KPD-SERIES

EXTRACTION PLANTS

A LETTER FROM THE FOUNDER

It is with deep appreciation to our valued customers the Precision Extraction Solutions has grown to be the industry leader in cannabis and hemp extraction equipment, training and consulting.

We pride ourselves on our ability to deliver the highest quality products and services in the industry. Our team's innovative spirit, coupled with our company-wide commitment to customer success, has propelled Precision forward. Performance is driven by people, and I truly believe that the Precision team of professionals is made up of the best people you will find.

Precision extraction systems are world-renowned for quality, safety and precise operation. Costing half of comparable CO2 systems, with nine times more efficient processing, more award-winning concentrates are made with Precision than any other brand.

Precision patent-pending equipment is certified for use in all regulated jurisdictions and fully compliant for Class 1, Division 1 environments. With unparalleled tech support and customer service, Precision is the world's only premier provider of extraction labs. From site-planning to build-out and equipping your lab, we make the regulatory process easy to navigate.

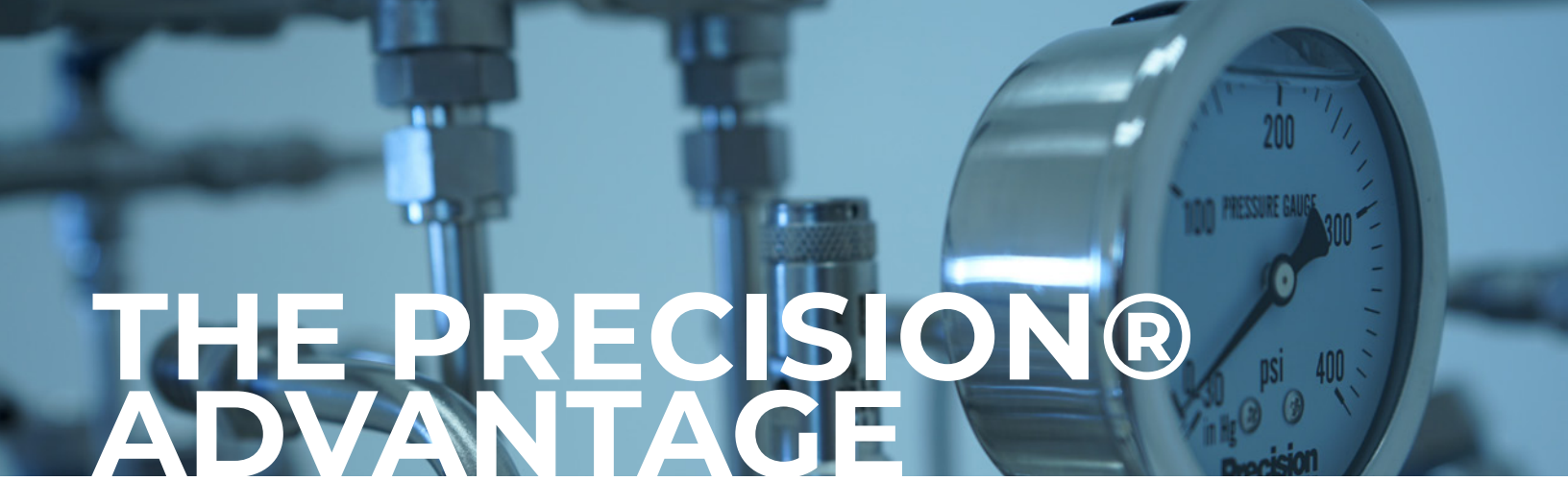
Precision engineers to strive to stay ahead of the curve, continually innovating and experimenting with new design methods whilst predicting future essentials within the industry. As industrial production expands, so does the mind-set of our development team, which is focused on overcoming physical and technological obstacles for our customers.

Recently introduced, the KPD series is a stellar example of Precision's state-of-the-art capabilities that surpass all industry standards. Industrial production for our customers is no longer out of reach.

It has been our pleasure to provide you with the very best in quality products, customer service and technical support. We look forward to continually challenging ourselves to deliver even more to our customers.

Our professional extraction experts are ready to assist you toward your boundless success in the cannabis and hemp extraction industry.

Nicholas Tennant
Founder, Precision Extraction Solutions



THE PRECISION® ADVANTAGE

With industry leading experience and customer service, Precision commits itself to the success of its customers. A number of things that we do that differentiate us from our competitors are:

