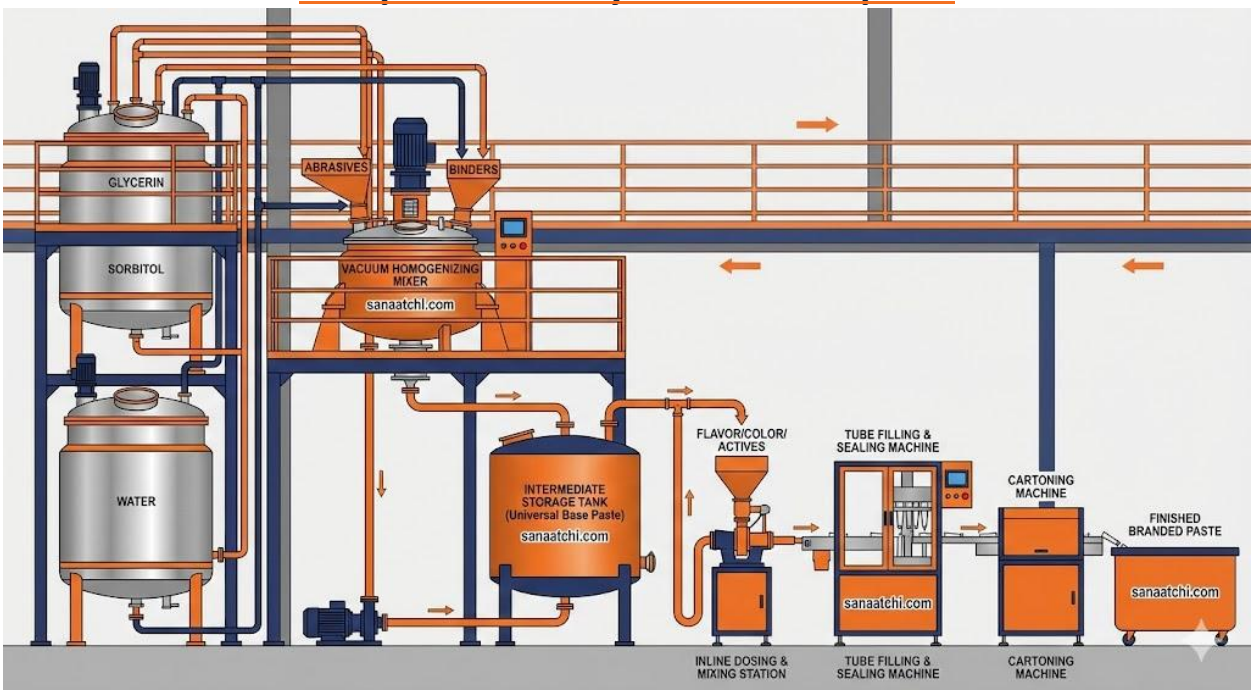
SANAATCHI
INDUSTRIAL VISION GROUP

TOOTHPASTE PRODUCTION LINE

Complete TurnKey Business Proposal



Hero image showing a stylised toothpaste production line with Sanaatchi logo

Executive Summary

The proposed toothpaste production line is a fused, fully integrated system designed to produce high-quality toothpaste at scale. It combines advanced vacuum homogenising technology, degassing and storage, high-speed tube filling/sealing and automated cartoning into one seamless flow, enabling rapid entry into the growing oral-care market. Key highlights include:

- **Production capacity:** Approximately **10 000 – 20 000 tubes per hour** depending on formulation and tube size.

- **Investment range: US $80 000 – $150 000**, covering equipment (vacuum homogeniser, storage/degassing tank, tube filling & sealing machine, cartoning/packaging line), installation, training and working capital.
- **Payback period: 12 – 24 months** at 70 % utilisation.
- **Market size:** Strong domestic demand for oral care products coupled with reliance on imports presents a significant opportunity to localise manufacturing and capture regional export markets.

This proposal details the product portfolio, manufacturing process, raw-material requirements, investment estimates, quality standards and next steps for launching a toothpaste production line.

