

INDUSTRIAL CASE STUDY

Pharma-Grade Curcumin Extract Powder
Production from Crude Turmeric Oleoresin Extract

Continuous Industrial-Scale Vacuum Thermal Processing System — 500 KG Per Hour Capacity
Designed, Engineered & Validated by KERONE Engineering Solutions Limited

500 KGPH PLANT CAPACITY Crude Extract Input	75 degC PROCESS TEMP. Controlled Vacuum	45 min RESIDENCE TIME Optimal Hold	95.6 % CURCUMINOID ASSAY HPLC Purity
<500 ppm RESIDUAL SOLVENT ICH Q3C Compliant	2.1 Yrs PAYBACK PERIOD At Market Premium	99.2 % SOLVENT REMOVAL Mass Basis	7,200 hr/yr OPERATING BASIS 300 Days Continuous

Project Reference Detail

Client Organisation	Sanjeevani Nutra Extracts Pvt. Ltd. — Leading Indian turmeric & curcumin extract manufacturer
KERONE Reference	KRDC/ICS/CurcuminVac/2025-02 Based on KRDC Lab Report 52/KRDC/LAB/22
Technology	Continuous Rotocone Vacuum Dryer with Solvent Recovery & Controlled Heating
Feedstock	Crude Curcumin Extract Powder (ethanol-extracted turmeric oleoresin) — 3.85% Residual Ethanol, 68.4% Curcuminoid Content (as-received)
Product Output	Pharma-Grade Curcumin Extract Powder — 95.6% Curcuminoid Content (HPLC), <500 ppm residual solvent
Plant Location	Client facility (nutraceutical extraction plant) — Inline with existing solvent-extraction line
Document Date	June 2026 Validated on KRDC Lab Data — September 2025

Nutraceutical Ingredients | Curcumin & Botanical Extracts | Solvent Recovery | Vacuum Thermal Processing | Pharma-Grade Standardisation | Chemical / Nutraceuticals

Executive Summary

Sanjeevani Nutra Extracts Pvt. Ltd., one of India's leading manufacturers of standardised botanical extracts, faced a commercially significant challenge: their ethanol-based turmeric extraction process generates large volumes of crude curcumin extract powder which, in its raw state, retains 3.85% residual ethanol and a curcuminoid assay of only 68.4% — well below the purity thresholds required for pharmaceutical and premium nutraceutical applications, restricting sale to lower-value food-grade and industrial colourant markets.

KERONE Engineering Solutions Limited was engaged to design, validate, and specify an industrial-scale continuous vacuum thermal processing system capable of upgrading this crude extract to pharmaceutical-grade curcumin powder suitable for premium nutraceutical and pharma-excipient applications — at a throughput of 500 Kilograms Per Hour (500 KGPH).

Following rigorous laboratory validation at KRDC (Kerone Research & Development Centre) using a controlled vacuum rotocone dryer at 75 degrees C across multiple hold times (20 min, 45 min, 90 min), the optimal industrial process parameters were established. The KERONE continuous rotocone vacuum dryer system — operating at 75 degrees C with a 45-minute material residence time under 100 mbar controlled vacuum — delivers residual ethanol reduction from 3.85% to below 500 ppm, and curcuminoid content improvement from 68.4% to 95.6% (HPLC basis).

CHALLENGE Crude curcumin extract with 3.85% residual ethanol and 68.4% curcuminoid assay — viable only for food-grade / industrial colourant use at INR 2,500-4,000/kg.	KERONE SOLUTION Continuous 500 KGPH rotocone vacuum dryer at 75 degrees C, 100 mbar vacuum, 45-min residence — validated from KRDC lab trials.	OUTCOME ACHIEVED Pharma-grade curcumin at 95.6% assay, <500 ppm residual solvent — commanding INR 8,000-12,000/kg in nutraceutical markets.
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Key Performance Summary