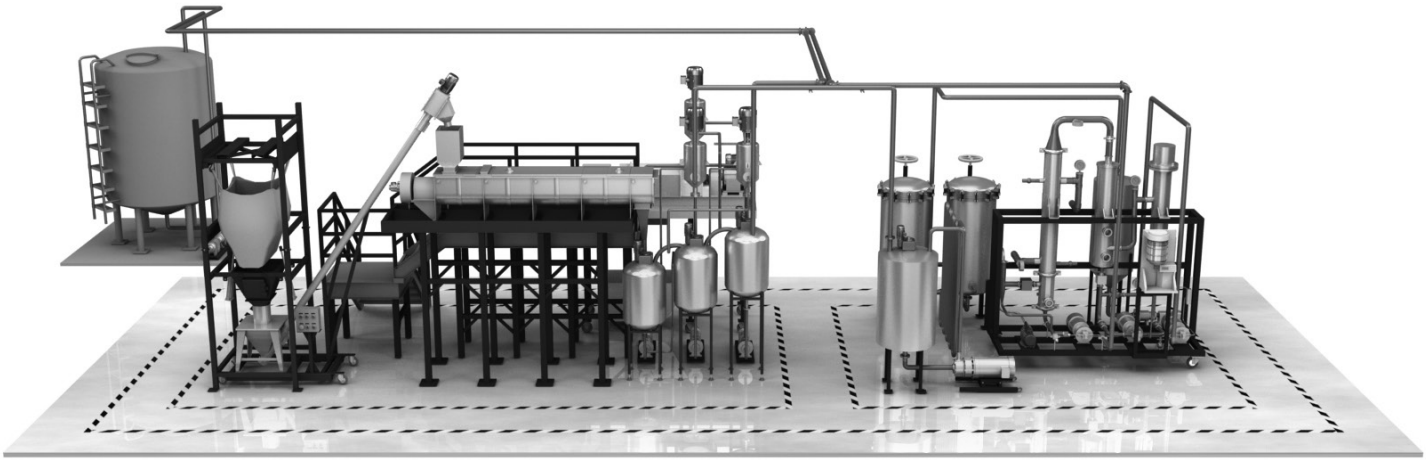
- ☑ **Key vendor partnerships in all industry sectors**
- ☑ **Over 500 successful installations of Precision equipment worldwide**
- ☑ **Extensive engineering, product and process experience**
- ☑ **Exclusive partnership with AMG engineering**
- ☑ **Industry leading cannabis and hemp process experts**
- ☑ **Lowest operational expense cost in the industry**
- ☑ **“Hot Stocked” spare parts to minimize potential downtime**
- ☑ **Dedicated project manager on all KPD projects**
- ☑ **A proven track record of success among the world’s top extraction companies**
- ☑ **Precision is your strategic technology partner via the OpX package**
- ☑ **Dedicated maintenance and support team via the Maintenance and Support Package**

