

Quicklime & Hydrated-Lime Production Line

Complete Turnkey Business Proposal



Made-in-China supplier reference: real quicklime & hydrated-lime production line equipment.

50-100 t/day screened quicklime basis	3-5 t/h hydrator capacity study	2 products separate silo routes	35-60 plant workforce
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Prepared for investment planning in Afghanistan and regional export markets. Final specifications, pricing, civil works, and utility loads require supplier quotation and site survey.

Executive Summary

An integrated medium/large lime plant converting tested limestone into quicklime and a controlled portion into hydrated lime. The route comprises limestone receiving, crushing and screening, kiln-feed storage and weighing, fuel preparation, vertical-shaft kiln calcination, lime cooling, quicklime screening and silo storage, controlled slaking with water, hydration ageing and classification, dust collection, separate silos, bulk or bag packing, laboratory release and environmental monitoring.

Why this project fits Afghanistan

- Afghan limestone can supply construction, water-treatment, mining and selected agricultural markets after product qualification.
- An integrated kiln and hydrator creates two products but requires strict material, fuel and safety control.
- A vertical shaft kiln offers a lower-capacity entry than a large rotary kiln when stone sizing and fuel are stable.
- Air emissions, caustic dust, high temperature and hydration heat require engineered controls and permits.

Sanaatchi delivery scope

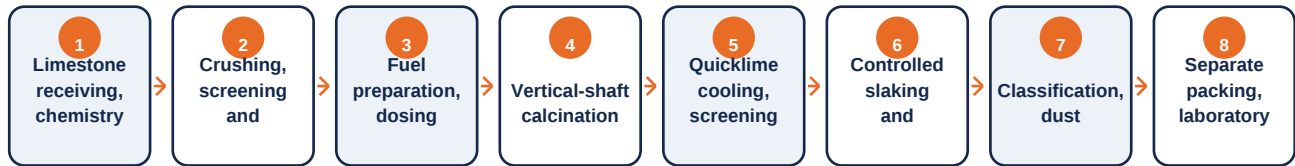
- Factory setup planning, supplier pre-qualification, and technical comparison
- Complete production-line and individual equipment supply
- Factory layout, utilities, civil-work coordination, installation, and commissioning
- Raw-material sourcing, trial-batch qualification, and repeat supply planning
- International logistics, customs documentation, operator training, spare parts, and after-sales support

Recommended configuration

Proceed only after quarry chemistry, decrepitation, kiln fuel and permitted emissions are proven. Screen an integrated 50-100 t/day vertical-shaft kiln with calibrated stone sizing, fuel dosing, cooler, enclosed quicklime handling, a 3-5 t/h multi-stage hydrator, classifier, baghouses, separate quicklime and hydrated-lime silos, packing and laboratory. The hydrator cannot replace the kiln: it converts purchased or produced CaO into Ca(OH)₂.

Manufacturing Process & Product Portfolio

Integrated process flow



Target products

Product	Typical specification	Primary market
Quicklime	Buyer-defined available CaO, reactivity, size, loss on ignition and residual carbonate	Mining, metallurgy, construction and water-treatment users after trials
Hydrated lime	Available Ca(OH) ₂ /CaO, fineness, moisture, bulk density and reactivity	Mortar, water treatment, mining and environmental users

Limestone chemistry alone is insufficient; kiln behavior depends on stone size, strength, decrepitation, porosity and fuel ash. Acceptance uses the named quarry stone and fuel and measures output, fuel/t, available CaO, residual carbonate, reactivity, fines, temperature, kiln pressure, dust emissions and hydration quality. Quicklime reacts violently with water and requires dedicated procedures.