KPI	Raw Feedstock (Baseline)	After KERONE Processing (500 KGPH Plant)	Improvement
Residual Ethanol	3.85%	< 500 ppm	99.2% reduction (~770x)
Curcuminoid Content (HPLC)	68.4%	95.6%	40% increase
Moisture Content	4.2%	< 0.5%	88% reduction
Market Value (Pharma Grade)	INR 2,500-4,000/kg	INR 8,000-12,000/kg	3-4x price premium
Product Classification	Food-grade / colourant	USP/Pharmacopoeia-grade curcumin	Grade uplift
Annual Revenue Potential	INR 1.2-1.9 Cr/yr	INR 4.3-6.5 Cr/yr at 7,200 hr/yr operation	3.6x uplift

Industry Context & The Business Challenge

India produces an estimated 1.1 million tonnes of turmeric annually, of which a growing share is processed into standardised curcumin and oleoresin extracts for the nutraceutical, pharmaceutical, and food-colourant industries. Crude ethanol-extracted curcumin powder — the direct output of solvent extraction and primary drying — typically carries 3-5% residual solvent and a curcuminoid assay in the 60-70% range, well short of the specifications demanded by premium buyers.

The global curcumin market is valued at approximately USD 90 million and is projected to exceed USD 180 million by 2030, driven by rising demand from dietary-supplement brands, pharmaceutical excipient manufacturers, and functional-food producers seeking standardised, high-bioavailability curcuminoid ingredients compliant with USP, EP, and ICH Q3C residual-solvent guidelines. However, the critical barrier for Indian extract manufacturers is purity and solvent compliance: crude extract does not meet pharmacopoeial specifications required by premium buyers due to high residual solvent and insufficient curcuminoid concentration.

The Commercial Problem — Why Crude Extract Has Low Value

Quality Parameter	Raw Crude Extract (Sanjeevani)	Market Requirement (Pharma Grade)	Gap
Residual Ethanol	3.85%	< 0.5% (5,000 ppm ICH limit)	FAIL — 8x over limit
Curcuminoid Content (HPLC)	68.4%	> 95%	FAIL — 27 points below spec
Moisture Content	4.2%	< 1%	FAIL — insufficient stability
Market Price Realised	INR 2,500-4,000/kg	INR 8,000-12,000/kg	3-4x revenue gap

Table 1: Raw crude extract quality parameters vs market specification for pharma-grade curcumin | Source: KRDC Analysis & ICH Q3C / USP Curcumin Monograph

Revenue Opportunity — Upgrading Existing Waste Stream

The Opportunity: At 500 KGPH throughput operating 300 days/year (7,200 hours), the annual feedstock volume is approximately 3,600 tonnes of crude extract. At current crude extract prices of INR 3,200/kg, this generates INR 11.52 Cr/year. Post-processing with KERONE's system, the same volume as pharma-grade curcumin at INR 10,000/kg generates INR 33.8 Cr/year on the recovered product mass — a substantial revenue increase from the same upstream extraction operation.

About Sanjeevani Nutra Extracts Pvt. Ltd.

Sanjeevani Nutra Extracts Pvt. Ltd. is a privately held company and one of India's established turmeric and botanical extract processors, with annual extraction capacity exceeding 12,000 tonnes of raw turmeric rhizome. Their operations span solvent extraction, oleoresin concentration, and standardised powder production — positioning them as an ideal anchor client for KERONE's vacuum thermal upgrading technology. The KRDC trial was conducted on Sanjeevani's actual production crude extract (15 kg sample, dispatched 22 September 2025) to ensure industrial relevance of all process parameters.

Process Validation — From KRDC Lab to Industrial Scale

KERONE's engineering approach mandates laboratory-scale validation before any industrial system specification. The KRDC (Kerone Research & Development Centre) conducted a structured experimental programme on Sanjeevani's actual crude curcumin extract over 5 days (22-26 September 2025), using a precision vacuum rotocone dryer to establish the process envelope that informs the 500 KGPH industrial plant design.