EXTRACTION PLANT
KPD-SERIES

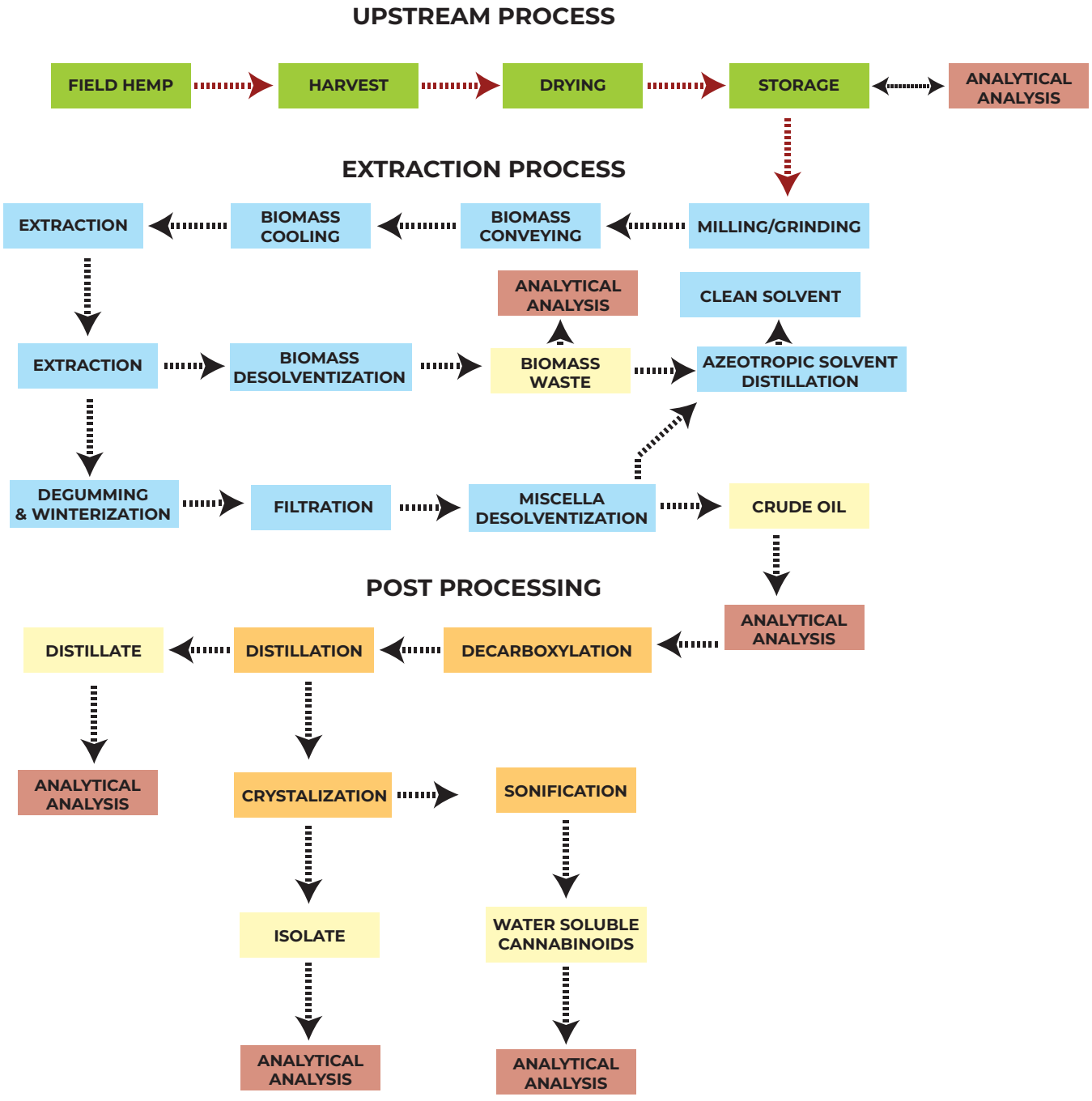
OVERVIEW

The KPD series of extractor designs are sized from 500 to 50,000 pounds of input biomass processing per day. Our team has made great efforts to make the complexed process of industrial extraction simple, with biomass in one end and finished product out the other end. With full PLC automation, the KPD series of extractors are extremely easy to operate and can be custom configured to make a variety of products. Additional backend processing on the KPD series adds versatility and the ability to make isolate and distillate products. Whatever your processing range and desired end product, Precision offers a solution.

Standard KPD plants are built for full end-to-end processing and include everything from the material milling to final crystallization. Please see deliverables.



GENERAL PROCESS MAP



UPSTREAM PROCESS KNOW-HOW

FIELD HEMP

Field grown hemp presents unique challenges and tremendous opportunities. With Precision, you are selecting a vendor partner that understands your extraction process starts in the field. Our team is able to give general assessment and guidelines starting from the field in order to optimize your extraction process. Even minor improvements in the field can result in a drastic increase in profitability of your KPD extractor.

Optimization of genetics and growing techniques are utilized for optimal extraction.

HARVEST

The strategic harvesting plan for large amounts of biomass is paramount for a efficient and smooth extraction operation process. Precision's team of experts are well versed in the methodologies and processes when it comes to material preparation and harvesting prior to extraction. We work closely with our clients to ensure that all processes are optimized for a complete and profitable extraction.

Combine harvesting and compression bailing are used in this process.

STORAGE

Oxidation, moisture, mildew, and pests can eat into your profits and cause serious disruptions in downstream extraction processing. Precision has the know-how and vendor partner relationships to ensure that your material storage methods and procedure are optimized for your KPD extractor.

Pelletization, compression bailing, and nitrogen sweeping may all be used in this process.

DRYING

Drying is an essential upstream process to minimize cannabinoid degradation. Like all our upstream processes, the team at Precision understands what it takes to optimize a large volume drying process and provides guidance to its client base.

Product is dried to <8% moisture content

ANALYTICAL ANALYSIS

Analytical analysis is paramount to optimize performance of your KPD extraction system. It is highly recommended that analytical equipment be onsite in order to gather data logging. Through its selected vendor partners, Precision can provide general guidance and know-how on what is needed and how to optimize the analytical process.

Multiple methologies including HPLC are utilized.

EXTRACTION

The KPD-series extraction plants are a turn-key solution for the extraction of cannabinoids, terpenes, and other desirable plant compounds from the hemp and cannabis plant. The systems may process from 500 – 50,000 kilograms per day of raw input material. The KPD-series extraction plants use counter current solvent based extraction, secondary filtration, and final wiped film distillation all which are described in further process detail within this document. The KPD-series extraction plants provide industrial scale processing while still meeting reasonable budgetary and lead time requirements, making it ideal for processors looking to scale operations.

A. MILLING/SHREDDING

Milling and shredding is obtained via a shredder capable of grinding flower, seed, stalk, up to the consistency of a fine powder. This is a tried and proven technology for large scale material preparation.

B. MATERIAL CONVEYING

Once milled to an optimized size (proprietary specifications), the biomass is be transported via a screw conveyor to a material cooling conveyor. Screw conveyors can be customized in order to meet the needs of certain buildings and transportation requirements.

C. MATERIAL COOLING

Material is cooled to specification via a cooling screw conveyor. This is particularly important in order to keep the solvent temperature stable and not add heat to the extraction process.

D. EXTRACTION

Extraction is preformed via a series of ethanol based slurry counter current extraction. Specific temperatures and biomass to ethanol ratios are utilized to extract 99%+ of all cannabinoids within the biomass. Biomass then undergoes a first separation from the solvent via a rotary strainer.

