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GLOBAL LEADER IN SUPPLYING FLAKING, BRIQUETTING, AND PACKAGING SOLUTIONS

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天津华邦新材料科技有限公司
Tianjin Huabang New Material Technology Co., Ltd.
天津华邦智能装备制造有限公司
Tianjin Huabang Intelligent Equipment Manufacturing Co., Ltd.

天津华邦
Tianjin Huabang

COMPANY OVERVIEW

Tianjin Huabang New Material Technology Co., Ltd. (Tianjin Huabang)

Established by a group of university professors and senior engineers, Tianjin Huabang is a technology-led provider of turnkey process and equipment solutions for the fine-chemicals industry. Our core strengths are world-class process design, equipment engineering, and end-to-end technology delivery — capabilities that enable customers to convert ideas and raw materials into safe, efficient, and economically robust industrial operations.

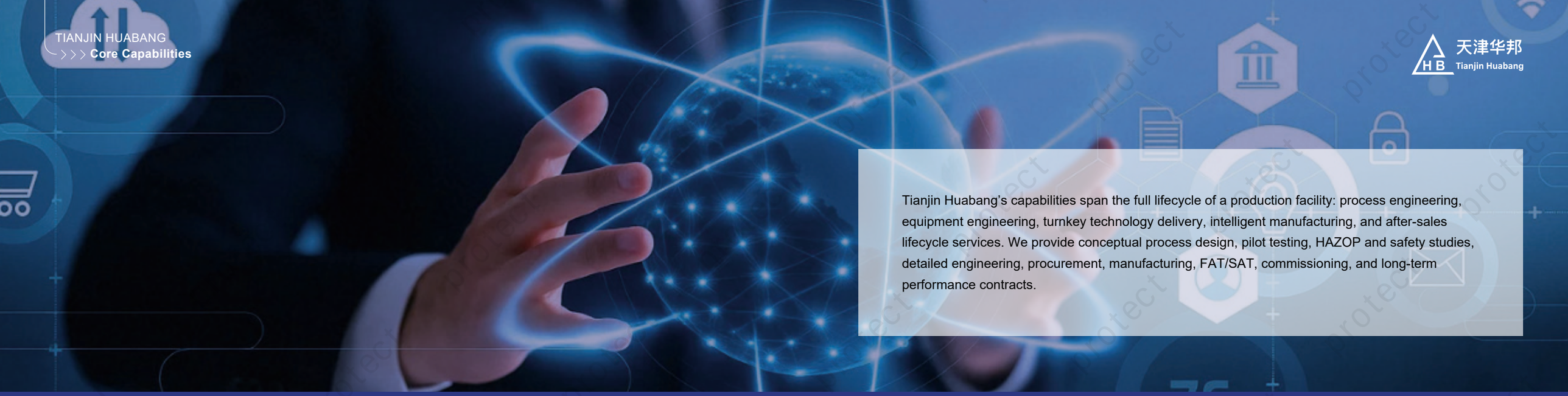
Vision

To be the global partner of choice for advanced fine-chemicals production, delivering safer, cleaner, and more innovative industrial systems.

Mission

To advance the chemical industry through technology leadership, deep customer collaboration, and sustainable engineering practices.

TIANJIN HUABANG



Tianjin Huabang’s capabilities span the full lifecycle of a production facility: process engineering, equipment engineering, turnkey technology delivery, intelligent manufacturing, and after-sales lifecycle services. We provide conceptual process design, pilot testing, HAZOP and safety studies, detailed engineering, procurement, manufacturing, FAT/SAT, commissioning, and long-term performance contracts.

CORE CAPABILITIES

EPC Capability & Global Execution

Tianjin Huabang is fully capable of accepting and executing EPC (Engineering, Procurement & Construction) projects worldwide. Our EPC delivery is structured and governed by international project management and quality systems to ensure predictable schedules, budgets, and compliant technical execution:

Engineering excellence:

Multidisciplinary engineering teams (process, mechanical, civil, electrical, instrumentation) deliver detailed design packages, stress calculations, P&IDs, and 3D models suitable for tendering and construction.

Procurement & Manufacturing:

Equipped with various international certifications, Tianjin Huabang fabricates key equipment at its own manufacturing site, strictly adhering to ASME standards, and procures auxiliary equipment solely executing international fabrication and inspection standards.

Construction & site supervision:

Experienced field engineering, construction management, site QA/QC, HSE, and commissioning teams to execute civil, mechanical, and E&I works and manage subcontractors.

Turnkey acceptance & handover:

FAT, SAT, performance testing and operator training, and complete documentation packs (as-built drawings, O&M, spare parts lists).

International compliance & standards:

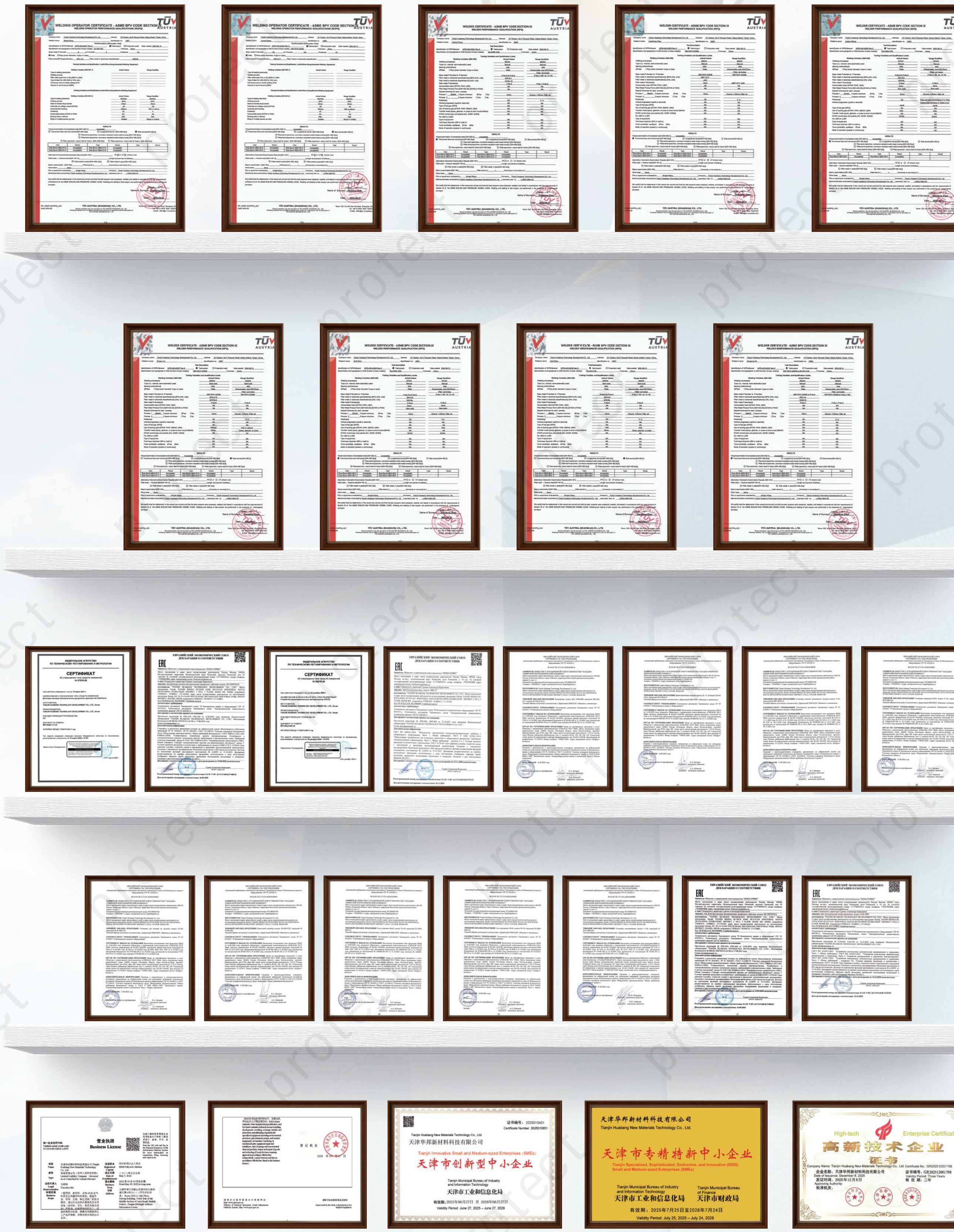
We design, fabricate, and certify equipment in accordance with international standards — ASME (pressure vessels, boilers), NACE (corrosion control), ISO (quality & management systems), IEC (electrical), and API (rotating equipment). All major equipment is offered with documentation and test reports that meet or exceed the customer’s jurisdictional requirements. Where required by project scope, we provide third-party inspection certificates, radiographic/UT weld reports, material certificates (ASTM), and traceable calibration records.

Global project experience:

Proven delivery of international projects with multi-jurisdictional regulatory compliance, export logistics, and local partner management; regional service network across various countries to support commissioning and after-sales.

R&D & INTELLECTUAL PROPERTY

As a national high-tech enterprise and industry contributor, Tianjin Huabang invests 8% of its revenue in R&D. Our patent portfolio and pilot labs reduce project risk and accelerate commercialization.



天津华邦
Tianjin Huabang

CERTIFICATE OF MARKET RANKING

Tianjin Huabang New Material Technology Co., Ltd.

天津华邦新材料科技有限公司

Market Position Certification

市场地位声明

TOP 1 in National Sales

for 3 Consecutive Years for

Flaking and Packaging Systems

结片包装系统销量

连续三年全国第一

数据来源： 深圳前瞻产业研究院，按照2022年、2023年、2024年度中国结片包装系统的销量统计，合并计算天津华邦新材料科技有限公司和天津市华邦科技发展有限公司的相关业务业绩（两家公司属于一致行动人控制），于2025年5月16日完成调研。结片包装系统（Flaking and Packaging System）主要包含结片机、造粒机、筛分机、输送机、包装机和码垛机等，主要应用于苯酐、顺酐、富马酸及丙烯酸等精细化工品全流程的生产。

Data Source: The ranking serves as the result of independent research by Shenzhen FORWARD Industry Research Institute Co.,Ltd., which is measured in terms of Sales Volume of Flaking and Packaging System in China in 2024. The research was completed by May 16th,2025.

深圳前瞻产业研究院有限公司

颁发日期

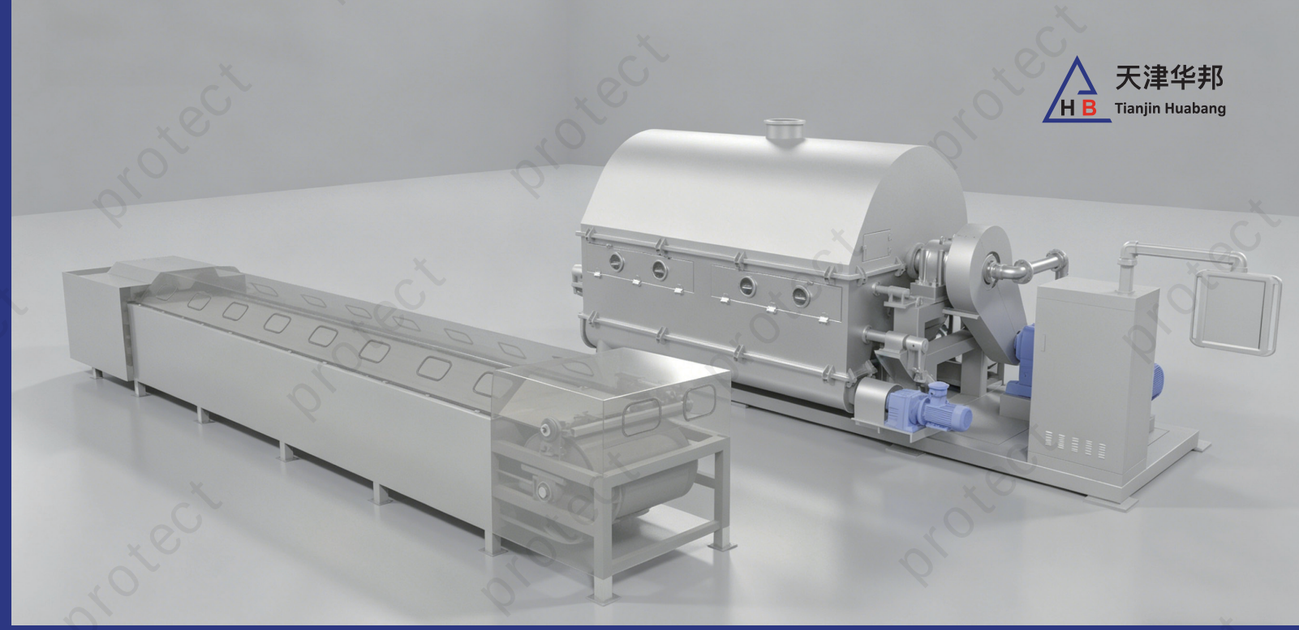
2025年5月16日

QIANZHANCHANYEYANJIUYUAN——2025051606688

OUR CLIENTS

CATEGORY

INTRODUCTION



Flaking & Cooling Systems——

Fully Enclosed Drum Flakers and Steel-Belt Cooling Flakers

Tianjin Huabang provides engineered flaking and cooling systems to continuously solidify molten products into stable, free-flowing solids for conveying, screening, storage, and packaging. This equipment family is developed for demanding chemical service, especially where the product is high-melting, sublimating, oxidation-sensitive, moisture-sensitive, or requires enclosed downstream handling.
Our flaking portfolio is built around two complementary technologies:

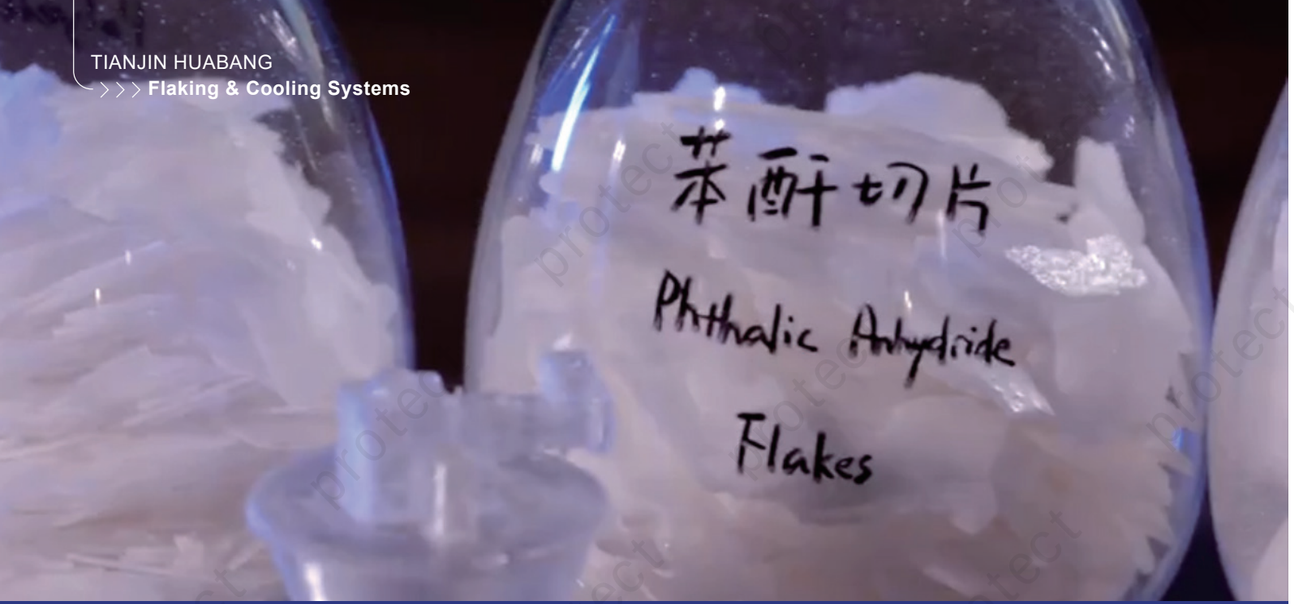
Fully Enclosed Heavy-Duty Water-Channel Drum Flaker

A continuous drum-based flaking system designed for high heat flux removal, stable flake thickness, and enclosed operation. The core feature is Huabang's heavy-duty internal water-channel cooling structure, developed to maximize turbulent coolant flow and heat-transfer performance.

Steel-Belt Cooling Flaker

A continuous belt-based flaking system in which molten product is distributed as a controlled layer onto a moving stainless-steel belt, rapidly cooled, solidified, and discharged as flakes or broken sheet product. This configuration is well-suited to wider product beds, longer cooling paths, and large-capacity continuous production.

Together, these systems provide a coherent downstream solution for molten-product finishing in anhydride, sulfur, wax, resin, and specialty chemical applications.



Fully Enclosed Heavy-Duty Water-Channel Drum Flaker

Product Description

The fully enclosed, heavy-duty drum flaker is a continuous solidification system that converts molten feed into thin, uniform flakes through controlled deposition on a cooled, rotating drum, followed by precision scraping and discharge. It is specifically engineered for products that require rapid and stable heat removal, strict enclosure, and repeatable flake geometry.

Huabang's heavy-duty design adopts a patented internal water-channel structure inside the drum. The coolant flow path is engineered to maintain high turbulence within the cooling channels, thereby increasing Reynolds number, reducing the thermal boundary layer, and significantly improving convective heat transfer. The result is faster heat removal, more uniform drum surface temperature, and more stable production under industrial operating conditions. This design approach has been developed through long-term simulation work, thermal optimization, and field operating experience.

Typical Applications

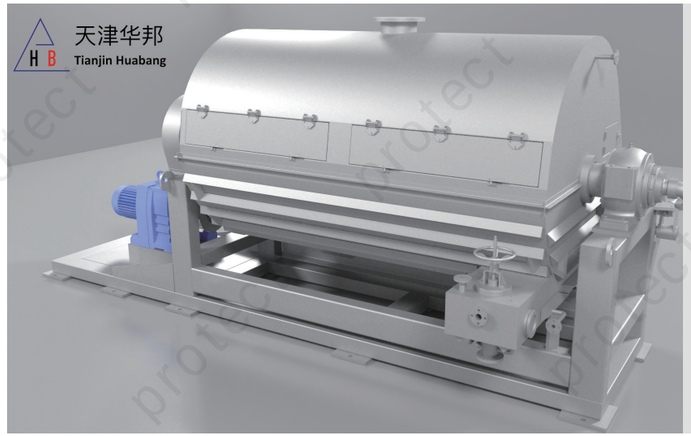
The heavy-duty drum flaker is particularly suitable for:

- phthalic anhydride
- maleic anhydride
- sulfur
- paraffin and waxes
- resinous melts
- specialty chemical intermediates
- oxidation-sensitive or sublimating products requiring enclosed handling

Product Configurations

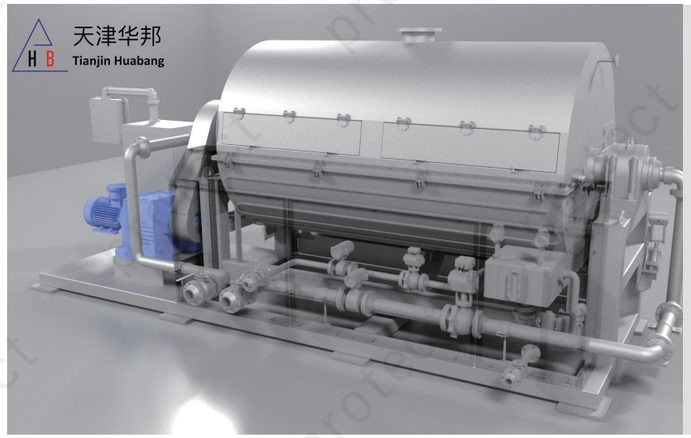
To match different project scopes and installation philosophies, the drum flaker is available in two main configurations.

Standard Flaker Package



A conventional equipment supply including the flaker body, cooling drum, scraper system, drive assembly, enclosure, local instruments, and utility/process interfaces. This arrangement is suitable where field piping and hook-up are completed within the broader plant installation scope.

Skid-Mounted Integrated Flaker System



A higher-integration package in which the flaker is mounted on a unified skid together with process piping, valves, instruments, utility manifolds, a local control cabinet, and a structural base. This arrangement improves installation quality, reduces field work, shortens commissioning time, and provides clearer battery limits for export and EPC projects. The skid-mounted concept is illustrated in the attached flaker comparison sheet.

Typical skid-mounted scopes include:

- flaker main machine
- cooling-water inlet and outlet manifold
- feed inlet and overflow / return piping
- drain and vent piping
- temperature, pressure, flow, and level instruments
- pneumatic and manual valves
- local control panel or junction box
- integrated base frame and maintenance access provisions

Key Technical Features

Turbulence-Enhanced Heat Transfer
The defining feature of the heavy-duty drum flaker is the internal water-channel cooling architecture. By sustaining high-Reynolds-number coolant flow within the drum, the system achieves strong turbulence and a markedly higher convective heat-transfer coefficient than conventional cooling arrangements. This improves heat extraction from the molten product, stabilizes surface temperature across the drum width, and supports consistent production of uniform flakes.

High Cooling Efficiency for Demanding Products
The water-channel structure is particularly effective for high-melting, sublimating, and thermally sensitive products. Stable and intensified heat removal improves product release, reduces localized hot spots, and increases process robustness where flake temperature and morphology are critical.

Fully Enclosed Process Environment
The machine body is fully enclosed to reduce vapor release, control sublimation loss, and protect product quality. Nitrogen purge, dry instrument air, or conditioned air can be incorporated where oxidation resistance or moisture protection is required. This arrangement also facilitates connection to local exhaust, dust-collection, or VOC-treatment systems.

High-Precision Drum Fabrication
The drum is manufactured from SS304, SS316L, or SS321, with fabrication and welding performed in accordance with international engineering practice. The drum surface is precision-ground to a mirror finish with a typical roughness of Ra ≤ 0.4 μm and coaxiality of ≤ 0.05 mm, ensuring stable rotation, uniform film formation, and long-term dimensional reliability.

Advanced Scraper System
The scraper assembly is designed for stable discharge and controlled flake formation. Blade materials may include high-performance alloys, special stainless steels, or engineering polymers such as carbon-fiber-reinforced PEEK, depending on product chemistry and service conditions. The blade angle and clearance can be adjusted manually or automatically, with fine-tuning to match the required flake thickness.

Integrated Instrumentation and Control
The drum flaker is supplied as an engineered process unit with variable-frequency drum speed control, flake-thickness monitoring, discharge-temperature indication, feed-level interlock, and cooling-system linkage. The control philosophy is designed to maintain stable flake thickness, stable discharge temperature, and consistent downstream handling performance. Drum rotation is typically adjustable between 1 and 7 rpm, depending on production demand and product characteristics.

Flexible Process Adaptation
Cooling media may include cooling water, chilled water, or glycol solution, while product-side heat preservation may use steam, hot water, or thermal oil. Feed arrangement, enclosure atmosphere, scraper material, and automation level can all be adapted to the product and project requirements.

Drum Flaker Model Selection

Common design basis for the series

Flake thickness: 0.05-3.00 mm, adjustable according to process requirement
Cooling medium: cooling water, chilled water, or glycol solution, depending on thermal duty
Heat-preserving medium: steam, hot water, or thermal oil, depending on product characteristics
Construction: heavy-duty enclosed water-channel drum design
Supply format: standard package or skid-mounted integrated package
Flange standard: available to ASME, ISO, or project-specific requirements

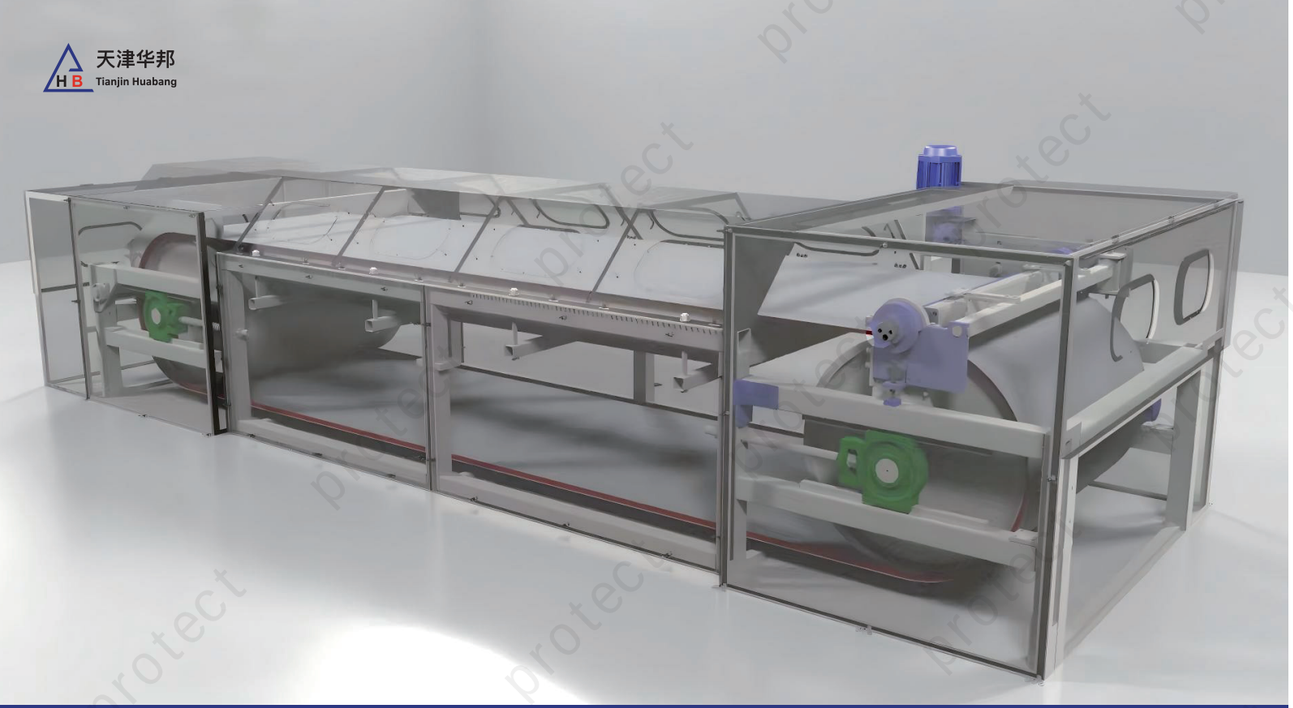
Model	Drum Diameter x Length (mm)	Effective Drum Area (m^2)	Indicative Capacity (t/h)	Drum Drive Power (kW)	Typical Application Range
NGJ-600x800	600x800	1.9	0.15-0.40	3.0	pilot, specialty products, small-batch lines
NGJ-900x1200	900x1200	4.1	0.40-0.90	5.5	small industrial lines, specialty chemicals
NGJ-1200x1500	1200x1500	6.6	0.80-1.60	7.5	medium-capacity enclosed flaking
NGJ-1500x2000	1500x2000	10.7	1.50-2.60	11.0	standard industrial chemical duty
NGJ-1500x3000	1500x3000	15.4	3.50-4.00	15.0	high-capacity phthalic / maleic anhydride service
NGJ-1700x3000	1700x3000	17.5	3.80-4.50	18.5	heavy-duty large-scale continuous flaking
NGJ-1700x3500	1700x3500	20.2	4.50-5.00	18.5	maximum-capacity enclosed industrial flaking

Actual capacity depends on melt viscosity, feed temperature, latent heat load, required flake thickness, coolant conditions, and final discharge temperature. Final equipment sizing is confirmed by process calculation.

