves, isolation barriers, and classification signs to store by hazardous waste category and hazard characteristics.

Each area is posted with clear classification signs indicating hazardous waste name, hazard characteristics, and storage period.Emergency protective facilities are equipped with leakage collection tools, adsorption materials, protective equipment, and emergency rescue equipment to ensure rapid response to sudden accidents such as hazardous waste leakage and fires.to ensure rapid response to sudden accidents such as hazardous waste leakage and fires. The electrical system uses independent grounding design and is equipped with emergency power supply to ensure core equipment such as monitoring and ventilation systems operate normally during power outages.during power outages.

3. Solution Construction Deployment and Acceptance Standards

Construction deployment of container-type hazardous waste storage facilities follows the principles of "standardization, normalization, and high efficiency" without

complex civil engineering work.Construction deployment of container-type hazardous waste storage facilities follows the principles of "standardization, normalization, and high efficiency" without complex civil engineering work. With short construction cycles and flexible deployment, the entire process controls construction quality to ensure facilities meet design requirements and compliance standards.to ensure facilities meet design requirements and compliance standards.

In the pre-construction preparation phase, professional teams conduct on-site surveys. Based on enterprise site conditions, hazardous waste output, and types, container specifications, quantity, and placement are determined to optimize design.Based on enterprise site conditions, hazardous waste output, and types, container specifications, quantity, and placement are determined to optimize design. Construction materials are strictly inspected to ensure main structural materials, seepage prevention and corrosion resistance materials, explosion-proof electrical equipment, and monitoring equipment comply with national standards and design requirements.comply with national standards and design requirements. Use of unqualified materials is strictly prohibited. Construction sites are cleaned, leveled, and drainage measures are taken to ensure site hardening meets standards, avoiding quality impacts from rainwater soaking and debris accumulation during construction.avoiding quality impacts from rainwater soaking and debris accumulation during construction.avoiding quality impacts from rainwater soaking and debris accumulation during construction.

During construction, key aspects such as main structure renovation, seepage prevention and corrosion resistance, and equipment integration are strictly controlled.Main structural welding must be firm and sealed without missing or false welds. After welding is complete, anti-corrosion and rust prevention treatment is applied. Seepage prevention layer laying strictly follows specifications to ensure flatness, no damage, and firm joints.firm joints. After laying is complete, pressure testing and leakage inspection are conducted before subsequent construction.before subsequent construction.Corrosion prevention coating must be uniform without missed coating or bubbles, with coating thickness meeting design requirements. After construction, curing and maintenance are performed. Explosion-proof electrical, ventilation and purification, and monitoring and early warning equipment are installed with accurate positioning,

standardized wiring, and good sealing to ensure stable operation.to ensure stable operation.Supporting auxiliary facilities are installed completely. Classification signs and warning signs are posted according to specifications. During construction, safety management is strengthened, safety warning signs are set up, and illegal operations are strictly prohibited to prevent construction safety accidents.

During acceptance, strict verification is conducted according to national standards and design requirements to ensure facilities are compliant, safe, and up to standard.During acceptance, strict verification is conducted according to national standards and design requirements to ensure facilities are compliant, safe, and up to standard. Acceptance covers main structure, seepage prevention and corrosion resistance performance, explosion-proof and fire-proof and anti-static systems, ventilation and purification systems, intelligent monitoring and early warning systems, and supporting auxiliary systems.and supporting auxiliary systems.Seepage prevention performance is inspected through pressure testing and leakage detection to ensure no leakage. Explosion-proof and fire-proof and anti-static systems are checked including explosion-proof electrical equipment, pressure relief openings, and grounding devices to ensure compliance with specifications.to ensure compliance with specifications.Ventilation and purification systems are tested for ventilation volume and exhaust concentration to ensure compliance. Intelligent monitoring and early warning systems are tested for sensor sensitivity, alarm functions, and linkage effects to ensure normal operation.to ensure normal operation.Supporting auxiliary systems are checked including classified storage facilities and emergency equipment to ensure completeness and applicability. At the same time, hazardous waste management systems, inbound/outbound records, and personnel training records are verified to ensure compliance.

After passing acceptance, an acceptance report is issued and the facility can be put into use. Facilities failing acceptance are subject to deadline rectification and re-acceptance after rectification is complete.

4. Full-Process Safety Prevention and Compliant Operation and Maintenance

Long-term safe operation of container-type hazardous waste storage facilities depends on full-process safety prevention and standardized operation and maintenance management.The solution constructs a full-process safety prevention system of "prevention - monitoring - early warning - response" while establishing comprehensive operation and maintenance management systems to ensure long-term compliant, safe, and stable operation of facilities.to ensure long-term compliant, safe, and stable operation of facilities.