E. DESOLVENTIZATION

Biomass is desolventized in a two stage process once separated from the majority of the solvent. In the first step, a heated screw press is utilized to bring the biomass solvent levels down to a low targeted level. Once pressed the biomass is transferred to a secondary desolventizer where heat is applied to vaporize any residual ethanol in the biomass and bring the overall solvent loss content to <1%. Solvent vapors from the biomass desolventization are then re-condensed and reclaimed.

F. WASTE BIOMASS

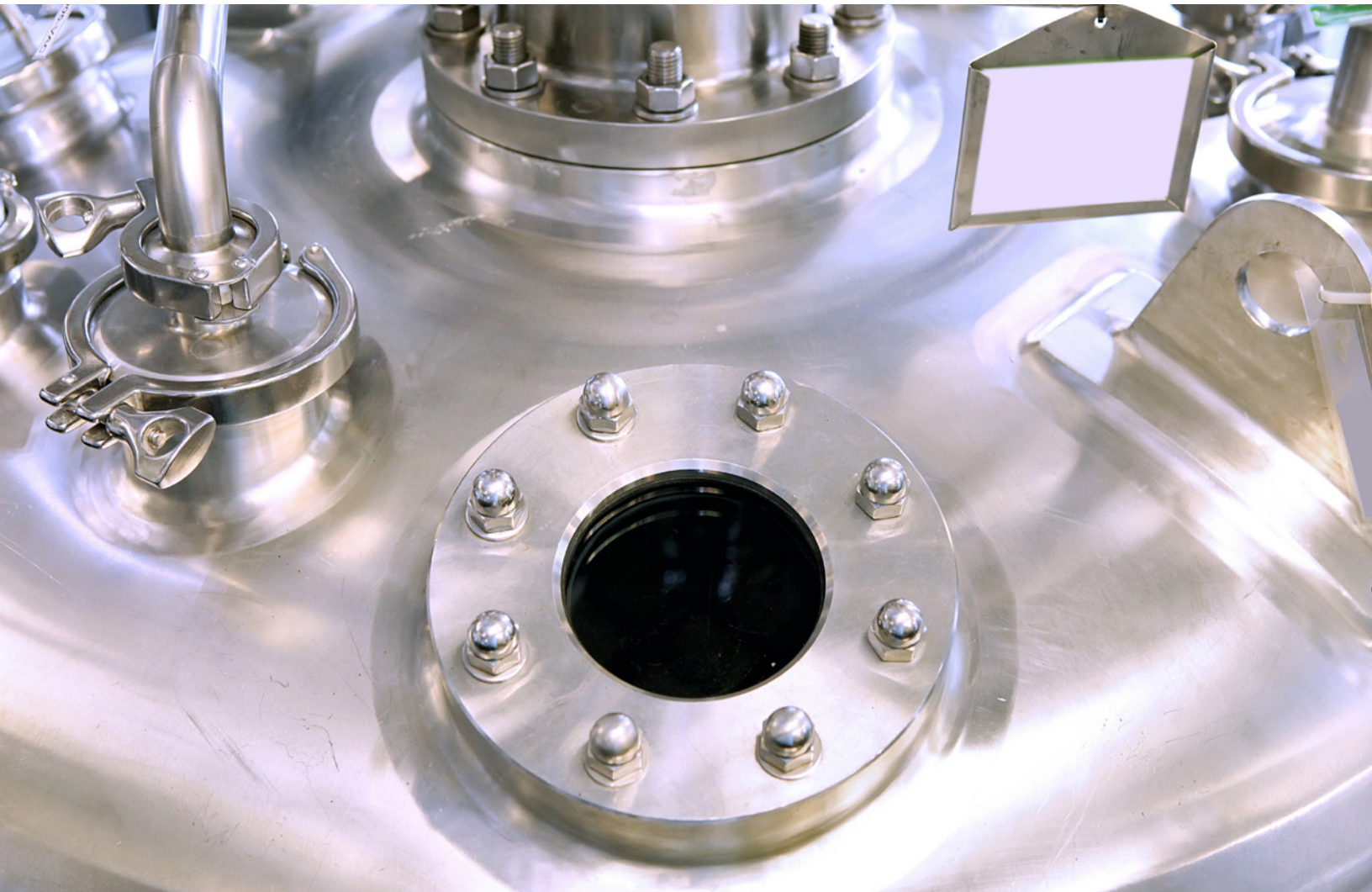
The end waste biomass from the process can be transported out of the building and resold for hog feed, fire logs, concrete, etc.

G. FILTRATION

Once extracted, biomass fines are decolored and filtered before solvent evaporation.

H. MISCELLA TRANSFERRING

Once filtered, the miscella (oil and solvent) is transferred to a staging tank.



I. DESOLVENTIZATION

The miscella is then desolventized to <1.5% residual solvent levels within the first stage of desolventization via a rising film evaporator. A second stage evaporation is utilized in order to remove the remaining solvent.