Customization Options

The drum flaker platform supports extensive project-specific customization, including:

- standard machine or skid-mounted integrated package
- top spray feed, bottom tray feed, or combined feed arrangement
- nitrogen blanketing, dry-air purge, or warm-air enclosure
- manual or automatic scraper adjustment
- online flake-thickness measurement
- local or remote control architecture
- explosion-proof motors and instrumentation
- corrosion-resistant metallurgy and special coatings
- integrated exhaust hood or vapor take-off connection
- downstream linkage with vibrating screener, conveyor, and packaging line



Steel-Belt Cooling Flaker

Product Description

The steel-belt cooling flaker is a continuous cooling and solidification system for molten products that benefit from sheet-form deposition and controlled residence time on a moving belt. In this system, molten material is delivered through a heated feed system and evenly distributed as a thin layer across a stainless-steel cooling belt. The layer is cooled from below by recirculating cooling water and, where required, from above by controlled air cooling. After solidification, the product is discharged as flakes, broken sheets, or cut solids suitable for downstream transfer and packaging.

Compared with drum-based systems, the steel-belt cooling flaker offers a longer, more visible cooling path, a wider effective product bed, and is particularly well-suited to products that require gentle solidification, a wide distribution width, or larger production capacities. It is well-suited to the continuous finishing of sulfur, waxes, resins, hot-melt products, and selected anhydride services.

Process Principle

Molten material is delivered through a heated pipeline to a distributor or spreader system. The feed distributor forms a controlled, uniform layer on the moving steel belt. The belt passes over a cooling section where recirculating cooling water removes heat through the underside of the belt. As the product solidifies, the belt conveys the sheet to the discharge end, where the solidified layer is peeled off, broken, or cut to the required flake form. Belt speed, feed rate, and cooling intensity are controlled in concert to maintain stable product thickness and discharge conditions.

Product Variants

To suit different product behaviors and finishing requirements, the steel-belt platform can be configured in several ways.

Standard Layer Flaker

Molten product is spread as a thin layer on the belt and discharged as broken sheets or flakes. This is the most common arrangement for waxes, sulfur, and resin products.

Precision Distributor Flaker

Uses a refined feed-distribution system to improve layer uniformity across the full belt width. This configuration is suitable where product appearance, thickness consistency, or width utilization are particularly important.

High-Capacity Wide-Belt Flaker

Employs wider belts and extended cooling paths to achieve higher throughput. This arrangement is intended for large, continuous lines where the product's thermal load requires a longer residence time or a larger heat-transfer area.

Advanced Enclosed Flaker

Provides full enclosure, controlled atmosphere, vapor take-off, and improved operator isolation. This configuration is appropriate for odor-sensitive products, oxidation-sensitive melts, or plants with higher environmental and containment requirements.

Integrated Cutting or Breaking Version

Adds a downstream cutting, cracking, or flake-breaking device to produce a more tightly controlled final particle form for conveying and bagging.

Typical Applications

The steel-belt cooling flaker is suitable for:

- sulfur
- paraffin and petroleum waxes
- specialty wax blends
- resins and hot-melt products
- selected fertilizer and additive products
- recycled melt-derived solids
- chemical products requiring sheet cooling and flake discharge

Key Technical Features

Wide and Stable Cooling Surface
The steel belt provides a continuous, uniform cooling surface with excellent width utilization. This supports stable product distribution and reduces edge effects that can occur when molten product is confined to a smaller transfer area.

Gentle Continuous Solidification
Because the product forms and cools as a controlled layer rather than being rapidly removed from a curved drum surface, the steel-belt system is well-suited to products that benefit from a slightly longer residence time or gentler solidification.

Flexible Product Forming
By adjusting the feed distributor, belt speed, layer thickness, and discharge arrangement, the same basic machine platform can produce broken sheet, strip-like solid, or flake product. This allows the equipment to be adapted to product handling and packaging requirements.

High Cleanliness and Low Dust Generation
The process converts molten feed directly into solid product, without handling a powder-form intermediate. The enclosed arrangement, smooth belt surface, and controlled discharge help minimize secondary dust generation during the cooling stage.

Robust Cooling Control
The cooling section can be divided into zones to control early-stage set-up, mid-stage solidification, and final product conditioning. This is particularly valuable where the product has a narrow softening window or where excessive cooling shock could affect release behavior.

Advanced Belt and Surface Options
The belt can be supplied in selected grades and finishes to match corrosion, release, and cleanability requirements. Mirror-finish or high-grade stainless surfaces may be used where product appearance or release behavior is critical. Optional wear-resistant surfaces and anti-stick arrangements may be incorporated for difficult materials.

Distributor and Feed-System Engineering
The performance of a belt flaker depends strongly on the quality of the molten product distribution. Huabang can supply heated feed piping, pressure-stabilized distribution, filter and anti-blocking arrangements, and distributor formats selected according to product viscosity and required layer thickness.

Automation and Monitoring
The belt flaker can be integrated with PLC-based control, including belt speed adjustment, feed temperature monitoring, cooling water monitoring, product discharge temperature control, and alarm functions. This supports stable operation and easier integration with upstream melt handling and downstream conveying or packaging.

Steel-Belt Cooling Flaker Model Selection

Common design basis for the series

Belt speed: adjustable according to thermal load and capacity
Cooling medium: recirculating cooling water, with optional chilled water section
Product form: flakes, broken sheet, or strip-like solids, depending on distributor and discharge design
Supply format: open or enclosed frame, with optional integrated cutting / breaking device
Construction: stainless-steel belt with engineered support, tracking, and cooling system

Model	Belt Width (mm)	Effective Cooling Length (m)	Effective Cooling Area (m^2)	Indicative Capacity (kg/h)	Typical Positioning
SBC-800-6	800	6	4.8	150-350	compact line, pilot or specialty products
SBC-1000-10	1000	10	10.0	350-850	standard medium-capacity continuous flaking
SBC-1200-12	1200	12	14.4	600-1350	mainstream industrial production
SBC-1500-12	1500	12	18.0	850-1850	high-capacity sulfur, wax and resin duty
SBC-1500-15	1500	15	22.5	1000-2300	large-capacity continuous production
SBC-1800-15	1800	15	27.0	1300-2800	maximum-capacity wide-belt applications

Actual capacity depends on product melting point, viscosity, layer thickness, belt speed, feed-temperature stability, cooling-water temperature, and discharge specification.

Engineering Considerations for Model Selection

Selection of a steel-belt cooling flaker is typically based on:

- required throughput
- product melting point and viscosity
- allowable product residence time
- target product thickness and discharge form
- belt width utilization
- cooling-water availability
- enclosure and vapor-control requirement
- downstream breaker, screener, and packaging interface

For products with higher viscosity or narrow processing windows, attention is paid to distributor design, heated-feed stability, and cooling-zone balance. For larger-capacity duty, wider belts and longer effective cooling areas are generally favored to maintain a manageable layer thickness and reliable release.

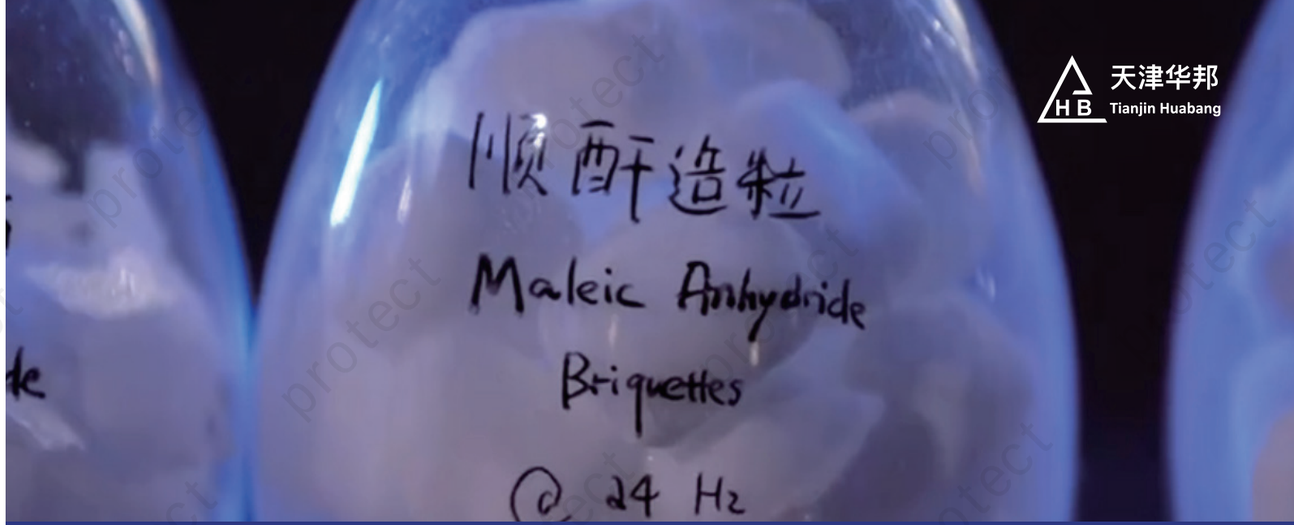
Customization Options

The steel-belt system can be customized with:

- enclosed or semi-enclosed machine body
- heated feed tank and heated transfer piping
- precision distributor or spreader bar
- filter and anti-blocking arrangement
- multi-zone cooling control
- belt washing or cleaning device
- flake breaker, cutter, or crusher
- vapor collection and exhaust interface
- local PLC/HMI control cabinet
- integration with screener, conveyor, and bagging line

Flaker System Integration

Both drum and steel-belt flakers can be supplied as stand-alone machines or as part of an integrated downstream package. Typical scope includes feed tank, heated piping, flaker, discharge conveyor, vibrating screener, storage hopper, packaging line, dust collection, and local control system. This integrated approach is particularly suitable for anhydride and sulfur flake projects where consistent product form, low dust generation, and efficient plant layout are critical.



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Briquetting & Granulating Systems——

Section Overview

Following flaking and cooling, many downstream solids require a further shaping step to improve bulk density, transport stability, feeding consistency, and commercial presentation. Tianjin Huabang supplies briquetting and granulating systems to convert flakes, powders, and molten materials into engineered solid forms suited for storage, conveying, screening, and packaging.
This product family is built around two core process routes:

Dry Roller Briquetting

A pressure-based dry compaction system that converts powder, flakes, or fine solids into dense briquettes or granules without adding water, binder, or external heat. This route is particularly suitable for purity-sensitive, heat-sensitive, or hygroscopic materials. The system is available in standard gravity-fed form and in advanced forced-feeding, hydraulically controlled execution for difficult materials and high-stability production duty.

Steel-Belt Cooling Granulation

A continuous melt-forming process in which molten product is deposited on a moving steel belt, cooled under controlled conditions, and discharged as granules, strips, or flake-like solids. This route is suited tomelt-processable materials that benefit from continuous forming, controlled residence time, and low-dust discharge.

Together, these technologies enable Huabang to offer a practical transition from melt handling and flaking to densification, particle formation, classification, and downstream transfer. In integrated plant layouts, briquetting and granulating systems are typically followed by screening, conveying, storage, and packaging, making them the natural link between the flaking and conveying sections.

Dry Roller Briquetting Systems

Product Description

The dry roller briquetting system is an advanced mechanical densification technology that compresses powders, flakes, or fine solids into uniformly shaped briquettes using a pair of counter-rotating rollers. This process is purely physical, eliminating the need for water, binders, or thermal drying stages. Consequently, the material's original composition is maintained, while bulk density, stability, and handling characteristics are significantly enhanced. The information emphasizes the system's environmental benefits, such as “zero addition” and “zero pollution,” with direct dry shaping particularly well-suited to purity-sensitive and heat-sensitive materials.

This equipment family is especially suitable where customers need to:

- eliminate caking and improve storage stability
- increase bulk density for transport efficiency
- avoid moisture introduction or binder contamination
- improve feeding behavior to downstream conveying and packaging systems
- standardize product form for industrial distribution

In practical fine-chemical service, dry roller briquetting is particularly effective for materials that are difficult to keep free-flowing in powder or flake form, or that must be compacted without altering chemical composition.

Working Principle

Material is fed into the nip between two synchronized, counter-rotating rollers. The roller surfaces are machined with forming pockets to produce the required geometry, such as pillow, oval, tablet, or custom briquette patterns. As the material enters the narrowing compaction zone, pressure increases progressively. Inter-particle voids are reduced, molecular contact increases, and the material is compacted into a coherent, shaped solid. After passing the highest-pressure point, the briquettes are released from the mold pockets and discharged by gravity.

Gravity Feed

Used for free-flowing flakes, coarse particles, and materials that can enter the roller bite naturally with stable fill conditions. This arrangement is simple, economical, and suitable for conventional dry compaction duty.

Forced Feed

Used for fine powders, low-bulk-density solids, sticky materials, or products with poor natural filling behavior. A screw feeder pre-compresses and forces the material into the roller gap, improving roll filling, increasing forming stability, and typically raising effective production efficiency by approximately 20% to 30% in suitable applications. For more demanding service, Huabang also provides advanced hydraulic pressure regulation, allowing roller force to be matched to changing material conditions in real time. Incorporating a full hydraulic control system, forced feeding, and local HMI control, the on-skid briquetting machine is offered as a packaged granulation unit.

Product Configurations

To make the product line more coherent and practical for industrial selection, the dry roller briquetting family is organized into three main execution types.

Standard Gravity-Fed Briquetter

A compact and economical configuration intended for flakes and granular solids with good flowability. Suitable for routine industrial compaction where bridging risk is low and product feed is stable.

Forced-Feed Dry Roller Briquetter

A reinforced arrangement incorporating screw pre-compression and more stable filling of the roll pockets. This is the preferred configuration for fine powders, difficult materials, and high-consistency industrial operations. Forced feeding is the preferred solution for poor-flow or bridge-forming materials.

Advanced Hydraulic Briquetting System

A higher-performance configuration combining forced feeding, closed-loop hydraulic pressure control, local HMI, and enhanced sealing. This configuration is suited to difficult or thermally sensitive materials where particle density, roll temperature, and production continuity must be tightly controlled. The design philosophy combines pressure control, chilled-roll cooling, and dry-air circulation into a single integrated system for long-term continuous operation.

Key Technical Features

Dry and Additive-Free Forming
The process requires no binder, no added water, and no thermal drying stage. This preserves product composition and makes the technology particularly suitable for fine chemicals, additives, pharmaceutical intermediates, and other materials in which contamination or thermal exposure must be avoided.

High-Density Product Formation
Dry roller compaction increases particle density and improves mechanical integrity, reducing dust generation and improving downstream handling. The bulk density can typically increase by 20% to 40%, and compressive strength can reach high industrial levels, depending on the material and forming geometry.