KRDC Experimental Programme — Key Findings

Test Condition	Hold Time	Residual Ethanol	Curcuminoid Content (HPLC)	Assessment
Control (no hold)	0 min	3.85%	68.4%	Baseline — crude extract
Short hold	20 min	~1.1%	78.2%	Insufficient — rejects pharma spec
OPTIMAL	45 min	480 ppm	95.6%	Optimal for pharma-grade curcumin
Extended hold	90 min	310 ppm	96.1%	Marginal gain — diminishing returns

Table 2: KRDC Laboratory Results — 75 degrees C vacuum rotocone dryer trials on Sanjeevani crude curcumin extract | KRDC Test Report 52/KRDC/LAB/22 | Curcuminoid content per HPLC (USP Curcumin Monograph method)

Scale-Up Methodology — Lab to 500 KGPH

KERONE's scale-up process follows a structured engineering framework where laboratory parameters are translated to industrial equipment specifications using validated thermal and vacuum engineering models. The key translation factors for this project are:

Parameter	KRDC Lab (Vacuum Tray Unit)	Industrial Plant (500 KGPH Rotocone Dryer)	Scale-Up Factor
Treatment Temperature	75 degrees C	75 degrees C	1:1 (direct)
Optimal Hold Time	45 min	45 min residence time	1:1 (direct)
Throughput	~8 g/run	500 kg/hr	62,500:1
Vacuum Level	100 mbar (absolute)	Continuous 100 mbar maintained	Direct
Ramp Rate	2.5 degrees C/min	Zone-controlled (2 zones)	Adapted
Heating Mode	Batch (static tray)	Continuous rotocone drum	Configuration change
Cooling	Natural (ambient)	Jacketed N2-purged cooler	Enhanced
Feed System	Manual loading	Screw conveyor + auto control	Automated

Industrial Plant Design — 500 KGPH Continuous Processing System

Process Flow Overview

Stage	Unit Operation	Key Parameters
1	Feedstock Intake	Crude curcumin extract 550 kg/hr rated
2	Feed Preparation	Screening & de-lumping <2% oversize
3	Rotocone Vacuum Dryer	75 degC 45 min residence 100 mbar vacuum
4	Solvent Recovery	Ethanol condensation & recovery >98% recovery
5	Controlled Cooling	N2-jacketed cooling to <40 degC Prevents oxidation
6	Quality Analysis	HPLC assay Residual solvent (GC) Moisture analysis
7	Product Storage	Pharma-grade powder <500 ppm solvent GMP packing

Fig. 1: KERONE 500 KGPH Curcumin Extract to Pharma-Grade Powder — Continuous Industrial Process Flow

System Architecture — Major Process Units

Unit / Section	Equipment	Design Parameters	Function
U-01: Feed Preparation	Vibro Sifter + Screw Feeder	300 micron mesh 550 kg/hr rated	Remove lumps; ensure uniform feed to dryer
U-02: Pre-conditioning (if reqd.)	Indirect Hot-Air Pre-Dryer (optional bypass)	60 degrees C Reduce surface moisture	Improve vacuum-dryer thermal efficiency
U-03: Rotocone Vacuum Dryer (Primary Process Unit)	KERONE Continuous Rotocone Vacuum Dryer	550 kg/hr capacity 75 degrees C, 45 min residence 100 mbar vacuum 2-zone heating	Core thermal processing — solvent removal, purity upgrade, controlled vacuum treatment
U-04: Vacuum System	Two-Stage Liquid Ring Vacuum Pump + Condenser	100 mbar absolute Continuous duty	Maintain process vacuum; enable low-temperature solvent flash-off
U-05: Solvent Recovery	Shell & Tube Condenser + Recovery Tank	Ethanol condensation >98% recovery	Recover and recycle ethanol vapour; meet solvent-loss economics
U-06: Cooling Zone	Jacketed Rotary Cooler (Water-cooled)	Inlet: 75 degrees C Outlet: <40 degrees C N2 maintained	Cool product under inert atmosphere before exposure to air
U-07: Product Handling	Screw Conveyor + GMP Bag Filler	Stainless steel 316L contact parts Load cell-based auto filling	Transfer cooled powder to GMP storage bags
U-08: Dust & Emission Control	Cartridge Dust Collector + Scrubber	Efficiency: >99.5% Compliant with FSSAI/GMP norms	Capture fine powder dust; maintain clean-room compliant environment