J. DEWATERING (AZEOTROPIC DISTILLATION)

Because of the homogeneous azeotropic nature of ethanol and water, a post process azeotropic distillation is used in order to “re-proof” the solvent and minimize losses and operational cost

K. DECARBOXYLATION

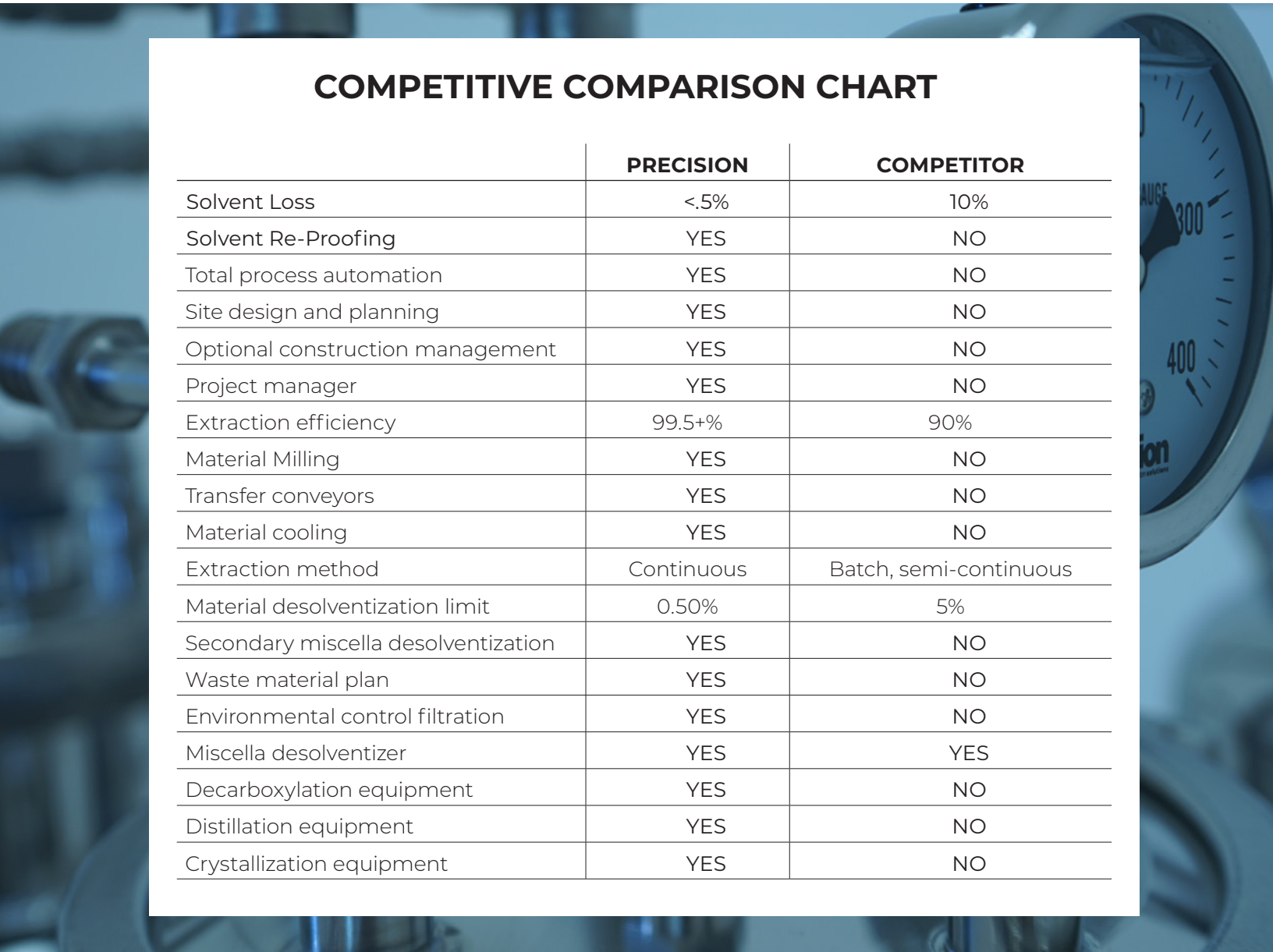
Once crude oil has been desolventized, a decarboxylation step is utilized prior to extraction.

L. DISTILLATION

Crude oil is then distilled via a dual stage wiped film evaporator, bringing the purity to above 85% and rendering a refined, gold like color.

M. CRYSTALLIZATION

Crystallization is preformed via a secondary solvent and reactionary vessel and desolventized via vacuum drying ovens.