Flexible Feed Selection
The ability to select gravity feed or forced feed is central to practical performance. This allows the same technology platform to cover free-flowing flakes, coarse solids, and difficult-to-handle fine powders in a single coherent product line.

Custom Forming Geometry
Roll-pocket shape can be tailored to the required product form, including pillow, oval, rectangular, tablet, or project-specific geometries. This allows briquettes to be optimized for storage, dissolution, handling, or market presentation.

Heavy-Duty Roller and Drive Construction
The briquetting family uses precision-aligned rollers, robust shafting, hardened gear reduction, and industrial drive packages sized for continuous duty. The main motors are in the 15-110 kW class, with hardened reduction gearboxes and a precision drive arrangement, depending on model size.

Hydraulic Pressure Control for Stable Product Quality
Where specified, the hydraulic system enables dynamic adjustment of roll force to match product characteristics and load conditions. This is particularly important in maintaining density uniformity and stable briquette quality at higher throughput.

Closed and Low-Dust Operation
Sealed covers, compact machine layout, and downstream interfaces help reduce dust escape and allow easier connection to aspiration, screening, and conveying systems.

Advanced Hydraulic Briquetting for Difficult Materials
For demanding chemical service, Huabang can provide an enhanced dry-roller briquetting package with hydraulic regulation. In this execution, the machine integrates three critical controls into one coordinated forming platform:

Temperature Control
For temperature-sensitive materials, the roller shaft can incorporate chilled-water passages to maintain the roller surface below the critical sticking range.

Pressure Boosting
A hydraulic boosting system increases compaction capability and maintains dense, stable briquette formation. The hydraulic working pressure is around 10 MPa(g), with a maximum pressure of 20 MPa(g), with closed-loop control, accumulator buffering, and remote pressure indication.

Dehumidified Internal Environment
Where chilled rolls create a risk of condensation inside the machine enclosure, dry air can be introduced to maintain a low-dew-point internal atmosphere and prevent material contamination or sticking. The temperature control – pressure boosting – dehumidification combination is a core reliability feature for long-term continuous operation.

Other features from this advanced configuration include:
- roll-surface material in 630 stainless steel
- 316L stainless steel for product-contact feeding parts
- sealed bearings and side sealing to reduce dust ingress and material build-up
- explosion-protected motor specification and IP65 protection where required
- local HMI and interlocked control logic

Typical Applications

Dry roller briquetting is suitable for:
- phthalic anhydride and maleic anhydride solids
- sulfur and urea
- catalyst carriers and fine chemical intermediates
- pharmaceutical excipients
- food additives such as citric acid and vitamin C
- metal powders and mineral fines
- selected plastic or recycling powders requiring densification

Dry Roller Briquetter Selection Logic

For practical engineering use, the dry roller briquetter should be selected primarily by roller diameter, roller width, and required compaction force. Rather than presenting every theoretical combination, the model family is best grouped into compact, standard, and high-capacity industrial classes.

Compact Series

For lower-throughput production, specialty chemicals and pilot-to-industrial duty.

Standard Industrial Series

For mainstream chemical production with reliable daily operation and flexible briquette geometry.

Heavy-Duty Series

For large-capacity lines, higher specific pressure and demanding industrial service.

Dry Roller Briquetter Selection Table

Common design basis for the series

Forming method: dry physical compaction

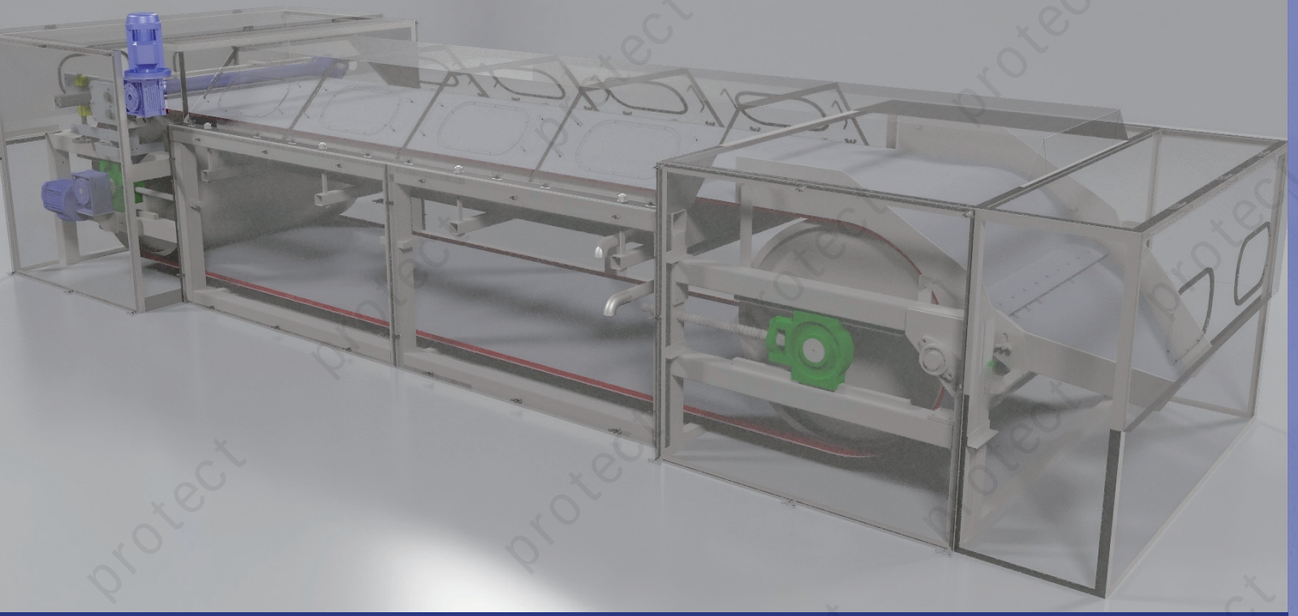
Feed mode: gravity feed or forced feed according to material flowability

Roll-pocket geometry: pillow, oval, tablet, briquette, or project-specific pattern

Construction: carbon steel / 304 / 316L / hardened stainless steel according to service

Pressure control: fixed-load mechanical compaction or hydraulic-regulated compaction, depending on model and application

Model	Roller Diameter x Width (mm)	Total Force (kN)	Specific Force (kN/cm)	Indicative Capacity (m^3/h)	Recommended Feed Arrangement	Typical Positioning
DR-475×110	475×110	1100	90	1.5	gravity / optional forced feed	compact entry model
DR-475×135	475×135	1100	125	1.8	gravity / optional forced feed	compact high-pressure duty
DR-575×165	575×165	1650	90	2.5	gravity / optional forced feed	compact industrial duty
DR-475×220	475×220	1100	55	3.0	gravity / optional forced feed	medium-width compact line
DR-575×220	575×220	1650	125	3.0	gravity / optional forced feed	standard chemical-duty line
DR-575×385	575×385	1650	55	4.6	gravity / forced feed preferred	wider medium-capacity line
DR-715×220	715×220	2420	90	5.3	gravity / forced feed preferred	mainstream industrial production
DR-475×355	475×355	1100	35	5.0	gravity / forced feed preferred	wide compact frame
DR-715×300	715×300	2420	125	7.2	forced feed preferred	higher-capacity standard line
DR-825×310	825×310	3300	125	7.4	forced feed preferred	heavy-duty industrial duty
DR-575×465	575×465	1650	35	7.7	forced feed preferred	low-specific-force wide roll duty
DR-880×385	880×385	4180	125	9.3	forced feed preferred	large-capacity heavy-duty line
DR-935×400	935×400	4400	125	10.5	forced feed preferred	maximum-capacity standard series
DR-715×440	715×440	2420	55	10.6	forced feed preferred	wide high-throughput production



Steel-Belt Cooling Granulation Systems

Product Description

For molten products that are better formed from the liquid phase than by powder compaction, Huabang supplies steel-belt cooling granulation systems. In this process, molten product is fed to a distributor, spread onto a moving stainless-steel belt, and rapidly cooled to form hemispherical, strip, or flake-like solids. The technology is suitable for continuous operation, low-dust product discharge, and consistent particle shaping over a wide production range. This machine is for molten materials with melting or softening points in the 50°C to 300°C range.

This product line complements the flaking systems described earlier. Whereas drum flakers are typically preferred for controlled thin-film flaking, the steel-belt granulation platform is preferred where the product is to be formed continuously into discrete granules, strip solids, or layer-based shaped material with a longer cooling path.

Working Principle

Molten material is transferred through insulated or heated piping to a distributor at the head of the machine. The distributor spreads the melt as a controlled layer or patterned deposit onto the moving steel belt. Beneath the belt, a continuous spray-cooling system rapidly removes heat from the belt surface. As the product advances along the belt, it passes through spreading, initial setting, full solidification, and discharge stages. At the discharge end, the belt turns around the end pulley, and the solidified product releases automatically due to differential thermal contraction and belt reversal.

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Key Technical Features

Continuous Melt-to-Solid Forming
The system converts molten feed directly into a transportable solid product in a single continuous step, reducing intermediate handling and improving plant cleanliness.

Efficient Belt-Based Cooling
A thin steel belt combined with forced underside cooling provides rapid and uniform heat removal. This arrangement can improve solidification rate by approximately 30% to 50% compared with conventional methods, while reducing thermal stress in the product.

Controlled Product Geometry
By adjusting distributor design, melt flow, belt speed, and cooling profile, the same basic platform can produce hemispherical granules, strips, or flake-like solids.

Low-Dust and Enclosed Operation
The machine can be supplied in an enclosed form to minimize dust escape, improve the operator environment, and simplify integration with local ventilation or gas treatment systems.

Flexible Thermal Control
PLC-linked control of belt speed, feed rate, and cooling-water temperature enables stable process operation, with temperature fluctuations typically within ±0.5 °C.

Durable Belt and Contact Construction
Core product-contact components are available in 316L stainless steel, with optional tungsten-carbide-coated components for abrasion resistance. The steel belt has a service life of at least 20,000 hours.

Optional Anti-Blocking and Pressure Distribution Systems
For more difficult melts or higher-viscosity products, the machine may be equipped with pressurized distributors, filtration, and anti-blocking arrangements.

Typical Applications

Steel-belt cooling granulation is suitable for:

- sulfur
- paraffin and wax blends
- resins
- asphaltic or hot-melt materials
- rubber additives
- hot-melt adhesives
- selected fertilizer or agricultural melt products
- recycled molten materials and process residues requiring controlled solidification

Steel-Belt Granulator Selection Table

Common design basis for the series

Product form: granules, strips, flakes, or sheet-broken solids

Cooling method: continuous spray cooling under a steel belt

Execution: standard, enclosed, or customized distributor package

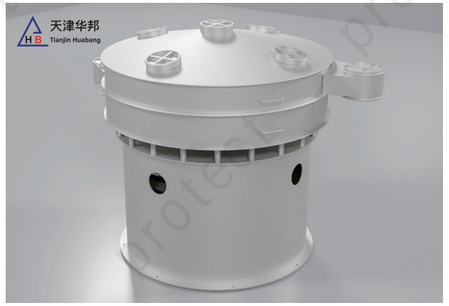
Model	Belt Width (mm)	Effective Cooling Length (m)	Effective Cooling Area (m^2)	Indicative Capacity (kg/h)	Typical Positioning
SBG-800-6	800	6	4.8	180-420	compact line, pilot or specialty melt granulation
SBG-1000-10	1000	10	10.0	400-950	standard medium-capacity continuous granulation
SBG-1200-12	1200	12	14.4	650-1450	mainstream industrial granulation
SBG-1500-12	1500	12	18.0	900-1950	high-capacity sulfur, wax and resin granulation
SBG-1500-15	1500	15	22.5	1100-2400	large-capacity continuous production
SBG-1800-15	1800	15	27.0	1400-2900	maximum-capacity wide-belt granulation

Actual output depends on melt viscosity, melting point, distributor design, particle geometry, layer thickness, belt speed, cooling-water temperature, and required discharge condition.

Vibratory Screening and Classification Support

Product Description

To complete the briquetting and granulating package, Huabang also supplies downstream vibratory screening systems for size classification, fines removal, and product finishing. In complete-line applications, the screening unit is typically installed immediately downstream of the briquetter or granulator to separate qualified product from oversize and fines before conveying and packaging.



Key Features

- multi-deck screening arrangement
- high screening efficiency for granules and briquettes
- stainless-steel product-contact parts
- enclosed operation for dust control
- rapid screen change, typically within 3-5 minutes
- single or multi-layer deck arrangement

This section is important because it creates the natural transition to the conveying section: after briquetting or granulation, the product is screened, qualified material is conveyed onward, and off-spec fractions are recycled or reprocessed.

System Integration

Huabang's briquetting and granulating systems can be delivered as stand-alone machines or as complete downstream modules including:

- feed hopper and metering equipment
- dry roller briquetter or steel-belt granulator
- hydraulic and local control system
- vibratory screener
- recycle and fines return logic
- discharge conveyor
- storage hopper and bagging interface
- dust collection and local aspiration connections

This integrated approach allows the shaping section to function as a stable bridge between melt solidification or raw powder handling on the upstream side and conveying, storage and packaging on the downstream side.

Conveying Systems——

Section Overview

Tianjin Huabang supplies conveying systems as part of an integrated downstream solids-handling platform for flakes, granules, and moderately free-flowing powders. These systems are engineered to connect flaking,screening, storage, and packaging in a stable, low-loss, and plant-friendly manner. The conveying portfolio is intended for continuous industrial duty in chemical and related process industries, with emphasis on controlled transfer, enclosed operation, equipment compatibility, and straightforward integration into automated production lines.
In practical project execution, conveying equipment is not selected as an isolated utility. It is selected as a process link that must match the material form, conveying distance, required elevation, dust-control philosophy, plant layout, and downstream feeding precision. For this reason, Huabang organizes its conveying solutions into several complementary equipment families rather than promoting a single universal design.

The core conveying portfolio includes:

Screw Conveyors and Screw Feeders

For horizontal, inclined, or short vertical transfer of flakes, granules, and moderately free-flowing solids, with good enclosure and strong adaptability to process interfaces.