About Sanaatchi Industrial Vision

Sanaatchi Industrial Vision is Afghanistan's premier partner for turnkey manufacturing and industrial solutions. Our motto – *Your vision, our expertise* – reflects a commitment to transform a client's concept and capital into a fully operational factory. Clients articulate the idea and provide investment; we deliver everything from engineering design to the first finished product. Our services are organised into four integrated phases:

1. **Engineering & Design:** Technical and economic feasibility studies, conceptual layouts and detailed design of the production line.
2. **Global Sourcing & Logistics:** Identification and vetting of reliable suppliers worldwide and full management of procurement and transportation.
3. **Implementation & Construction:** Project management, civil works supervision and installation of machinery and utilities.
4. **Commissioning & Support:** Pre-commissioning and final testing, operator training, after-sales service and ongoing technical assistance.

By emphasising transparency, competitive pricing and strict adherence to timelines, Sanaatchi ensures clients receive a compliant, efficient and profitable production facility.

Market Opportunity in Afghanistan

Afghanistan's oral-care market is dominated by imported toothpaste brands from Turkey, Pakistan and multinational companies. Establishing a local toothpaste factory offers multiple advantages:

- **Rising oral-health awareness:** Urbanisation and public-health campaigns are driving demand for fluoride toothpaste to prevent cavities and maintain dental hygiene.
- **Young population:** A youthful demographic is increasingly adopting daily oral-care routines, creating a long-term growth market.

- **Import substitution:** High tariffs on imported oral-care products make locally manufactured toothpaste cost-competitive while ensuring freshness and customisation.
- **Product differentiation:** Local producers can offer herbal formulations, halal certification and tailored packaging sizes for regional preferences.
- **Export potential:** Neighbouring markets in Central Asia and the Middle East offer additional demand for competitively priced, halal-certified toothpaste.

Product Portfolio – Phase 1 Launch

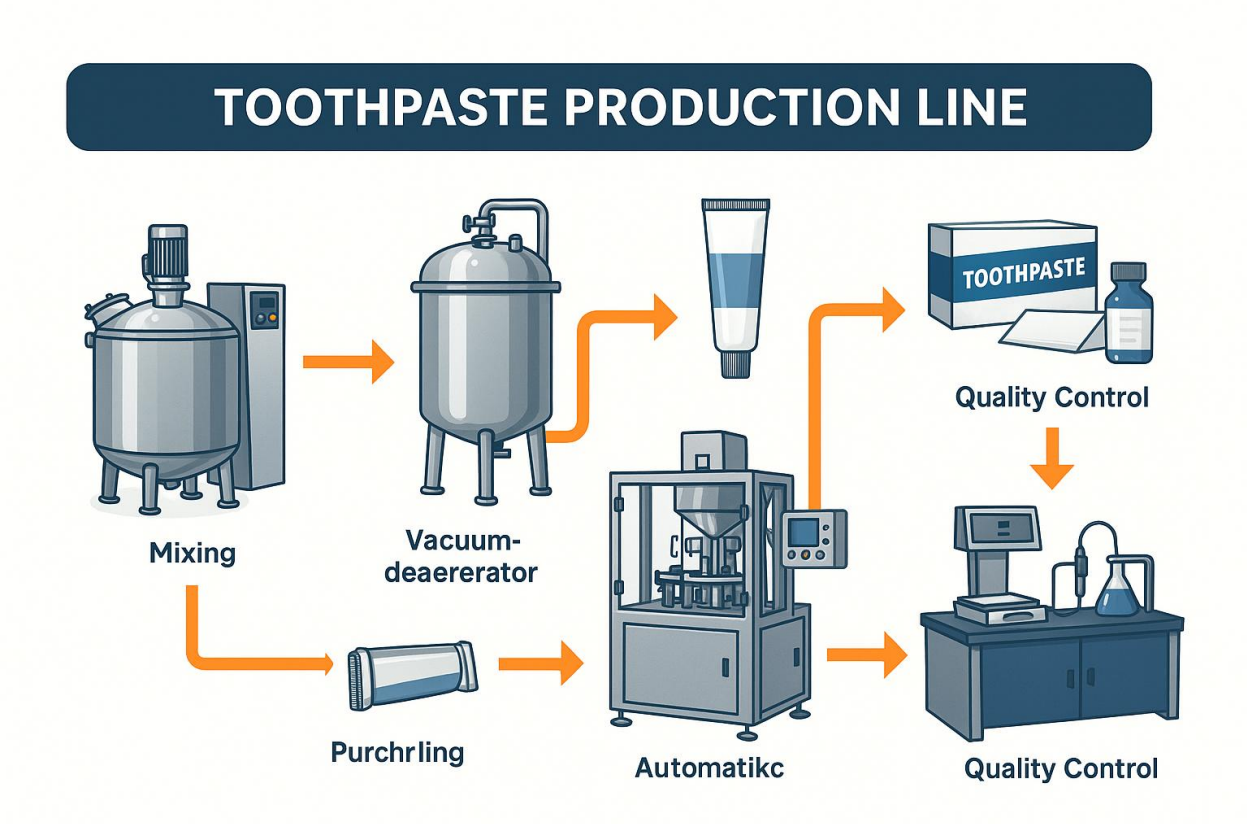
The initial product portfolio leverages the same core production equipment to manufacture multiple toothpaste varieties. Formulations can be adjusted for flavour, fluoride concentration, abrasives and colour while using one fused production line.