COMPETITIVE COMPARISON CHART

	PRECISION	COMPETITOR
Solvent Loss	<.5%	10%
Solvent Re-Proofing	YES	NO
Total process automation	YES	NO
Site design and planning	YES	NO
Optional construction management	YES	NO
Project manager	YES	NO
Extraction efficiency	99.5+%	90%
Material Milling	YES	NO
Transfer conveyors	YES	NO
Material cooling	YES	NO
Extraction method	Continuous	Batch, semi-continuous
Material desolventization limit	0.50%	5%
Secondary miscella desolventization	YES	NO
Waste material plan	YES	NO
Environmental control filtration	YES	NO
Miscella desolventizer	YES	YES
Decarboxylation equipment	YES	NO
Distillation equipment	YES	NO
Crystallization equipment	YES	NO

STANDARD KPD BUILD EQUIPMENT DELIVERABLES

All equipment sizing and load balanced are right sized based upon the KPD selected throughput.

The standard KPD build comes with all of the following equipment for a true turn key solution to you industrial processing needs

- ☑ **Solvent storage tank (s)**
- ☑ **Hammer mill/biomass shredder**
- ☑ **Material conveyor (hammer mill to material cooling conveyor)**
- ☑ **Material cooling conveyor screw**
- ☑ **Material cooling chiller**
- ☑ **Solvent cooling chiller**
- ☑ **All process piping**
- ☑ **Process automation controls**
- ☑ **Extraction vessels, pumps, and strainers**
- ☑ **Desolventizing heated screw press**
- ☑ **Paddle desolventizer**
- ☑ **Desolventizing condenser**
- ☑ **Mineral oil environmental filtration**
- ☑ **Miscella carbon/DE filter**
- ☑ **Ethanol evaporator staging tank**
- ☑ **Rising film ethanol evaporator**
- ☑ **Secondary miscella evaporator**
- ☑ **Decarboxylation staging tank***
- ☑ **Dual stage wiped film evaporator**
- ☑ **Crystallization reactionary vessels**
- ☑ **Rotary evaporator or rising film evaporator for crystallization solvents**
- ☑ **Vacuum drying ovens for crystalline/isolate**
- ☑ **Full design and MEP drawings**

PROJECT ENGAGEMENT PROCESS

A statement of work, along with quotation, shall be provided to the client before the time of financial engagement. Any modifications to the statement of work shall be agreed upon in writing by both parties prior to financial engagement.

Any difference in requested by client outside the scope of work will require an engineering change order.

GMP COMPLIANCE

At the clients request in advance, a GMP compliant KPD extractor can be designed and specified. Quotation of a GMP compliant KPD extractor requires engagement in FEL (see payment terms below).

PAYMENT TERMS AND CONDITIONS | 500 – 1500 KPD

For KPD series extractors ranging from 500-1,500kg/day of input material processing the payment terms are as follows

50% down to begin project, 25% within 60 days, 25% upon equipment shipment

PAYMENT TERMS AND CONDITIONS
GREATER THAN 1,500KG/DAY

For KPD series extractors greater than 1500kg/day of processing capacity, an initial retainer shall be placed in order to complete FEL (front end loading process) which is equal to 5% of the overall rough project cost.

Front-End Loading (FEL) is staged-gate process where Precision develops a definition of the scope and cost of a capital project to meet our clients' business objectives. The engineering hours spent during each phase of FEL vary widely between small and large projects. Deliverables are as follows:

- ☑ **Strategic Business Assessment and Risks**
- ☑ **Technology Selection**
- ☑ **Potential Sites Identified**
- ☑ **Block Flow Diagrams**
- ☑ **Long Lead Equipment Identified**
- ☑ **Overall Project Execution Strategy**
- ☑ **Permitting & Regulatory Compliance Plan**
- ☑ **Process and Utility Flow Diagrams For Selected Option(s)**
- ☑ **Preliminary Sized Equipment List and Specifications**
- ☑ **Process Hazards Analysis Report**
- ☑ **Completed Environment Permit Submittal**
- ☑ **Training, Commissioning & Startup Plans**
- ☑ **Cost Estimate (+/- 10 %)**
- ☑ **Finalized Utility Flow Diagrams & Balances**
- ☑ **P&ID's - Issue IPL (Issue For Plant Layout)**
- ☑ **Plot plans & Critical Equipment Layouts**
- ☑ **Equipment List & Equipment Datasheets**
- ☑ **Single-line Electrical Diagrams**
- ☑ **Pre-Design Hazard Review**
- ☑ **Conceptual facility plan**
- ☑ **Equipment renderings**
- ☑ **Facility renderings**

GENERAL UTILITIES

The approximate power consumption of the for the KPD series of extractors is approximately 210KW for every 1000kg per day processed. Care should be taken when selecting a site for installation. The site must have, or be convertible to 480V 3 phase power. Please see the below chart to determine the power needs for your ideal KPD extractor size.

BUILDING REQUIREMENTS AND GUIDELINES

It is required that the building be at least 10,000 sq. ft. per 1000kg of processing to allow for machinery, biomass delivery and storage, packaging, workspace and other business activities.

WORK AREA CLASSIFICATIONS AND CONSTRUCTION

Depending on the jurisdiction and solvent type, work place areas that contain solvent will be classified as Class 1, Division 2 or Class 1, Division 1. This may require additional fire protection measure such as sprinklers and fire walls. It is highly recommended that a preinstalled fire suppression (e.g., sprinkler system) building be selected when considering a site.