Bucket Elevators

For efficient vertical lifting in limited floor space and for stable transfer to higher storage or packaging points.

Belt Conveyors and Belt Feeders

For gentle transfer over medium distances, especially where product degradation must be minimized, and stable continuous flow is important.

Vibratory Conveyors

For controlled transfer, spreading, and gentle movement of solids, particularly useful where low material breakage and clean discharge are important.

Pneumatic Conveying Systems

For enclosed transfer of granules and selected powders over longer distances, especially where dust control, routing flexibility, or plant cleanliness is a priority.

Together, these systems allow Huabang to offer a complete line solution from product discharge through intermediate transfer to bagging, big-bag filling, storage, or further processing.

Product Positioning and Engineering Approach

Huabang conveying systems are designed for industrial production environments in which reliability, containment, and maintainability are as important as nominal throughput. The engineering focus is not only on moving the product, but on preserving product quality and ensuring stable operation of the full line.

This is particularly important in downstream systems handling:

- flaked products that must not be excessively broken,
- granules that must remain free-flowing,
- materials that may produce nuisance dust,
- heated or recently solidified products that require controlled handling,
- chemical products that demand corrosion resistance or enclosed transfer.

Accordingly, conveying-system design is developed around five practical engineering factors:

Material Form

Flakes, granules, and moderately free-flowing powders do not behave in the same way. Product geometry determines the most suitable conveying principle, the internal clearances, transfer points, and anti-bridging measures.

Process Duty

Conveying may serve simple transfer, controlled feeding, elevation, buffering, or line balancing. The selected machine must therefore match not only capacity, but also the role it plays in the process.

Layout and Distance

Short transfer between connected equipment may favor screw or vibratory designs, while longer or more complex routing may justify belt or pneumatic systems.

Containment Requirement

Where dust control, odor control, or enclosed operation is required, the conveyor must support sealed interfaces and easy integration with local exhaust or dust-collection systems.

Downstream Stability

Packaging lines, screening systems, and storage hoppers all depend on consistent feed. Conveyors must therefore deliver stable, non-pulsing product flow within the required capacity window.

Screw Conveyors and Screw Feeders

Product Description

Screw conveying systems are among the most practical and widely used transfer methods for the enclosed movement of flakes, granules, and moderately free-flowing solids. They are particularly suitable for short- to medium transfer distances and for direct connections between process equipment such as flakers, hoppers, screeners, and bagging machines.

The system consists of a rotating screw inside a trough or tubular casing. As the screw rotates, the material is advanced along the conveyor axis and discharged at the outlet. The design can be adapted for horizontal, inclined, and selected short vertical duties, depending on product behavior and required feed stability.

Typical Applications

Screw conveyors are commonly selected for:

- flaker discharge to screening or intermediate collection
- hopper discharge to packaging systems
- transfer of granules to storage bins
- controlled metering into bagging or weighing equipment
- enclosed transfer where dust reduction is required

Key Technical Features

Compact and Enclosed Construction

Screw conveyors provide a compact mechanical layout and are well-suited to installation beneath flakers, bins, and hoppers. The enclosed casing helps reduce product loss, dust escape, and environmental contamination.

Strong Process Integration

Because the inlet and outlet arrangement can be adapted easily, screw conveyors are effective as direct interconnecting equipment between upstream and downstream machines. This makes them particularly useful in packaged skid systems and compact plant layouts.

Flexible Feeding Characteristics

The same basic design can be used for either transfer or controlled feed. With appropriate speed control and screw geometry, the machine can provide relatively stable discharge into weighers, packaging machines, or secondary conveyors.

Adaptability to Product Condition

Pitch, shaft design, screw diameter, and casing geometry can be selected according to whether the product is flake-like, granular, warm, light-density, or somewhat cohesive.

Material and Surface Options

Contact parts may be supplied in carbon steel, SS304, or SS316L, with surface treatment or liners selected according to corrosion, cleanability, and wear requirements.

Screw Conveyor Selection Table

Common design basis for the series

Execution: tubular or U-trough screw conveyor

Installation: horizontal or inclined

Drive: geared motor with variable-frequency option

Construction: carbon steel, SS304 or SS316L according to service requirement

Model	Nominal Screw Diameter (mm)	Typical Capacity Range (t/h)	Typical Drive Power (kW)	Typical Positioning
JM-SC -150	150	0.3-1.0	1.5-3.0	small transfer, feeder discharge, compact lines
JM-SC -200	200	0.8-2.0	2.2-4.0	standard light-duty process transfer
JM-SC -250	250	1.5-3.5	3.0-5.5	mainstream flake and granule transfer
JM-SC -300	300	2.5-5.0	4.0-7.5	industrial transfer to screening or packaging
JM-SC -400	400	4.0-8.0	5.5-11.0	high-capacity downstream solids handling
JM-SC -500	500	6.0-12.0	7.5-15.0	large-capacity industrial transfer duty

Actual capacity depends on bulk density, product flowability, inclination, moisture level, inlet condition, and required fill factor.

Customization Options

Available options include:

- shafted or shaftless screw arrangement
- variable pitch or special flight design
- quick-open covers for cleaning and inspection
- anti-bridging feed hopper
- wear-resistant liners
- gas-tight or dust-tight sealing arrangement
- feed-control instrumentation and interlocks
- explosion-proof motor and instrument package

Bucket Elevators

Product Description

Bucket elevators are used where material must be lifted vertically with high efficiency and minimal floor space. They are especially suitable for transferring flakes or granules from lower process elevations to storage bins, buffer hoppers, or packaging floors.

Material is loaded into a series of buckets attached to a belt or chain. The buckets travel upward within an enclosed casing and discharge the material at the top through centrifugal or gravity-type unloading, depending on product behavior and system design.

Typical Applications

Bucket elevators are commonly used for:

- lifting flaked product to storage silos or day bins
- feeding elevated screening or packaging stations
- vertical transfer in multi-floor process buildings
- space-efficient integration into compact production layouts

Key Technical Features

Efficient Vertical Transfer

Bucket elevators provide a large vertical lift within a small footprint, making them well-suited to plants where horizontal space is limited.

Good Capacity-to-Footprint Ratio

Compared with inclined conveyors that occupy large floor space, the bucket elevator offers a cleaner, more compact route for product elevation.

Enclosed Product Path

The closed casing supports cleaner handling and reduced material loss. It also makes integration with dust control easier in areas where product fines may be present.

Configurable Bucket and Discharge Design

Bucket shape, spacing, and discharge arrangement can be selected to suit flakes, granules, or other bulk solids, reducing material hang-up and improving discharge stability.

Bucket Elevator Selection Table

Common design basis for the series

Execution: belt or chain type

Construction: carbon steel, SS304 or SS316L

Arrangement: vertical lift with enclosed casing

Model	Bucket Width (mm)	Typical Capacity Range (t/h)	Typical Lift Height (m)	Typical Drive Power (kW)	Typical Positioning
JM-BE -200	200	1.0-3.0	5-15	2.2-5.5	compact vertical lifting duty
JM-BE -300	300	2.5-6.0	6-20	4.0-7.5	standard industrial elevation
JM-BE -400	400	4.0-10.0	8-25	5.5-11.0	mainstream flake and granule lifting
JM-BE -500	500	6.0-15.0	10-30	7.5-15.0	high-capacity vertical transfer

Actual performance depends on product bulk density, bucket fill efficiency, lift height, and discharge behavior.

Customization Options

Available options include:

- belt-type or chain-type arrangement
- anti-backstop device
- explosion relief and venting interface
- inspection doors and maintenance platforms
- wear-resistant boot section
- level switch and blockage alarm
- integrated inlet hopper and discharge chute design

Belt Conveyors and Belt Feeders

Product Description

Belt conveyors are selected for gentle, stable transfer over medium distances. They are especially suitable for flakes and granules that should be handled with minimal breakage or compression.
In a belt conveyor, the product travels on a continuously moving belt supported by rollers or a slider bed. Because the product rests on the belt rather than being mechanically pushed or agitated, this conveying principle is well-suited to applications where product preservation and clean discharge are important.

Typical Applications

Belt conveyors are commonly used for:

- transfer of flaked product to screening or packaging
- gentle movement of the finished product to storage
- horizontal or mildly inclined transport between process areas
- discharge from the breaker, screener, or inspection station

Key Technical Features

Gentle Product Handling
The belt conveyor is often preferred where flake integrity must be preserved and product attrition minimized.

Stable Continuous Flow
The belt provides a smooth conveying profile with minimal pulsation, which is beneficial when downstream equipment requires a steady and predictable product load.

Flexible Layout
The machine can be configured with different lengths, inclinations, and discharge arrangements to suit the plant layout.

Adaptable as Conveyor or Feeder
With proper weighing or speed control, the same platform can be used not only for transport but also for controlled feeding to downstream equipment.

Belt Conveyor Selection Table

Common design basis for the series

Belt width: selected according to capacity and product bed depth
Construction: carbon steel or stainless steel frame
Belt type: smooth, cleated or food/chemical-grade according to service

Model	Belt Width (mm)	Typical Capacity Range (t/h)	Typical Drive Power (kW)	Typical Positioning
JM-BC -500	500	1.0-4.0	1.5-3.0	gentle transfer, compact layouts
JM-BC -650	650	2.0-6.0	2.2-4.0	standard downstream conveying
JM-BC -800	800	3.0-10.0	3.0-5.5	mainstream flake and granule handling
JM-BC -1000	1000	5.0-15.0	4.0-7.5	high-capacity process transfer

Actual capacity depends on material bulk density, belt speed, belt inclination, and allowable bed depth.

Customization Options

Available options include:

- smooth or cleated belt
- enclosed covers and side sealing
- belt weighing arrangement
- receiving hopper and discharge chute
- support legs, platforms, and walkways
- integrated metal detector or checkweigher interface
- reversible or fixed-direction operation

Vibratory Conveyors

Product Description

Vibratory conveyors provide controlled movement of solids through vibration rather than continuous dragging or pushing by a mechanical element. They are especially suitable for applications where gentle handling, controlled spread, and clean discharge are required.

The conveyor tray is excited by a vibratory drive, causing the product to advance in small repeated movements. Because the product is moved in a shallow bed with limited mechanical compression, this method can be beneficial for fragile flakes or for controlled product distribution ahead of screening or packaging.

Typical Applications

Vibratory conveyors are commonly used for:

- flake discharge and spreading
- transfer to screeners or inspection points
- controlled feeding to packaging or accumulation hoppers
- low-breakage movement of fragile products

Key Technical Features

Gentle Product Transport
The shallow-bed transport mechanism can reduce product degradation compared with more aggressive conveying methods.

Good for Controlled Distribution
Vibratory conveyors are useful when the product needs to be spread evenly before entering another machine.

Compact and Clean Design
The equipment can be built in a relatively compact format and is easy to integrate into enclosed or semi-enclosed process arrangements.

Simple Mechanical Principle
With fewer moving internal contact components than some other conveyor types, the vibratory conveyor can provide reliable service within its proper duty range.

Model	Tray Width (mm)	Typical Capacity Range (t/h)	Typical Drive Power (kW)	Typical Positioning
JM-VC -200	200	0.2-0.8	0.25-0.55	fine transfer and controlled feeding
JM-VC -300	300	0.5-1.5	0.55-0.75	standard light-duty flake handling
JM-VC -500	500	1.0-3.0	0.75-1.5	mainstream downstream transfer
JM-VC -800	800	2.0-5.0	1.5-2.2	high-capacity controlled distribution

Actual capacity depends on product size, bed depth, vibration setting, and required conveying length.

Pneumatic Conveying Systems

Product Description

Pneumatic conveying systems are used where enclosed transfer over longer distances is required, or where the routing flexibility of pipework offers a strong plant-layout advantage. These systems are generally applied to granules and selected powders rather than fragile flakes, unless the product can tolerate the conveying conditions.
Material is introduced into an air stream and conveyed through a pipeline to the receiving point. Depending on product characteristics and process requirements, the system may be designed as a dilute-phase or denser, lower-velocity transfer.

Typical Applications

Pneumatic systems are commonly used for:

- transfer of granules to storage or packaging zones
- enclosed movement of selected powders
- routing through congested or multi-level plant areas
- dust-controlled transfer where open conveyors are undesirable

Key Technical Features

Highly Enclosed Transfer Path
The pipeline system provides robust containment and helps reduce dust emissions into the plant environment.

Flexible Routing
Pipelines can be routed around structural and layout constraints more easily than many mechanical conveyors.

Clean Plant Integration
Pneumatic systems are suitable where material transfer must be combined with tidy plant layout and minimal open handling.

Configurable Receiving and Filtering
The system may include filters, receivers, rotary valves, and air-material separation arrangements, depending on the product and duty.

Pneumatic Conveying Selection Table

Common design basis for the series

Execution: pressure or vacuum conveying
Material form: granules and selected powders
Construction: carbon steel or stainless steel pipeline and receiver

Model	Line Size (mm)	Typical Capacity Range (t/h)	Typical Conveying Distance (m)	Typical Positioning
JM-PC -80	80	0.3-1.0	10-40	small enclosed transfer
JM-PC -100	100	0.8-2.0	15-60	standard granule conveying
JM-PC -125	125	1.5-4.0	20-80	mainstream industrial duty
JM-PC -150	150	3.0-6.0	30-100	larger-capacity enclosed transfer

Actual performance depends on particle size, density, friability, line routing, conveying pressure, and air-to-solids ratio.

Customization Options

Available options include:

- vacuum or pressure mode
- receiver and filter module
- rotary valve or screw feeder inlet
- anti-abrasion elbows
- explosion isolation provisions
- PLC-based pressure and sequence control
- integration with silo, hopper, and bagging systems

System Selection Logic

For practical project use, conveying systems should be selected based on the duty rather than on machine category alone.

Screw conveyors are generally preferred for compact, enclosed transfer between directly connected machines.

Bucket elevators are preferred where vertical lifting is necessary and floor space is limited.

Belt conveyors are preferred where gentle product handling and steady flow are critical.

Vibratory conveyors are preferred where controlled spread, low breakage, or light-duty transfer is required.