Source prevention is the core of safety prevention, focusing on classified storage and inbound/outbound management.Strictly follow hazardous waste categories and hazard characteristics for classified storage. Mixing incompatible hazardous wastes is strictly prohibited, such as oxidizing agents with flammable hazardous wastes, and acidic hazardous wastes with alkaline hazardous wastes, to avoid chemical reactions causing fires, explosions, toxic gas leaks, and other accidents.to avoid chemical reactions causing fires, explosions, toxic gas leaks, and other accidents.Before hazardous waste storage, packaging integrity and sign clarity are strictly checked to ensure no leakage or damage. Hazardous waste not meeting requirements is strictly prohibited from storage.Comprehensive hazardous waste inbound/outbound records are established, detailing hazardous waste generating unit, type, quantity, inbound time, outbound time, transfer destination, and responsible person information.information.Open flames and flammable and explosive items are strictly prohibited when entering the box. Operating personnel must wear protective equipment meeting requirements, including protective clothing, gloves, goggles, and gas masks.including protective clothing, gloves, goggles, and gas masks.

Real-time monitoring and early warning relies on intelligent monitoring systems to achieve precise control of various risks.24-hour real-time monitoring of combustible gases, toxic and harmful gases, temperature and humidity, and leakage conditions inside the box. Once parameters exceed standards, immediate audio-visual alarms are triggered.triggered, linked with related equipment for emergency response, and warning information is pushed to ensure timely response from management personnel.from management personnel.

The emergency response system addresses sudden accidents such as hazardous waste leakage, fires, and toxic gas leaks to reduce accident losses.Complete emergency response plans are developed, clarifying emergency organizational structure, response procedures, response measures, and responsibility division. Special response plans are developed for different types of sudden accidents.for different types of sudden accidents.Adequate emergency equipment is provided with regular inspection of completeness to ensure normal use.Emergency drills are conducted regularly to improve operating personnel's emergency response capabilities, ensuring rapid and scientific response after accidents to prevent accident escalation, and reporting to environmental protection and emergency management departments as required.as required.

Compliant operation and maintenance is key to achieving long-term compliance, establishing normalized operation and maintenance management systems.Daily operation and maintenance focuses on box cleaning, equipment inspection, and hazardous waste management. Regular box interior cleaning and disinfection are performed.are performed. Spilled hazardous waste and leaked liquids are promptly cleaned to keep the box interior clean and tidy.to keep the box interior clean and tidy.Seepage prevention and corrosion resistance layers are regularly inspected for integrity. If damage or aging is found, timely repairs are made.If damage or aging is found, timely repairs are made.

Ventilation systems, monitoring systems, fire-fighting facilities, and emergency equipment are regularly inspected to ensure normal operation. Damaged equipment is promptly repaired or replaced.Damaged equipment is promptly repaired or replaced.Regular hazardous waste packaging inspection is conducted. If packaging damage or leakage is found, timely replacement or handling is performed.is performed.

5. Typical Application Scenarios and Solution Advantages

The container-type hazardous waste storage facility complete solution is widely applicable to various industrial enterprises and environmental governance units that generate hazardous waste.It is particularly suitable for industries with large hazardous waste output, limited site conditions, and need for flexible deployment

such as chemical, machinery manufacturing, electroplating, metallurgy, pharmaceutical, new energy, textile dyeing, and coating industries.and coating industries. Personalized customized solutions can be provided based on specific enterprise needs.Personalized customized solutions can be provided based on specific enterprise needs.

In chemical enterprise scenarios, for acidic, alkaline, and organic hazardous wastes generated, the solution adopts acid and alkali-resistant and organic solvent-resistant seepage prevention and corrosion resistance design.The solution adopts acid and alkali-resistant and organic solvent-resistant seepage prevention and corrosion resistance design, combined with specialized exhaust gas purification systems to achieve classified storage of hazardous waste and compliant exhaust emissions.compliant exhaust emissions.Intelligent monitoring and explosion-proof and fire-proof systems are relied upon to prevent risks such as corrosion leakage, toxic gas volatilization, and fires.to prevent risks such as corrosion leakage, toxic gas volatilization, and fires.In machinery manufacturing enterprise scenarios, for hazardous wastes such as waste engine oil, waste paint, and waste cutting fluid, emphasis is placed on seepage prevention and leakage prevention and fire prevention control.Combustible gas monitoring and fire-fighting facilities are equipped to ensure storage safety.In environmental governance unit scenarios, for hazardous waste residues and waste adsorption materials generated during the governance process, modular combined design is adopted to flexibly adapt to site needs.to flexibly adapt to site needs. At the same time, leakage monitoring and environmental compliance control are strengthened to ensure compliance with specifications.