INITIAL CODE INTERPRETATION (APPROXIMATELY 2-3 WEEKS)

A state licensed Fire Protection Engineering must prepare a report on the equipment and the building prior to application for permitting or installation. This is imperative to ensure compliance with all local, state, and national codes.

PERMITTING

Permitting may vary depending on region. It is recommended that all permitting be considered in an initial code interpretation and due diligence phase. Permits needed may include but not be limited to:

- Operational permit
- State licensing
- Environmental clean air permit

SITE PREPARATION

It is the client's responsibility to ensure that the project site has been properly prepared for the installation of equipment. Permitted construction drawings must be created and the site must be adequately prepared for equipment installation to the satisfaction of Precision® Extraction Solutions.

INSTALLATION

Installation is included with purchase and will include all equipment setting and pipe fitting in order to make the system operational.

MEP, at customers expense, must be designed, installed and completed to the satisfaction of Precision® prior to installation.

CONSUMABLES

Precision® Extraction Solutions will provide all necessary consumable items required to operate the plant with the exception of solvent. Via its network of distributors, Precision® can provide all maintenance items and filter media including but not limited to:

- Seals
- Gaskets
- Filter media (Diatomaceous Earth, Carbon, Citric Acid, bleaching clay, etc.)
- Steel treatments
- Filter cloths
- Resins

TRAINING

Training for operators shall take place onsite once the equipment has fully been installed and commissioned by the installers. Training onsite shall take no less than 7 days and no more than 30 days. Sufficient quantity of biomass must be provided by the client and available for all training periods.

OpX

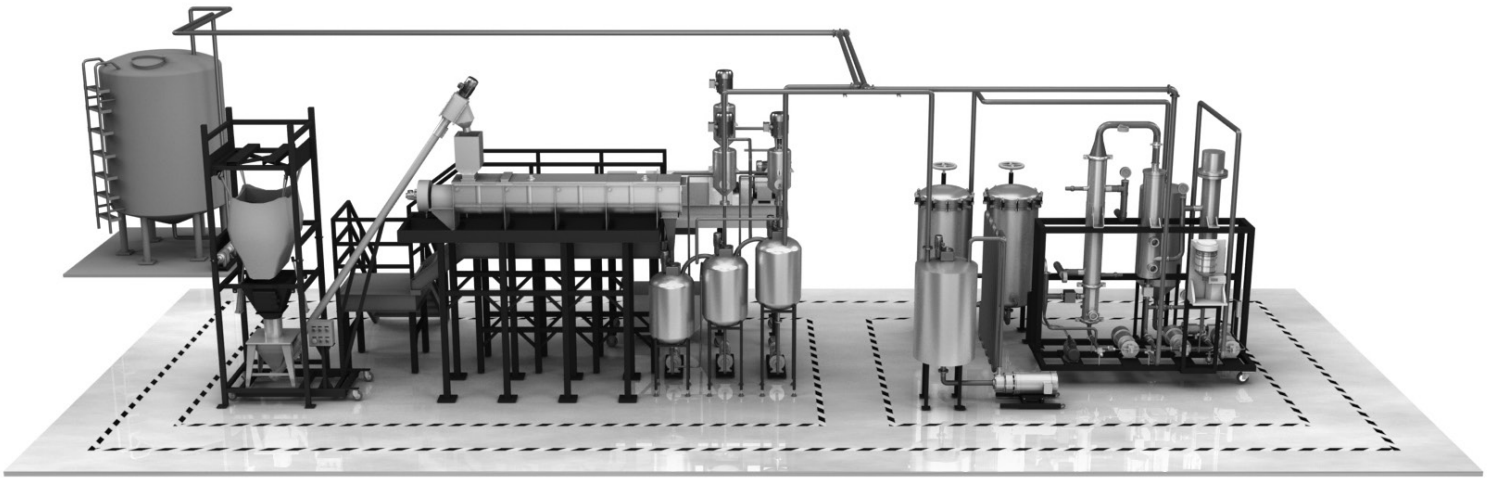
OPERATIONAL EXCELLENCE

PERFORMANCE PACKAGE

VIA VALUE ADD TECHNOLOGY LICENSE

Get your project started off right with Precision® Development Group managing your KPD's site development, due diligence, engineering and permitting. After installation and training, Precision® Extraction Solutions will work directly with you to drive operational excellence by increasing uptime, optimizing efficiencies and delivering peak performance with maximum yields.

Specifically designed for the KPD-series of industrial extraction equipment, Precision® is your strategic technology partner. From concept to completion – and beyond – your success is our success.