Pneumatic conveying is preferred where full enclosure, longer routing flexibility, or dust-controlled transfer is the primary requirement.

In numerous projects, an optimal solution often involves combining multiple conveyor types rather than relying on a single system. A typical configuration includes a screw conveyor for flaker discharge, a bucket elevator for product elevation, a belt conveyor for buffer transfer, and a screw or vibratory feeder for precise metered feed to packaging. This integrated approach enhances overall plant performance compared to using a single conveying principle throughout the process.

Materials of Construction and Control Philosophy

Conveying equipment can be supplied in carbon steel, SS304, or SS316L, depending on corrosion level, hygiene requirements, and client specifications. Contact surfaces, seals, chutes, and hoppers are selected according to product behavior and service environment.

The control philosophy may include:

- variable-frequency speed control
- running and blockage interlocks
- bin level and no-flow monitoring
- overload protection
- local emergency stop and maintenance safety interlocks
- communication with upstream flaker and downstream packaging control systems
- storage hopper and bagging interface
- dust collection and local aspiration connections

Where required, systems can be supplied in an explosion-proof configuration and integrated into a broader plant automation architecture.

Integrated Downstream Supply

Huabang conveying systems can be delivered as stand-alone machines or as part of a complete downstream solids-handling line. A typical integrated scope may include flaker discharge, intermediate conveying, screening, storage hopper, weighing feed, small-bag packaging, ton-bag filling, and associated dust-control interfaces. This integrated capability is especially valuable in chemical production lines where stable product transfer is essential to packaging accuracy, plant cleanliness, and overall operating reliability.

Packaging — Primary & Secondary——

Section Overview

Tianjin Huabang supplies packaging systems as a fully integrated continuation of the downstream solids-handling line. The packaging scope is designed for flakes, granules, and moderately free-flowing powders, with emphasis on clean transfer, stable weighing, dust-controlled filling, and dependable end-of-line automation. The systems are intended to connect directly with flakers, conveyors, screening units, storage hoppers, and palletizing equipment, forming a coherent production route from solidification to finished dispatch.

The packaging portfolio is organized in two coordinated levels:

Primary Packaging

For accurate bag filling, weighing, compaction, and closure of finished products in small-bag or FIBC/ton-bag formats.

Secondary Packaging and End-of-Line Automation

For case handling, palletizing, wrapping, inspection, and logistics-ready discharge.

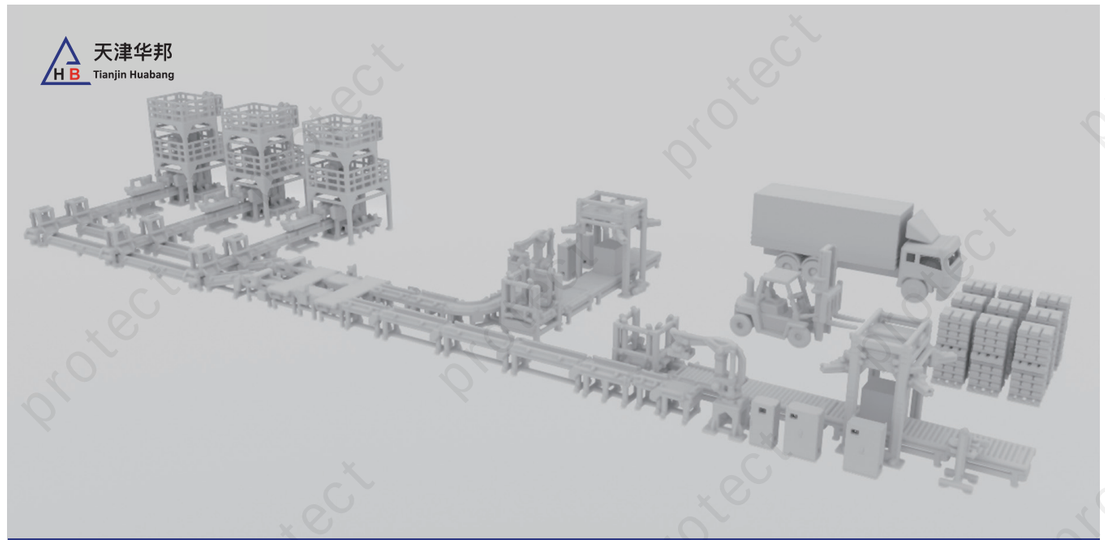
This approach allows the line to be configured according to the required degree of automation, plant layout, bag specification, and product characteristics, while maintaining a consistent engineering platform across the project.

Product Positioning and Application Range

Huabang packaging systems are intended for dry solids produced from downstream chemical finishing systems, especially:

- flaked products from drum or steel-belt flakers
- granules from cooling and finishing lines
- moderately free-flowing powders with controlled dust characteristics

Primary Packaging Systems



Fully Automatic Small-Bag Packaging Systems

Product Description

The fully automatic small-bag packaging system is designed for 10-50 kg filling of flakes, granules, and moderately free-flowing powders into paper bags, woven bags, and PE-lined bag formats. The machine combines bag feeding, bag opening, clamping, weighing, filling, compaction, transfer, and sealing into a single coordinated system. The system can be supplied in FS (Fill & Seal) configuration as the standard industrial format, and FFS (Form-Fill-Seal) configuration, where the bag-forming route is preferred for the project.

Key Technical Features

Stable High-Accuracy Weighing
The filling system is built around gravimetric control with load cells and programmable feed sequencing. Typical weighing accuracy is up to ±0.1% for suitable powder duty and ±0.2% for granules, depending on product consistency and filling configuration

Flexible Feed Arrangement
The feed module may be supplied as a gravity, screw, or belt feed, depending on product flowability, density, and bridging tendency. This allows the same basic packaging platform to handle flake, granule, and selected powder duties without forcing one unsuitable feed principle onto every application.

Integrated Bag Handling
The bagging line includes automatic bag pickup, bag opening, positioning, and clamping. This reduces operator dependency and improves repeatability at higher running rates.

Dust-Controlled Filling
The filling zone can be equipped with dust-hooding, aspiration interfaces, and a controlled discharge geometry to reduce airborne dust and improve the working environment.

Modular Closure Options
Heat sealing, sewing, fold-and-sew, or combined closure arrangements can be selected according to bag type and client packaging standards.

Line Integration
The system is easily combined with upstream conveying and downstream palletizing, metal detection, check weighing, or wrapping equipment.

Small-Bag Packaging Selection Table

Common design basis for the series

Bag size: 10-50 kg
Applicable products: flakes, granules, moderately free-flowing powders
Bag types: paper bags, woven bags, PE-lined bags
Execution: FS standard line or FFS line according to project requirements

Model	Packaging Format	Typical Capacity (bags/h)	Typical Weighing Range (kg/bag)	Typical Positioning
JM-FS -200	automatic fill -and-seal	150-250	10-50	compact industrial line, lower-throughput duty
JM-FS -350	automatic fill -and-seal	250-350	10-50	standard production line
JM-FS -500	automatic fill -and-seal	350-500	10-50	mainstream medium-to-high capacity packaging
AV-FFS -300	form-fill-seal	200-300	10-25	integrated bag-forming and filling duty
AV-FFS -700	form-fill-seal	350-700	10-25	higher-capacity automated packaging line

Actual capacity depends on product flowability, bag type, filling method, closure method, and required weighing tolerance.

Fully Automatic FIBC / Ton-Bag Packaging Systems

Product Description

The fully automatic FIBC/ton-bag system is intended for bulk filling of 500 kg and 1000 kg bags with flakes, granules, and selected powders. The line is designed for stable, high-accuracy industrial bulk packaging, with reliable bag support, controlled filling, and clean discharge.

Key Technical Features

Three-Stage Filling Logic
The filling cycle is typically configured with coarse, medium, and fine feeds, enabling precise final weight control without sacrificing productivity.

Stable Bag Support and Clamping
The machine includes bag-support and clamping arrangements designed to maintain filling stability and reduce leakage at the filling head.

Good Compatibility with Flake and Granule Duty
The system is particularly suitable for solid chemical products where bagging in large format improves logistics efficiency and reduces manual handling.

Automation and Data Integration
The machine may be connected to PLC / HMI control, production records, recipe parameters, and line interlocks with upstream storage or conveying systems.

Ton-Bag Packaging Selection Table

Model	Typical Bag Size	Typical Capacity (t/h)	Typical Product Form	Typical Positioning
TB-500	500 kg FIBC	4-6	flakes / granules / selected powders	compact bulk packaging
TB-1000	1000 kg FIBC	6-10	flakes / granules / selected powders	standard industrial bulk bagging
TB-1000D	1000 kg FIBC with advanced automation	8-12	flakes / granules / selected powders	high-duty integrated packaging line with adjustable bagging dimensions

Tianjin Huabang's ton-bag systems are positioned for high-accuracy bulk packaging with intelligent weighing control and staged feeding, including mixed 500 / 1000 kg production philosophy where required

Secondary Packaging and End-of-Line Systems

Product Description

Secondary packaging and end-of-line systems complete the packaging train by preparing finished bags for transport, storage, and warehouse handling. These systems are selected based on bag format, pallet pattern, output rate, and logistics standards.

Product Families

- **check weighing and metal detection**
- **bag flattening and conditioning conveyors**
- **robotic palletizers**
- **gantry palletizers**
- **pallet conveyors and accumulation stations**
- **stretch wrapping systems**
- **stretch hooding systems**
- **labeling and coding stations**

Key Technical Features

Stable Flow from Primary Packaging to Dispatch
End-of-line equipment is engineered to receive product directly from the bagging system without compromising line rhythm or bag integrity.

Flexible Palletizing Logic
Layer pattern, bag orientation, and pallet dimensions can be programmed according to export or plant standards.

Inspection and Quality Control
Optional check weighers and metal detectors improve outgoing product assurance and help maintain packaging consistency.

Warehouse-Ready Discharge
Wrapping, strapping, and labeling prepare the finished pallet directly for forklift handling and storage.

Secondary Packaging Selection Table

Model Group	Typical Duty	Typical Throughput Range	Typical Positioning
JM-EOL -CW	check weigher / inspection	matched to bagging line	quality assurance and reject handling
JM-EOL-PAL-R	robotic palletizer	up to medium bagging rates	flexible pallet patterns
AV-EOL-PAL-G	gantry palletizer	medium to high bagging rates	high-repeatability palletizing
JM-EOL-WRAP	stretch wrapper	matched to typical palletizing line	pallet stabilization
AV-EOL-STRAP	Stretch hood	matched to highly organized palletizing line	reinforced transport packaging

System Integration

Huabang packaging systems can be supplied as stand-alone equipment or as part of a complete downstream handling line, including conveying, storage hoppers, flakers, screeners, filling equipment, end-of-line automation, and dust-control interfaces. This integrated approach is particularly effective where plant cleanliness, packaging stability, and labor reduction are key project objectives.

Vessels, Reactors, & Tanks

ASME Certified Capability

Section Overview

Tianjin Huabang designs and manufactures vessels, reactors, and tanks for fine-chemical and downstream-processing applications, supported by ASME-certified fabrication capabilities and multidisciplinary engineering coordination. These systems are positioned not only as stand-alone fabricated items, but as process-critical equipment within larger production and EPC packages.

The portfolio covers:

- reaction vessels
- storage and feed tanks
- jacketed and coil-equipped process vessels
- surge drums and receivers
- scrubber towers and associated circulation vessels
- skid-mounted tank and vessel modules
- instrumented process packages with PLC / DCS integration
- dust collection and local aspiration connections

Provision of engineering scope in process, piping, instrumentation, electrical, automation, and structural design, and support for integrated project delivery in both shop-fabricated and skid-mounted forms.

Product Positioning

Vessels and tanks are selected based on process pressure, temperature, material compatibility, agitation requirements, residence time, and control philosophy. Huabang's engineering approach emphasizes:

- code-compliant mechanical design
- practical process integration
- adaptability to corrosive and temperature-sensitive service
- instrumentation readiness
- ease of shop fabrication and field installation

This is especially relevant in fine-chemical applications where the vessel is not only a container, but a controlled thermal and reaction environment.

Product Families

Jacketed Process Vessels

For heating or cooling with steam, hot water, glycol, or thermal oil. Suitable for dissolution, controlled reaction, buffer holding, and temperature-conditioning duties.

Coil-Wound or Internal-Coil Vessels

For applications requiring an enhanced heat-transfer surface, improved temperature response, or more uniform thermal control within the vessel.

Agitated Reactors

For reaction, blending, or holding services with tailored agitation systems selected based on viscosity, phase behavior, and process objectives.

Storage Tanks and Day Tanks

For raw material, intermediate, and finished-product storage, including atmospheric or pressurized arrangements as required by the process.

Instrumented Process Modules

For skid-mounted systems that integrate vessel, pumps, valves, instruments, and local control hardware into a single packaged unit.

Key Technical Features

ASME-Certified Fabrication Capability
Pressure-boundary equipment can be designed and manufactured under ASME-based fabrication practice, supporting projects that require internationally recognized code compliance and documentation.

Flexible Thermal Design
Jackets, coils, and internal circulation arrangements are selected based on heating/cooling duty, media type, and required response speed.

Agitation Tailored to Process Effect
Agitator types may include anchor, paddle, turbine, pitched-blade, high-shear, or other specialized arrangements, depending on viscosity and mixing target.

Instrumentation-Ready Design
Vessels may be equipped with level, temperature, pressure, and density measurements, along with control valve interfaces and PLC/DCS connection points.

Skid-Mounted Execution
Where appropriate, vessels and tanks can be integrated into skid modules with local piping, instrumentation, valves, and electrical and structural support, reducing fieldwork and improving installation predictability.

Typical Configuration Options

- jacketed or non-jacketed shell
- internal coil arrangement
- top-entry or side-entry agitator
- atmospheric or pressure-rated design
- carbon steel, SS304, SS316L or project-specific metallurgy
- local control cabinet or DCS-ready signal interface
- skid base with piping and valve manifolds

Representative Selection Table

Model Group	Typical Volume Range	Typical Duty	Typical Configuration
JM-VJ-Series	0.5-20 m^3	heated / cooled process vessel	jacketed, insulated, instrumented
JM-VC-Series	1-30 m^3	higher thermal-duty vessel	internal coil or hybrid thermal design
JM-R-Series	0.5-50 m^3	reaction / mixing	agitated, instrumented, pressure-rated as required
AV-T-Series	1-200 m^3	storage / surge / day tank	atmospheric or low-pressure
SK-Series	project-specific	packaged process module	skid-mounted vessel system

The actual vessel design is confirmed in accordance with the process data sheet, design pressure/temperature, metallurgy, corrosion allowance, and code requirements.