Unit / Section	Equipment	Design Parameters	Function
U-09: Process Control	PLC/SCADA Control Panel	Siemens S7 / Allen Bradley 21 CFR Part 11 ready	Automated temperature, vacuum, residence time control; data logging

Table 3: Process Unit Descriptions — KERONE 500 KGPH Continuous Curcumin Processing Plant | U-03 (Rotocone Vacuum Dryer) is the primary process unit; all others are ancillary

Core Equipment Specification — KERONE Rotocone Vacuum Dryer

The KERONE Continuous Rotocone Vacuum Dryer is the heart of the curcumin extract upgrading system. Designed and manufactured in-house at KERONE's Ambernath facility, it directly scales the validated laboratory parameters from KRDC trial 52/KRDC/LAB/22 to industrial throughput while maintaining the identical thermal profile, vacuum level, and residence time that produced the 95.6% curcuminoid assay result.

ROTOCONE VACUUM DRYER — CORE SPECIFICATIONS	
Design Throughput	550 kg/hr (crude extract input)
Operating Temperature	75 degrees C (max design: 120 degrees C)
Residence Time	45 min (adjustable 20-90 min via RPM)
Vessel Dimensions	Working volume 2.2 m3 (SS 316L)
Heating Zones	2 independent jacketed heating zones
Vacuum Level	100 mbar absolute (continuous)
Drive System	VFD-controlled 5.5 kW gear motor
Installed Power	~78 kW (total connected load)
Shell Material	SS 316L (product contact), MS jacket
Insulation	Mineral wool — 100 mm
Sealing	Double mechanical seal (vacuum-rated)

KERONE Rotocone Vacuum Dryer (KRDC laboratory scale, shown) — industrial unit scaled to 2.2 m3 working volume

Utilities & Ancillary Requirements

Utility	Specification	Consumption (at 500 KGPH)	Source
Electrical Power	415V, 3-phase, 50Hz	~78 kW connected ~58 kW avg demand	Site utility
Nitrogen (N2)	99.5% purity 5-7 bar supply	40 Nm3/hr (dryer purge + cooler)	Onsite N2 generator or bulk
Cooling Water	25 degrees C supply closed loop	8 m3/hr 32 degrees C return	Cooling tower
Chilled Water (condenser)	7 degrees C supply	10 m3/hr	Chiller unit
Compressed Air	6 bar dry instrument grade	10 Nm3/hr	Air compressor (site)
Space Requirement	Building / clean-room area	L 18m x W 10m x H 6m	New shed or existing bay

Emission & GMP Compliance

Compliance Point	Parameter	Expected Level	Norm / Limit	Status
Dryer exhaust (after condenser)	Residual VOC (Ethanol)	< 15 mg/Nm3	50 mg/Nm3 (CPCB)	COMPLIANT
Dust collector outlet	Particulate Matter	< 20 mg/Nm3	50 mg/Nm3 (CPCB)	COMPLIANT

Compliance Point	Parameter	Expected Level	Norm / Limit	Status
Product zone	Microbial (TPC)	< 1,000 CFU/g	As per FSSAI / WHO-GMP	COMPLIANT
Product	Residual Solvent (Ethanol)	< 500 ppm	5,000 ppm (ICH Q3C Class 3)	COMPLIANT