Core Equipment Schedule

Step	Equipment	Function	Indicative parameter
1	Limestone crusher, screens and storage	Produces narrow, clean kiln-feed sizing	Quarry-test dependent
2	Fuel preparation and gravimetric dosing	Feeds stable heat input to the kiln	Selected legal fuel
3	Vertical shaft lime kiln	Calcines CaCO_3 into CaO	50-100 t/day basis
4	Lime cooler and enclosed conveyors	Recovers heat and handles hot caustic quicklime	Low-air-inleak design
5	Quicklime screen and silo	Separates saleable lump/fine grades	Dedicated dry storage
6	Multi-stage lime hydrator	Slakes controlled quicklime with measured water	3-5 t/h study basis
7	Classifier, ageing and hydrate silo	Controls fineness and completes reaction	Separate product route
8	Baghouse, packing and laboratory	Controls dust and releases both products	Emission and chemistry monitoring

Equipment models are indicative and will be matched to the selected capacity, local raw-material tests, available utilities, and preferred automation level.

Reference Equipment Gallery



Made-in-China supplier reference: real quicklime & hydrated-lime production line equipment.



Made-in-China supplier reference: second real machine configuration for quicklime & hydrated-lime production line.

Images are supplier references for configuration discussion; final equipment appearance and model may differ.

Plant, Raw Materials & Utility Requirements

Raw materials

- Tested limestone with controlled CaCO_3 , MgCO_3 , silica, sulfur, alkalis and physical strength
- Permitted kiln fuel with stable calorific value, ash and sulfur
- Clean hydration water with controlled dosing
- Heat-resistant refractory, bags/bulk loading consumables, filters and critical kiln/hydrator spares

Utilities & infrastructure

- Quarry-to-plant stone supply and covered graded feed storage
- Stable three-phase power and emergency/critical control backup
- Kiln fuel receiving, fire safety and combustion-air system
- High-temperature refractory, induced draft and continuous process instrumentation
- Baghouses, stack monitoring, sealed caustic-product handling and emergency showers

Quality, safety and environmental controls

- Test each limestone and fuel lot before kiln blending
- Control kiln feed size, fuel ratio, temperature and draft
- Measure quicklime available CaO , residual carbonate and reactivity
- Control slaker feed, water ratio, temperature and residence
- Test hydrate fineness, moisture and unreacted lime
- Monitor emissions, refractory condition, dust exposure and bag weights

A final factory layout must reserve safe forklift routes, maintenance clearances, raw-material segregation, finished-goods storage, fire protection, ventilation, and future expansion space.

Indicative Investment & Implementation Plan

LOW-ENTRY CONFIGURATION

The lowest credible integrated project uses a 50-100 t/day shaft kiln and hydrates only contracted demand. It retains full dust, heat and laboratory systems; quarry fleet, land, building and working capital are excluded.

Component	Indicative range	Notes
Stone preparation, storage and fuel systems	US\$450k-1.20m	50-100 t/day integrated basis
Vertical shaft kiln, cooler and quicklime handling	US\$1.10m-3.00m	Core high-temperature plant
Hydrator, classifier, silos and packing	US\$450k-1.35m	3-5 t/h hydrate route
Civil works, utilities, emissions, erection and spares	US\$700k-2.25m	Site and permit dependent
Indicative installed project total	US\$2.70m-7.80m	Quarry fleet, land, building and working capital excluded

Implementation sequence

Phase 1	2-5 weeks	Confirm product specification, representative raw material, buyer, capacity, site and utilities
Phase 2	3-7 weeks	Run supplier trials with the buyer material and freeze the balanced machine, tooling and utility scope
Phase 3	8-22 weeks	Manufacture or refurbish, inspect, document and ship the contracted equipment
Phase 4	3-12 weeks	Install, commission, train operators and pass material-specific acceptance tests

Ranges are planning targets for a low-cost entry configuration, exclude land, and remain subject to confirmed capacity, supplier quotation, freight, duties, exchange rates and site conditions.

Next Steps & Contact Information

Recommended next steps

- Confirm target products, hourly output, and packaging formats
- Test representative raw materials and document quality requirements
- Complete site survey covering electricity, water, fuel, drainage, roads, and warehouse space
- Request comparable technical and commercial quotations from shortlisted suppliers
- Finalize financing, logistics, installation, training, and spare-parts plan

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Research and image references

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