Product Line	Key Features	Target Market	Typical Price Range
Standard Fluoride Toothpaste	Classic mint flavour; contains fluoride to prevent cavities and calcium carbonate abrasives for cleaning.	Mass-market families	US $1.50 – $3.00 per 100 g tube
Whitening & Herbal Toothpaste	Enhanced silica abrasives; herbal extracts (green tea, neem) and whitening agents; premium tube design.	Health-conscious & premium consumers	US $2.50 – $5.00 per 100 g tube
Kids' Toothpaste	Mild fluoride levels; fun flavours (strawberry, bubble gum); colourful packaging; cartoon characters.	Children aged 3–12	US $1.20 – $2.50 per 75 g tube
Herbal & Natural Toothpaste	Formulations with plant extracts (clove, miswak) and xylitol; no artificial sweeteners; halal-certified.	Traditional & herbal consumers	US $2.00 – $3.50 per 100 g tube
Medicated & Sensitivity Toothpaste	Active ingredients like potassium nitrate and strontium chloride; reduces sensitivity; anti-bacterial agents.	Adults with gum/sensitivity issues	US $3.00 – $6.00 per 100 g tube

Each product can be customised in flavour, colour, fluoride content, sweetener levels and packaging formats (aluminium laminate, plastic or recyclable tubes).

Manufacturing Process Flow

Production is organised into a continuous flow from raw material mixing to packaging and quality control. The line integrates all stages into a single system to minimise handling and contamination.



Toothpaste production flow illustration

Process Flow Summary

Step	Process Name	Key Equipment	Main Parameters
1	Raw Materials Mixing & Premixing	**Vacuum mixing tank / high-shear mixer**	Blend water, humectants (sorbitol, glycerin) and hydrophilic colloids for 15–30 minutes. Maintain temperature 40–60 °C. Dispersers provide 5.5 kW shear and 970 rpm.
2	Vacuum Homogenisation & Emulsification	**Vacuum homogeniser**	Vacuum pump removes air to < 0.09 MPa; high-shear agitators and scrapers homogenise ingredients and dissolve abrasives for 30–40 minutes, producing a smooth paste.
3	Degassing & Storage	**Vacuum degassing tank /**	After homogenisation, the paste is cooled and pumped into a sealed storage tank.

Step	Process Name	Key Equipment	Main Parameters
		storage tank	Capacity ~300 L with CIP spray ball and air filter. Degassing removes entrapped air and allows conditioning.
4	Tube Filling & Sealing	**Automatic tube filling & sealing machine**	Fills tubes of 10–200 mL; handles plastic, laminate or aluminium tubes of 16–50 mm diameter. Capacity 20–50 tubes/min and includes level sensor, hot-air sealing and embossing for batch/date.
5	Packaging & Cartoning	**Automatic cartoning machine**	Inserts sealed tubes into pre-formed cartons, glues or tucks flaps and prints codes. Capacity ~30–60 cartons/min.
6	Quality Control & Inspection	**QC laboratory instruments**	Checks pH (6.5–7.5), viscosity (70–100 Pa·s), fluoride content (1000 ppm for adult formulations), particle size and microbial load. Also verifies tube seal integrity and net weight.

Detailed Process Descriptions

Step 1 – Raw Materials Mixing & Premixing

To begin production, purified water, humectants (sorbitol or glycerin), binders (carboxymethyl cellulose), abrasives (calcium carbonate or silica) and other liquid ingredients are weighed and added to the **vacuum mixing tank**. High-shear dispersers and a 3 kW main blender mix the components until a uniform suspension is formed. Steam heating maintains the temperature around **40–60 °C**, ensuring thickeners dissolve completely. Premix tanks hold additional liquid phases that are fed into the main tank. This step produces a hydrated base ready for homogenisation.