Compared with traditional built-in hazardous waste storage facilities, this solution has five core advantages: First, rapid deployment without civil engineering.Compared with traditional built-in hazardous waste storage facilities, this solution has five core advantages: First, rapid deployment without civil engineering. Completion in 7-15 days greatly shortens construction cycles.greatly shortens construction cycles. Second, flexible and movable, can be relocated or expanded according to site changes and capacity adjustments.Second, flexible and movable, can be relocated or expanded according to site changes and capacity adjustments.Third, safe and controllable, integrating multiple protections such as seepage prevention and

corrosion resistance, explosion-proof and fire-proof, and intelligent monitoring.Fourth, compliant and up to standard, fully complying with national industry standards such as GB18597-2023, enabling rapid acceptance and avoiding environmental supervision risks. Fifth, cost optimization with short construction cycles and low maintenance costs, eliminating long-term civil engineering and renovation investments, with overall costs lower than traditional built-in storage facilities.

6. Technology Development Trends

With the continuous tightening of environmental regulations and rapid development of intelligent technology, container-type hazardous waste storage facility complete solutions will continue to upgrade toward intelligence, greenization, integration, and standardization.

Following environmental protection technology industry development trends to better meet enterprise compliance and safety needs.to better meet enterprise compliance and safety needs.

Intelligent upgrading has become the core direction. Technologies such as IoT, big data, and artificial intelligence will be deeply integrated to achieve full-process intelligent control of hazardous waste storage.Technologies such as IoT, big data, and artificial intelligence will be deeply integrated to achieve full-process intelligent control of hazardous waste storage, including AI intelligent monitoring, automatic emergency response, remote operation and maintenance, and big data analysis.including AI intelligent monitoring, automatic emergency response, remote operation and maintenance, and big data analysis.It can automatically identify hazardous waste categories and monitor risk hazards, achieving "early discovery, early warning, and early response", greatly reducing manual management costs and improving safety prevention precision and efficiency.

Green development continues to advance. Environmentally friendly seepage prevention, corrosion resistance, and thermal insulation materials are adopted to reduce environmental impact of materials.Optimization of exhaust gas and wastewater recovery and utilization technology achieves resource utilization of pollutants during hazardous waste storage, reducing energy consumption and helping enterprises

achieve "dual carbon" goals.helping enterprises achieve "dual carbon" goals.Modular boxes adopt recyclable and reusable materials to improve resource utilization and promote green and low-carbon development.

Integrated solutions are becoming mainstream, integrating modular container renovation, equipment integration, safety prevention and control, exhaust purification, emergency response, and operation and maintenance management.integrating modular container renovation, equipment integration, safety prevention and control, exhaust purification, emergency response, and operation and maintenance management. It provides full-chain one-stop services while achieving linkage with enterprise existing environmental governance systems.while achieving linkage with enterprise existing environmental governance systems.It forms a closed-loop management of "storage - transfer - disposal", reducing enterprise management costs and improving compliance efficiency.

Deep integration of standardization and customization continues to improve. Standardized design of modular containers is further improved to form serialized products.to form serialized products. Adapting to different hazardous waste types and output volumes. At the same time, personalized customized solutions are provided based on specific enterprise conditions and site requirements.Adapting to different hazardous waste types and output volumes.Personalized customized solutions are provided based on specific enterprise conditions and site requirements, achieving precise adaptation of "one machine, one working condition", balancing the convenience of standardization and the practicality of customization.

7. Conclusion

The container-type hazardous waste storage facility complete solution is a new hazardous waste storage mode that adapts to environmental regulation upgrades and industrial enterprise development needs.It has core advantages including rapid deployment, flexible and movable, safe and controllable, compliant and up to standard, and cost optimization.It has core advantages including rapid deployment, flexible and movable, safe and controllable, compliant and up to standard, and cost optimization. It effectively solves many pain points of traditional built-in storage facilities and provides an efficient, convenient, and compliant integrated solution for

enterprise hazardous waste storage.It effectively solves many pain points of traditional built-in storage facilities and provides an efficient, convenient, and compliant integrated solution for enterprise hazardous waste storage.

This white paper systematically summarizes the technical system, construction deployment, safety prevention and control, compliant operation and maintenance, and application scenarios of the container-type hazardous waste storage facility complete solution.This white paper systematically summarizes the technical system, construction deployment, safety prevention and control, compliant operation and maintenance, and application scenarios of the container-type hazardous waste storage facility complete solution. Combined with national industry standards and practical experience, it provides enterprises with scientific and actionable technical references.Combined with national industry standards and practical experience, it provides enterprises with scientific and actionable technical references.