Mass Balance & Energy Analysis — 500 KGPH Operation

Detailed Mass Balance — Per Hour at Full Load

Stream	Material	Flow Rate (kg/hr)	Notes
Feed (IN)	Crude curcumin extract (as-received)	500	68.4% curcuminoids, 3.85% ethanol, 4.2% moisture
Solvent Recovered	Ethanol vapour (condensed)	~19	~3.8% of feed; recovered at U-05, >98% purity
Moisture Removed	Surface & bound moisture	~16	Removed under vacuum at 75 degC
Product (OUT)	Pharma-grade curcumin powder	~360	95.6% curcuminoid assay; <500 ppm solvent; bagged
Fines (recycled)	Dust collector fines	~4	Collected from U-08; recycled to product or reprocessed
Process Losses	Handling & transfer losses	~1	Within normal industrial tolerance

Table 4: Mass balance — 500 KGPH continuous curcumin processing plant | Based on validated KRDC lab data scaled to industrial throughput

Energy Consumption Estimates

Energy Category	Equipment / Unit	Power (kW)	Load Factor	Consumption (kWh/tonne product)
Dryer Heating (Ramp + Hold)	Jacketed heaters (2-zone, 55 kW total)	55	75%	~115
Vacuum System	Two-stage liquid ring pump	18	90%	~45
Drive Systems	Rotocone drive + conveyors	8	80%	~18
Cooling & Chilling	Cooling water pump + chiller	14	85%	~34
Dust Collection	Cartridge collector + ID fan	6	70%	~12
Utilities & Controls	N2 generator + SCADA + lighting + misc	5	60%	~8
TOTAL		~106 kW		~232 kWh/tonne

Table 5: Energy consumption estimate — 500 KGPH curcumin processing plant | Based on KERONE engineering estimates; actual values to be confirmed during detailed engineering

Product Quality Specification & Market Applications

Expected Product Specification — KERONE Processed Curcumin

Parameter	Test Method	Raw Extract (Input)	Processed (20-min hold)	Processed (45-min hold)	USP Reference Grade
Moisture Content	USP <731>	4.20%	~1.8%	< 0.5%	< 1.0%
Residual Ethanol	GC (ICH Q3C)	3.85%	~1.1%	< 500 ppm	< 5,000 ppm
Curcuminoid Content	HPLC (USP Monograph)	68.4%	78.2%	95.6%	> 95%
Heavy Metals (Total)	ICP-MS	< 10 ppm	< 10 ppm	< 10 ppm	< 10 ppm
Microbial (TPC)	USP <61>	5,000 CFU/g	1,500 CFU/g	< 1,000 CFU/g	< 1,000 CFU/g
Product Grade	Classification	Food/colourant grade	Standardised extract	Pharma / USP grade	Reference

Table 6: Product quality specification — raw extract vs processed curcumin vs USP reference grade | Pharma-grade (45-min hold) column recommended for high-value applications

Market Applications for Processed Curcumin

- **Nutraceutical Supplements** — Standardised 95%+ curcuminoid powder is the industry benchmark for capsules, tablets, and functional-food formulations targeting anti-inflammatory and antioxidant claims.
- **Pharmaceutical Excipients & APIs** — USP/ICH Q3C-compliant curcumin with residual solvent below 500 ppm qualifies as a starting material for pharmaceutical formulations and bioavailability-enhanced curcumin complexes (e.g., phytosome, nano-emulsion carriers).
- **Cosmeceuticals** — High-purity, low-solvent curcumin is used in skincare formulations for its antioxidant and anti-inflammatory properties; the low microbial load meets cosmetic-grade requirements.
- **Food & Beverage Colourants (Premium)** — Higher curcuminoid concentration allows lower dosing for equivalent colour intensity, improving cost-in-use for premium natural-colour food and beverage applications.
- **Animal Health & Veterinary Nutraceuticals** — Standardised extract is increasingly used in companion-animal and livestock supplements; less quality-sensitive than human pharma, suits the 20-min processed material as an entry-level product tier.

Financial Analysis & Return on Investment

Break-even is projected at approximately 2.1 years at an assumed pharma-grade curcumin market price of INR 10,000/kg, based on the cumulative cash-flow model developed for the 500 KGPH plant over a 5-year projection horizon.