Wet Dust Removal and Gas Cleaning Systems

Scrubber Systems for Chemical and Maleic-Anhydride Service

Section Overview

Huabang supplies wet gas-cleaning systems for dust, acidic gas, and process-vapor control in chemical production lines. These systems are particularly relevant in maleic anhydride and related organic chemical applications where wet scrubbing, absorption, and multi-stage gas-liquid contact are used to control emissions, protect downstream equipment, and improve plant cleanliness.

Product Positioning

Wet gas-cleaning systems are typically selected where one or more of the following apply:

- wet removal of soluble contaminants
- acidic or reactive gas components
- cooling and conditioning of process exhaust
- combined dust and vapor handling
- gas cleaning ahead of oxidation or further polishing steps

For maleic anhydride and related projects, the wet section is often configured as a multi-stage scrubber or absorption train to handle variations in process gas composition, temperature, and liquid chemistry in a controlled manner.

Product Families

- **single-stage packed scrubbers**
- **multi-stage packed scrubbers**
- **spray scrubbers**
- **Venturi pre-scrubbers**
- **circulation tanks and dosing modules**
- **mist eliminator sections**
- **scrubber skids with pumps, piping, and instrumentation**

Key Technical Features

Gas-Liquid Mass Transfer Design
Scrubbers are configured around contact efficiency, liquid distribution, packing performance, pressure drop, and residence time, with selection based on the target removal duty.

Multi-Stage Configuration for Chemical Service
For maleic anhydride and similar processes, the system may be arranged in multiple stages to separate rough conditioning, primary absorption, and polishing.

Integrated Monitoring and Control
Scrubber systems can include pH, temperature, level, flow, and pressure monitoring, along with dosing control, circulation pump logic, and alarm functions.

Materials for Corrosive Duty
Construction may be selected from FRP, lined carbon steel, or stainless steel, depending on chemistry, temperature, and lifecycle requirements.

Project-Packaged Supply
The wet gas-cleaning section can be delivered as stand-alone equipment or as a packaged skid with pumps, tank, piping, instruments, and structural frame.

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Representative Selection Table

Model Group	Typical Gas Flow Range	Typical Configuration	Typical Positioning
HB-WS-1	1,000-5,000 Nm^3/h	single-stage packed scrubber	compact local gas cleaning
HB-WS-2	5,000-20,000 Nm^3/h	two-stage scrubber	standard chemical duty
HB-WS-3	20,000-50,000 Nm^3/h	multi-stage scrubber with mist elimination	maleic-anhydride and larger process service
WS-SK	project-specific	skid-mounted scrubber package	modular EPC and retrofit execution

Actual sizing depends on gas composition, temperature, inlet loading, target outlet condition, absorbent chemistry, and allowable pressure drop.

Baghouse Dust Collectors

Section Overview

Huabang's HB-FMC baghouse dust collectors are pulse-jet dry-filtration systems for dust capture in flaking, conveying, packaging, and solids-transfer applications. The series is designed as a modular family with standardized filter-bag grouping and scalable housing sizes, enabling practical selection for both compact lines and larger industrial installations. The uploaded product data identifies the HB-FMC series as a core dry dust-removal line and details model groupings ranging from 24 to 160 bags, with airflow ranges of approximately 800 to 18,000 m3/h in the standard tables.

Product Positioning

The HB-FMC series is intended for:

- flaker discharge dust control
- packaging-line dust collection
- hopper venting and transfer-point aspiration
- screening and intermediate handling dust capture
- local dust collection in chemical solids service

The equipment can be supplied as hopper-bottom or flange-type execution, with optional ash-discharge and screw-conveyor arrangements.

Key Technical Features

Pulse-Jet Cleaning Principle
Compressed air is released through pulse valves into the filter-bag system, rapidly expanding the bags and dislodging accumulated dust, ensuring stable, long-term operation.

Modular Filter-Bag Architecture
The HB-FMC family is organized in standardized bag-count increments, simplifying selection and scaling.

Stable Filtration Efficiency
The series is intended for high dust-removal efficiency in dry-service applications, with filtration performance dependent on media choice, air-to-cloth ratio, and process conditions.

Adaptable Discharge Arrangement
Depending on project need, the baghouse may be supplied with a hopper, butterfly valve, ash discharge, or screw-conveyor configuration.

Safety and Monitoring Options
The system may include differential-pressure monitoring, dust-concentration monitoring, an explosion-relief interface, and automatic pulse-sequence control.

HBFMC Selection Table

Common design basis for the series

Filtration principle: pulse-jet baghouse

Execution: hopper type or open-flange type

Filter media: selected according to dust chemistry and temperature

Model Group	Filter Bag Count	Typical Airflow Range (m^3/h)	Typical Positioning
HB-FMC-24 to 48	24-48	800-5,400	compact flaker and packaging dust control
HB-FMC-56 to 96	56-96	2,000-10,800	standard industrial dust collection
HB-FMC-104 to 160	104-160	11,700-18,000	larger line and central aspiration duty
FMC-Custom	project-specific	above standard range	integrated line and EPC application

The uploaded product material also includes a specific reference case for phthalic-anhydride flake production and packaging lines, showing one-line to four-line baghouse arrangements with filter areas and airflow scaled to production-line count

Customization Options

- standard hopper-bottom or flange-bottom execution
- anti-static, water-repellent, or oil-repellent filter media
- explosion-relief and monitoring provisions
- screw conveyor or discharge valve
- pulse-controller and DP-based cleaning logic
- integrated fan and duct interface
- stainless-steel or lined contact section as required

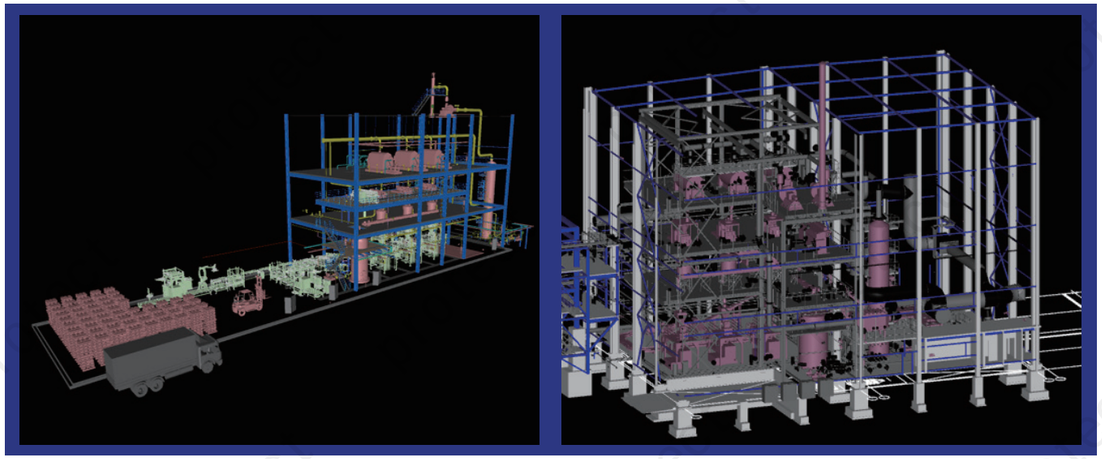
Integrated Fine-Chemical EPC Capability

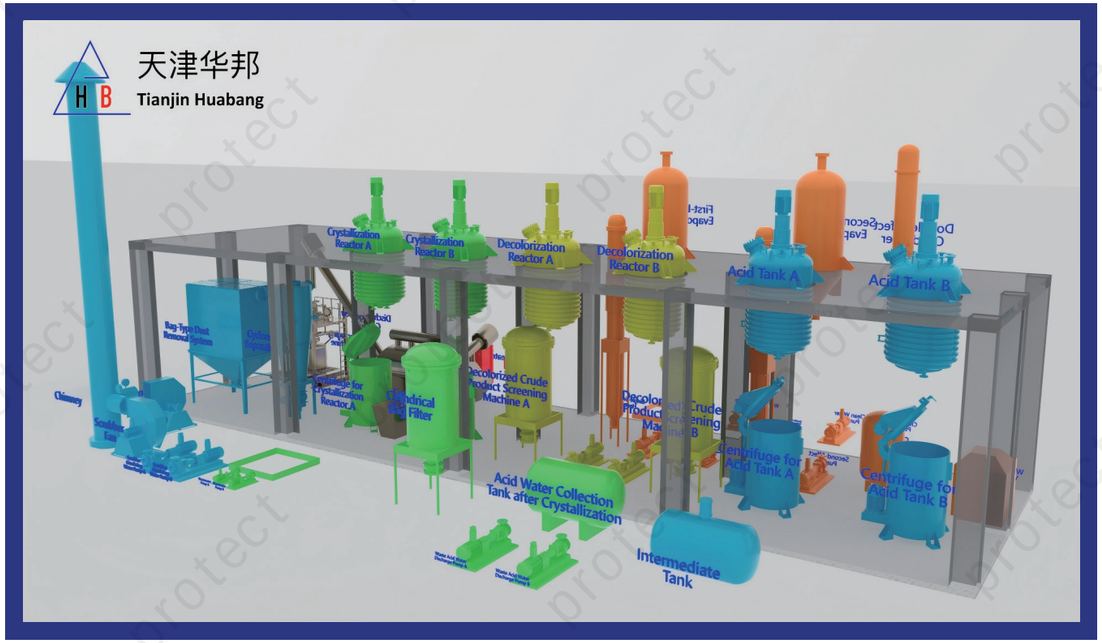
Section Overview

Across phthalic anhydride tail-gas treatment, phthalic-anhydride-derived plasticizers, fumaric acid, acrylic acid and benzoic acid projects, Huabang's EPC basis is built on one integrated engineering platform that combines process know-how with deliverable plant engineering.

Multidisciplinary Delivery Scope

- process know-how application
- process design package and basis of design
- equipment design and specification
- piping design and plant layout
- instrumentation and control-system engineering
- electrical engineering and power interface
- full automation architecture
- structural design and skid modularization, where practical
- procurement coordination and fabrication support
- site supervision, commissioning, and performance optimization





Common Engineering Strengths

Process-to-Equipment Continuity
The process package is developed with direct awareness of actual equipment fabrication, installation, and operating requirements.

Utility and Environmental Integration
Steam, cooling, emissions treatment, scrubbers, baghouses, and vent systems are incorporated as part of the full plant basis.

Modular Execution Where Practical
Selected process packages can be skid-mounted to reduce field work and improve overseas execution quality.

Downstream Finishing Integration
Where the product ends up as flakes, granules, or dry solids, Huabang can extend the EPC basis directly to the cooling, conveying, storage, and packaging sections.

Partner with Tianjin Huabang for the Next Generation of Fine-Chemical Production

Tianjin Huabang combines process know-how, equipment engineering, and project execution into one integrated platform for modern fine-chemical production. From reaction, oxidation, and tail-gas treatment to flaking, briquetting, granulation, conveying, packaging, and environmental control, our solutions are developed to operate as complete industrial systems rather than isolated pieces of equipment.

What distinguishes Huabang is not only the breadth of our portfolio, but the way we deliver it. We work backward from process objectives to equipment design, automation architecture, utility integration, and long-term operability. This allows us to provide clients with solutions that are technically robust, commercially practical, and ready for international deployment.

Our engineering and manufacturing capabilities support:

- turnkey process and equipment packages
- ASME-oriented vessel and equipment fabrication
- EPC and modularized skid-based delivery
- full automation and control integration
- downstream solids handling from melt to final packaging
- tail-gas treatment, wet scrubbing, and dust-control systems
- customized solutions for fine chemicals, anhydrides, and derivative products

EPC Basis for Phthalic-Anhydride Derivative Plasticizers

Section Overview

Building on its Phthalic-Anhydride process and downstream equipment capabilities, Tianjin Huabang also provides EPC-based engineering for phthalic anhydride-derived plasticizer production units, including the core reaction, finishing, storage, utility, and packaging sections. These projects are typically developed for clients requiring reliable esterification technology, consistent product quality, efficient heat management, and practical plant automation.

The plasticizer section is a natural extension of Huabang's capability in:

- phthalic-anhydride-related process engineering
- reactor and vessel design
- heat-transfer-intensive systems
- scrubbers and tail-gas treatment
- storage, conveying, and packaging integration
- EPC coordination across process, piping, instrumentation, electrical, and structural disciplines

Typical target products may include:

- DOP / DEHP (dioctyl phthalate / di(2-ethylhexyl) phthalate)
- DBP (dibutyl phthalate)
- DIBP (diisobutyl phthalate)
- DINP / DIDP-type phthalate plasticizers, where the project basis and licensing route allow
- other esterification-based phthalic-anhydride derivatives according to client product slate and market requirement

EPC Scope

The plasticizer EPC basis can include:

- process know-how application and basis of design
- reaction-route development for selected ester products
- esterification reactor-section engineering
- alcohol handling, storage, and metering systems
- catalyst dosing and recovery philosophy, where applicable
- water-removal and azeotropic separation design
- stripping, deodorization, and finishing sections

EPC Scope

The plasticizer EPC basis can include:

- vacuum-system engineering
- filtration and polishing systems
- finished-product cooling and storage
- additive dosing and blending systems where required
- loading, drumming, or bulk-transfer package
- scrubber, vent-condensing, and VOC-control systems
- piping, instrumentation, electrical, and full-automation design
- structural and skid-module design for packaged sub-units
- commissioning support, performance tuning, and operator training

Engineering Focus

Plasticizer plants based on phthalic anhydride are driven by the performance of the esterification and finishing trains. In practical EPC work, the engineering focus is usually placed on the following areas:

Reaction and Conversion Control

The esterification section must maintain stable stoichiometry, residence time, and temperature profile to achieve high conversion and consistent acid value. Reactor design, agitation, heat transfer, and alcohol circulation all strongly influence final product quality.