PHASE I

PHASE I: DESIGN & DEVELOPMENT

CODE ANALYSIS/INITIAL DUE DILIGENCE

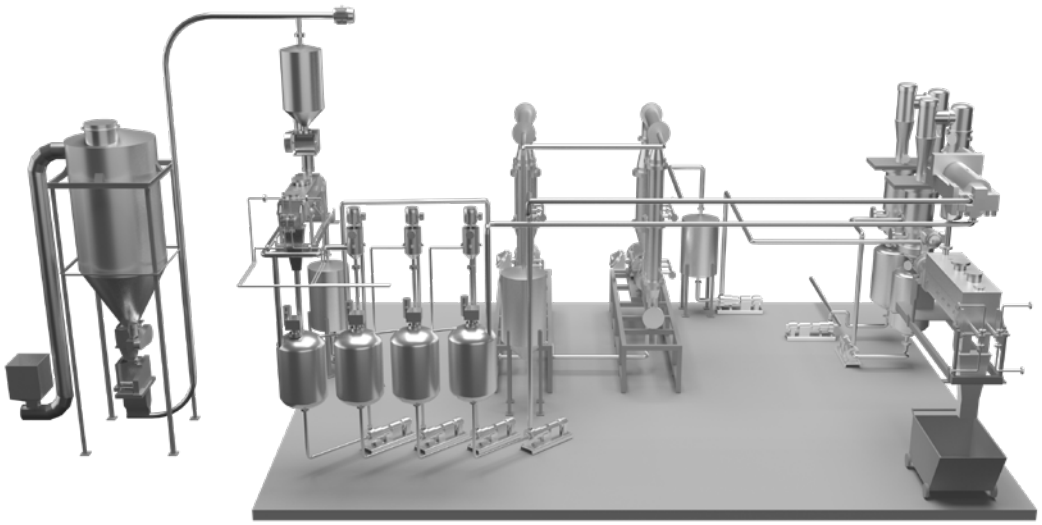
- Code analysis report
- Zoning report
- Use group identification
- Building occupancy
- Parking requirements
- ADA compliance
- Fire safety requirement report
- Gas storage location and requirements report

DEVELOPMENT ENGINEERING I

- Cover sheet with key plan and project data
- Existing MEP conditions report
- Code compliance and zoning report
- Full conceptual site plan
- Floor plan
- Reflected ceiling plan
- Exterior elevations showing branding
- Building cross sections
- Interior elevations
- 3D images
- Detailed lab plan
- Equipment location and workflow
- Detailed equipment schedule
- Full cutsheet package
- Design narrative
- Security plan
- Waste disposal plan

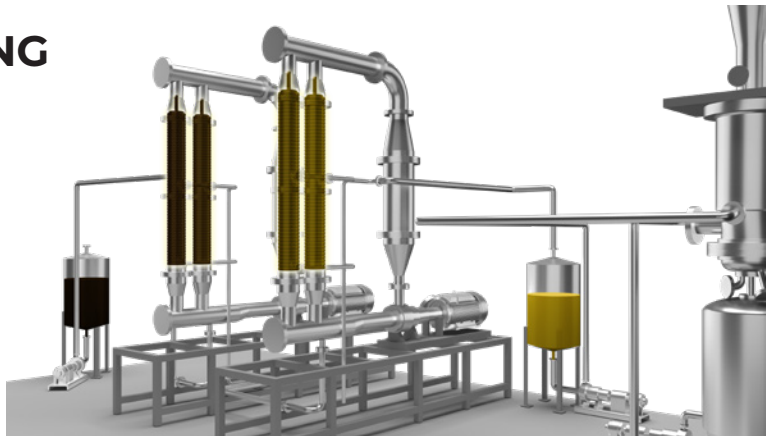
DEVELOPMENT ENGINEERING II

- Construction documents
- City permit drawings
- Full civil engineering drawings
- Full architectural drawings
- Full mechanical electrical and plumbing drawings
- Code compliance and zoning report
- Additional 3D images



PHASE II & III

PHASE II: INSTALLATION & TRAINING



On-site presence and project management

Installation of equipment

Initial testing and debugging

Maximum quality parameters established

Maximum yield benchmarks set

30 days onsite training of operators

Independent operation commences

PHASE III: PEAK PERFORMANCE & MAXIMUM YIELD

Quality Control Parameter Reviews

Performance Oversight

Continuous Process Improvement

Maximization of Yield, Efficiency & Uptime

Operator Training & Continuing Education

Technology Upgrades

Maintenance, Service & Support

- Remote monitoring of all critical components
- Rapid replacement part availability:
  - Motors
  - Pumps
  - Filters
  - Gaskets
  - Meters
  - Valves
- Periodic onsite visits to conduct all-point inspection of:
  - Equipment performance
  - Operational efficiencies
  - Operator competence
  - Yield values
- On-demand rapid onsite technician availability

VALUE ADD TECHNOLOGY LICENSE

The above is included with the KPD technology license, requiring a 1.5¢/mL of crude oil licensing fee payable to Precision® on a monthly basis, subject to continuing minimum output and additional terms provided for in the KPD Value Add Technology License Agreement.

PX2 HOLDINGS LLC
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