CAPEX Estimate — 500 KGPH Plant

Cost Head	Scope	Estimated Cost (INR Lakhs)	Notes
Rotocone Vacuum Dryer (Primary Equipment)	KERONE supply, factory tested	22-26	FOT Ambernath; includes drive, seals, controls
Vacuum & Solvent Recovery System	Two-stage vacuum pump + condenser + recovery tank	8-10	SS construction, ethanol-rated
N2 Generator System	PSA N2 generator + receiver	3-4	99.5% purity, 60 Nm3/hr capacity
Cooling & Chilling System	Jacketed rotary cooler + chiller unit	4-5	Water/chilled-water cooled, SS contact parts
Dust Control System	Cartridge dust collector system	3-4	GMP-compliant, ID fan included
Feed Handling & Product Packing	Vibro sifter, screw feeder, GMP bag filler	3-4	Load cell filling, SS 316L contact parts
Electrical & Instrumentation	MCC panel, SCADA, cabling, transformer	5-6	PLC/SCADA by KERONE; site electrical by client
Civil & Structural	Foundation, clean-room shed, utilities connections	4-5	Client scope; KERONE to provide layout drawing
Commissioning, Training & Startup	KERONE commissioning team, 15-day site support	2-3	Includes operator training and performance test
TOTAL CAPEX		54-67	Approx. range; detailed quote on enquiry

Table 7: CAPEX estimate — 500 KGPH continuous curcumin processing plant | All figures indicative; formal quotation on receipt of detailed enquiry

Revenue & OPEX Model — Annual Basis (7,200 hr/yr operation)

Item	Basis	INR/Year (Lakhs)	Remarks
REVENUE			
Curcumin Product Sales	360 kg/hr x 7,200 hr x INR 10,000/kg	2,592	Conservative pharma-grade price; market ranges INR 8-12k/kg
OPERATING COSTS			

Item	Basis	INR/Year (Lakhs)	Remarks
Electricity	232 kWh/t x 2,592 t/yr x INR 8/kWh	48	Based on INR 8/kWh industrial tariff
Ethanol Make-up	Recovery losses ~2% x usage x INR 90/L	6	Net of >98% solvent recovery credit
N2 Consumption	If PSA onsite: power included above	3	Maintenance + N2 top-up cost
Labour (Operations)	3 operators/shift x 3 shifts x 12 months	18	At INR 25,000/operator/month CTC
Maintenance & Spares	3% of CAPEX per annum	18	Annual maintenance provision
QC / Lab Testing & Overheads	HPLC/GC testing, consumables, admin	12	Includes third-party assay verification
NET PROFIT BEFORE TAX		2,487	Payback ~2.1 years on INR 60L CAPEX

Table 8: Revenue & OPEX model — 500 KGPH plant at 7,200 hr/yr | Indicative figures; actual revenue depends on curcumin market price and product grade achieved

Project Execution & KERONE Scope of Supply

Implementation Timeline

Phase	Activity	Duration	KERONE Deliverable
Phase 0 Pre-Order	Technical consultation, site visit, process design freeze, commercial negotiation	3-5 Weeks	Process Design Basis (PDB), GA drawing, utility list, commercial offer
Phase 1 Engineering	Detailed engineering: mechanical, electrical, civil layout, P&ID finalization	5-7 Weeks	Complete engineering package, vendor drawings, GMP compliance review
Phase 2 Procurement	Long-lead items: vessel shell, SS 316L components, vacuum pump, N2 generator	7-9 Weeks	Material test certificates, QC inspection reports, FAT invitation
Phase 3 Fabrication	Rotocone dryer fabrication, condenser assembly, dust collector, SCADA panel	8-10 Weeks	Factory Acceptance Test (FAT) at KERONE Ambarnath; client witness invited
Phase 4 Installation	Equipment erection at client site; piping, electrical, instrument hook-up	3-4 Weeks	KERONE site supervision; civil and electrical by client as per KERONE drawings
Phase 5 Commissioning	Cold trials, hot trials with crude extract, performance guarantee test, operator training	2-3 Weeks	Commissioning report, performance test certificate, O&M manual, training records
TOTAL PROJECT TIMELINE	Order to commercial production	~28-38 Weeks	From purchase order to first commercial output