Water Removal and Equilibrium Management

Because esterification is an equilibrium-limited process, efficient removal of reaction water is essential. The EPC basis, therefore, places strong emphasis on overhead condensation, phase separation, reflux control, and, where applicable, vacuum-assisted finishing.

Product Color, Odor, and Purity

Commercial plasticizer quality is often judged by color, volatility, odor, and trace impurity profile. The finishing system may therefore incorporate vacuum stripping, polishing, filtration, carbon treatment, or other quality-conditioning steps, depending on product grade.

Thermal Efficiency and Utility Balance

Plasticizer production is heat-intensive but highly amenable to optimization. Integrated heating, condensation, and cooling utility design can improve both operating cost and product stability.

Safe Handling of Organics and Vapors

The plant must manage combustible organics, hot liquids, and esterification off-gas in a controlled way. Vent recovery, scrubbers, condensers, flame-safe routing, and electrical-area classification are therefore part of the engineering basis.

Key Technical Features

Esterification Reactor Platform
Huabang can develop the reactor train around jacketed or coil-equipped vessels, selected agitation patterns, staged feed logic, and controlled overhead removal. Reactor sizing and internals are adapted to the conversion target, viscosity profile, and selected alcohol system.

Integrated Water-Removal Section
The overhead system may include a condenser, a phase separator, a reflux arrangement, and a water draw-off logic to maintain reaction progress and protect product quality.

Vacuum and Finishing Integration
Where lower residual volatiles, better odor profile, or higher product stability are required, the line can incorporate vacuum finishing, stripping, and polishing steps.

Storage and Transfer Engineering
The EPC basis includes alcohol storage, intermediate circulation, finished-product tankage, pumping and loading arrangements with instrumentation and interlocks.

Environmental Control
The package can incorporate scrubbers, condensers, and VOC management sections for reactor vents, tank breathing, and product finishing services.

Representative Project Classes

Project Class	Typical Positioning	Core Sections
HB-PL-S	compact single-product line	esterification, separation, storage
HB-PL-M	standard industrial unit	reaction, finishing, utilities, loading
HB-PL-FLEX	multi-product plasticizer train	reaction, blending, tank farm, control
PL-EPC	full EPC package	process, utilities, storage, environmental, automation

EPC Basis for Tail-Gas Treatment for Phthalic Anhydride (PA)

Full Project Supply

Section Overview

Tianjin Huabang provides EPC-based tail-gas treatment packages for phthalic anhydride production units, integrating catalytic oxidation, heat recovery, process control, and utility integration into a complete engineered environmental and energy-recovery system. This package is not treated as an isolated add-on, but as an essential process-support unit that must operate in balance with the main PA plant.
Huabang supplies catalytic oxidation units utilizing BASF catalysts and affirms its position as the exclusive equipment partner with BASF in Asia Pacific for PA tail-gas catalysts, having jointly delivered over 20 units to date.

EPC Scope

The PA tail-gas EPC basis can include:

- process know-how application and process-design basis
- tail-gas characterization and operating-envelope definition
- basic process design package and heat / material balance
- gas-collection and tie-in philosophy from the main PA unit
- gas distributor and flow-equalization design
- preheater, gas-gas heat exchanger, and thermal integration design
- catalytic oxidation reactor and catalyst loading basis
- waste-heat boiler and steam-generation section
- bypass, start-up heating, and warm-up logic
- stack, vent, and emissions-monitoring interface
- piping design, stress interface, and expansion philosophy
- instrumented safeguarding and interlock architecture
- electrical design, MCC interface, and power distribution
- DCS / PLC-based full automation and sequence logic
- structural steel, platform, and skid / modular arrangement where practical
- procurement support, fabrication coordination, site supervision, and commissioning support

Engineering Focus

Catalytic Oxidation Performance

The core duty is stable destruction of VOCs and CO without introducing excessive pressure drop or causing catalyst damage under changing gas composition.

Thermal Self-Sustainability

Where tail-gas composition permits, the oxidation section can be designed to recover sufficient reaction heat to support steam generation and reduce net utility burden.

Reliable Start-Up and Turn-Down Operation

Tail-gas units must handle warm-up, low-load operation, and composition fluctuation without thermal shock or unstable reactor conditions. Start-up heaters, bypasses, and interlocks are therefore part of the engineering basis.

Protection of Catalyst and Equipment

Temperature control, contaminant management, flow distribution, and emergency logic must all be designed to extend catalyst life and avoid overheating or localized hot spots.

Integration with the Main Plant

The tail-gas unit must be engineered so it does not disturb upstream oxidation and recovery sections. Hydraulic balance, backpressure stability, and control logic are therefore essential.

Key Technical Features

Catalytic Oxidation Reactor Package
The reactor section is engineered around catalyst performance, gas distribution, thermal uniformity, and maintainability.

Waste-Heat Recovery and Steam Utilization
Recovered heat can be directed into steam generation and utility integration, turning the environmental unit into an energy-contributing process asset.

Instrumented Temperature and Pressure Control
Multi-point monitoring and interlocks are used to manage bed temperature, protect the catalyst, and maintain a safe operating range.

Integrated EPC Delivery
The package can be delivered with process, mechanical, piping, electrical, automation, and structural scopes on a coordinated-execution basis.

Representative Project Classes

Project Class	Typical Tail-Gas Capacity	Typical Positioning
HB-PA-TG-20	20,000 Nm^3/h	compact PA tail-gas unit
HB-PA-TG-40	40,000 Nm^3/h	standard industrial PA line
HB-PA-TG-80	80,000 Nm^3/h	large-capacity production plant
HB-PA-TG-100/120	100,000-120,000 Nm^3/h	large integrated PA complex

EPC Basis for Fumaric Acid

Section Overview

Huabang provides EPC and process-package capabilities for fumaric acid production units, including reaction, conversion, concentration, crystallization support, evaporation, solids finishing, and utility integration. In these projects, the engineering challenge extends beyond equipment supply; it lies in integrating liquid-phase process control, impurity management, evaporation efficiency, and downstream solid handling into a stable, cost-effective plant design.

EPC Scope

The fumaric-acid EPC basis can include:

- process basis and product-grade definition
- route evaluation and process-package preparation
- reaction and conversion section design
- liquor concentration and multi-stage evaporation design
- crystallization and slurry-handling interface
- solid-liquid separation support
- mother-liquor recycle and purge logic
- impurity-control and heavy-metal management philosophy
- drying, cooling, and downstream solids finishing
- storage, conveying, and packaging integration
- utility, condensate, and wastewater interface design
- piping, instrumentation, electrical, and automation engineering
- structural and skid-module design for selected process packages
- site commissioning, optimization, and start-up support

Engineering Focus

Evaporation and Concentration Efficiency

Fumaric-acid projects often depend heavily on the economics and operability of the evaporation section. The number of stages, recirculation logic, and fouling tolerance must be balanced against utility cost and capital cost.

Crystallization and Solid Recovery

Downstream recovery must be engineered to obtain product yield, manageable crystal habit, and practical separation performance without excessive fines generation.

Impurity and Product-Grade Control

Product quality may be affected by metal ions, color bodies, organic carryover, and impurities from recycling. The process basis, therefore, includes impurity-path analysis and purge / polishing logic where needed.

Liquor Handling and Fouling Management

Because fumaric-acid systems can be solids-forming and concentration-sensitive, line routing, circulation rate, and cleaning philosophy are important parts of the EPC scope.

Downstream Dry Solids Integration

Drying, cooling, conveying, and packaging must be matched to the product's crystalline behavior and the final customer specifications.

Key Technical Features

Integrated Crystallization and Separation Basis
The process package can include the interface between concentration, crystallization, solid recovery, and recycle balance rather than treating each section independently.

Impurity-Control Engineering
The EPC basis can incorporate feed-quality control, metallurgy selection, filtration logic, and purge strategy to protect final product quality.

Strong Solids-Handling Continuity
The line can extend directly into cooling, conveying, and packaging for a complete production-to-dispatch route.

Representative Project Classes

Project Class	Typical Positioning	Core Sections
HB-FA-S	compact fumaric-acid unit	reaction, evaporation, recovery
HB-FA-M	standard industrial line	reaction, evaporation, solids finishing
HB-FA-Q	quality-focused line	impurity control, polishing, packaged solids handling
FA-EPC	full EPC package	multidisciplinary full-plant execution

Internal exchange with a fumaric-acid customer also reflects Huabang's support on heavy-metal-related quality issues in fumaric acid, showing process-depth engagement beyond simple equipment quotation

EPC Basis for Acrylic Acid

Section Overview

Huabang provides engineering and project-package capabilities for acrylic acid-related process facilities, especially in oxidation-section equipment, heat-removal systems, gas-handling, recovery support, environmental integration, and plant-wide automation. Acrylic acid plants are technically demanding because they involve a highly exothermic reaction, corrosive service conditions, tight temperature control, and strict environmental requirements.
The engineering basis is therefore developed around stable oxidation performance, high thermal reliability, safe vapor handling, and practical maintainability across the full plant.

EPC Scope

The acrylic-acid EPC basis can include:

- basis of design and process-package development
- oxidation-section engineering and reactor interface support
- heat-removal and thermal-circulation system design
- feed preparation and gas-handling engineering
- absorber, condenser, and recovery-section support
- purification and heavy-ends handling interface
- tail-gas collection and treatment integration
- utility balance, heat recovery, and steam interface
- piping, instrumentation, and process-control engineering
- electrical design, analyzer integration, and automation architecture
- structural steel and skid design for selected packages
- site engineering, commissioning, and performance tuning support

Engineering Focus

Highly Exothermic Oxidation Duty

Acrylic-acid-related oxidation systems require precise heat removal and stable temperature profile management to maintain catalyst performance and protect selectivity.

Corrosion and Materials Selection

Reactive organics, acidic components, and condensable species require careful metallurgy and corrosion management planning across gas, liquid, and condensate systems.

Recovery and Purification Stability

The recovery train must be engineered to limit losses, control polymerization risk, and maintain safe operating windows in condensers, absorbers, and purification equipment.

Environmental and Safety Integration

Acrylic acid projects place significant demands on vent handling, off-gas treatment, monitoring, and emergency logic.

Automation Depth

Due to process sensitivity, acrylic acid plants benefit from higher automation density, continuous monitoring, and robust operator support logic.

Key Technical Features

Oxidation-Section Design Support
The package can be developed around high-duty reactor service, heat removal, and circulation stability.

Integrated Recovery Philosophy
Absorption, condensation, and purification interfaces are treated as part of one continuous process path.

Polymerization-Aware Engineering
Where relevant, the design basis can incorporate inhibitor management, temperature control, and equipment-drainability considerations.

Full-Automation Package
The automation scope may include sequence control, analyzer inputs, interlocks, historian logic, and integrated alarm philosophy.

Representative Project Classes

Project Class	Typical Positioning	Core Sections
HB-AA-Unit	oxidation and recovery sub-unit	oxidation, heat removal, gas handling
HB-AA-M	standard acrylic-acid facility basis	process, utilities, environmental sections
HB-AA-AUTO	advanced automation package	integrated control and monitoring architecture
AA-EPC	full EPC package	multidisciplinary plant delivery

EPC Basis for Benzoic Acid

Section Overview

Huabang provides EPC-based engineering for benzoic acid production systems, including reaction and oxidation sections, crystallization / separation, product finishing, environmental control, and downstream solids handling. Benzoic acid projects require a balanced approach: reaction and heat removal performance are important, but plant value is also determined by crystal quality, separation stability, product finishing, and packaging readiness.

EPC Scope

The benzoic-acid EPC basis can include:

- process know-how application and design basis
- reaction / oxidation section engineering
- feed preparation and reaction thermal control
- crystallization and cooling-section support
- solid-liquid separation interface
- washing, drying, and polishing basis
- finished-product conveying, storage, and packaging integration
- vent, scrubber, and dust-control systems
- piping, instrumentation, electrical, and automation design
- structural and skid design for modular units
- commissioning, start-up optimization, and operator training support

Engineering Focus

Reaction-to-Crystal Continuity

The engineering basis must connect upstream reaction performance to downstream crystallization behavior and the practicality of separation.

Crystal Quality and Recovery

Benzoic acid economics are strongly influenced by product habit, solids-handling behavior, and recovery yield.

Drying and Finishing Practicality

The finishing train must deliver a saleable product with manageable moisture, good flowability, and suitable packaging behavior.

Environmental and Handling Cleanliness

Vent treatment, scrubber interface, and dust-control measures are essential, particularly in packaged and dried-product areas.

Compact Modularization Potential

Many support sections can be modularized to reduce on-site erection and clarify battery limits.

Key Technical Features

Integrated Reaction and Crystallization Basis
The EPC scope can be built around the link between conversion, cooling profile, and product crystal formation.

Downstream Solids-Handling Strength
Huabang's broader flaking, conveying, and packaging platform supports a practical end-of-line solution for benzoic-acid plants.

Vent and Dust Management
The package can include wet and dry environmental systems matched to reaction vents, dryer vents, and solids transfer points.

Flexible Packaging Interface
The line can discharge to small bags, ton bags, or bulk storage depending on product and market requirements.

Representative Project Classes

Project Class	Typical Positioning	Core Sections
HB-BA-S	compact benzoic-acid unit	reaction, separation, solids finishing
HB-BA-M	standard industrial line	crystallization, drying, packaging
HB-BA-CLEAN	high-cleanliness handling line	dust control, packaging, enclosed transfer
BA-EPC	full EPC package	multidisciplinary integrated project

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Tianjin Huabang New Materials Technology Co., Ltd.

Technology-Led Process and Equipment Solutions for the Fine Chemicals Industry

Across international projects, we have demonstrated the ability to translate complex process requirements into reliable industrial operation. Whether the need is a single machine, a modular production section, or a fully integrated plant package, Huabang delivers with the same focus on engineering discipline, safety, maintainability, and lifecycle value.

If you are evaluating new production capacity, plant upgrades, environmental compliance projects, or integrated solids-handling solutions, Tianjin Huabang is ready to support your project from concept to commissioning.