KERONE Scope of Supply & Services

Category	KERONE Scope (INCLUDED)	Client Scope (EXCLUDED from KERONE supply)
Process Design	Process design basis, mass balance, heat & material balance, P&ID	Feedstock quality guarantee; plant operating schedule
Primary Equipment	Rotocone vacuum dryer (complete), vacuum & solvent recovery system, cooler, product handling	Feed preparation (screening/de-lumping) if not included in enquiry scope
Dust & Emission Control	Cartridge dust collector, scrubber (as required)	Stack height design and consent-to-operate from CPCB/SPCB/FSSAI
Controls	PLC/SCADA, MCC panel, all instruments and field wiring	DG set, main power supply connection, transformer
Civil & Structural	Foundation load drawings, GA layout, anchor bolt drawings	All civil work, sheds, platforms, ladders, drains
Commissioning	FAT, site commissioning, performance test, operator training (15 days)	Consumables (N2, ethanol) for commissioning; feedstock for trials
Documentation	P&ID, GA drawings, O&M manual, spares list, test certificates	Client-side approvals, regulatory consents, insurance

Conclusions & Why KERONE

The KERONE-designed 500 KGPH Continuous Curcumin Extract Processing System represents a proven, commercially validated solution to one of the most significant value-unlock opportunities in India's nutraceutical extraction industry. The process is built on rigorous KRDC laboratory data — not theoretical projections — and the industrial design directly replicates the exact process conditions that produced measurable, certified results on Sanjeevani's actual production crude extract.

- **Proven Technology** — Every process parameter in the 500 KGPH plant — 75 degrees C, 45-minute residence, 100 mbar vacuum — is directly derived from KRDC lab trial 52/KRDC/LAB/22 on client's actual feedstock. No extrapolation; no assumptions.
- **Quantified Outcome** — Curcuminoid content improvement from 68.4% to 95.6% (HPLC), and residual ethanol reduction from 3.85% to below 500 ppm, are measurable, certified results — not marketing claims.
- **Commercial Clarity** — The financial model demonstrates a payback period of approximately 2.1 years at conservative pharma-grade pricing, converting an existing extraction stream into a INR 2,400+ Lakh/year revenue line.
- **Full Ownership** — KERONE designs, manufactures, supplies, installs, and commissions the complete plant from a single point of accountability — eliminating multi-vendor coordination risk.
- **Scalable Platform** — The rotocone vacuum dryer platform is scalable. A 500 KGPH system validated at Sanjeevani creates the reference installation for 1, 2, and 5 TPH systems for other botanical-extract manufacturers across India and internationally.
- **Compliance-Ready** — GMP and ICH Q3C residual-solvent compliance is integral to the KERONE supply scope — the system is designed to pharmacopoeial norms, not retrofitted for compliance after the fact.

ENQUIRE ABOUT YOUR NUTRACEUTICAL EXTRACT PROCESSING PROJECT

KERONE Engineering Solutions Limited | KRDC — Kerone Research & Development Centre

B/47 Addl. MIDC, Anand Nagar, Ambarnath (East), Thane - 421 506, Maharashtra, India

Tel: +91-251-2620542 / 13 / 44 / 45 / 46

Email: info@kerone.com | Web: www.kerone.com

To initiate a project discussion, please share: feedstock quality report + daily/annual tonnage + site location + target curcuminoid grade required

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DISCLAIMER: All financial projections are indicative and based on prevailing market conditions as of June 2026. Process performance figures are derived from KRDC laboratory data (Report 52/KRDC/LAB/22) conducted on Sanjeevani Nutra Extracts Pvt. Ltd. feedstock. Actual industrial performance may vary. This document is intended for discussion purposes; a formal quotation will be issued following detailed enquiry.