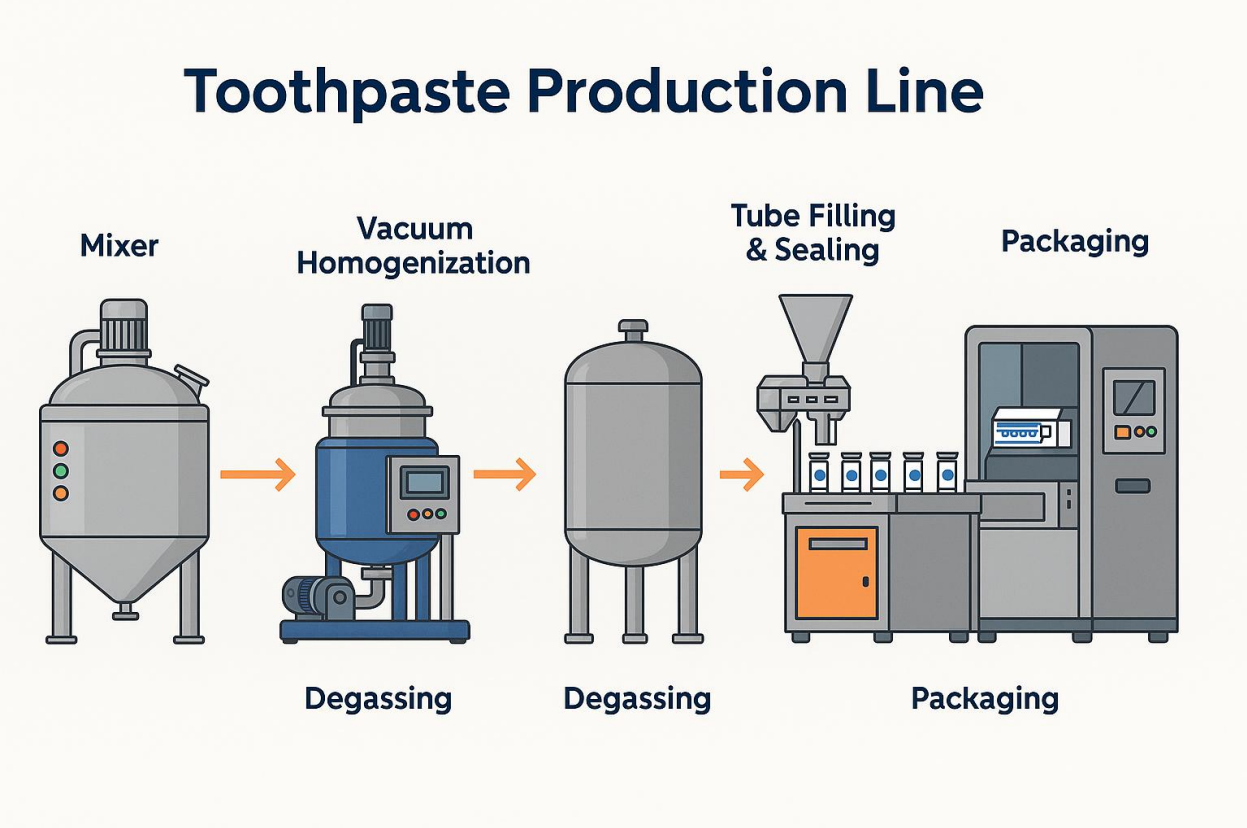
Vacuum mixing tank used for premixing and homogenisation

Step 2 – Vacuum Homogenisation & Emulsification

Once the base mixture is prepared, powders (abrasives, active fluoride compounds) and flavours are added gradually while the tank is under vacuum. A **water-ring vacuum pump** maintains low pressure to eliminate air bubbles and prevent oxidation. Two **high-shear dispersers (5.5 kW)** rotate at ~970 rpm, breaking down particles and emulsifying oils and surfactants into the aqueous phase. Scrapers prevent material build-up on the tank walls, and hydraulic lifts raise the dispersers for cleaning. After homogenisation, the paste achieves its characteristic smooth, glossy texture.

Step 3 – Degassing & Storage

The homogenised paste is pumped into a **sealed storage tank** equipped with CIP spray balls and an air filter. This **300 L movable tank** allows the toothpaste to rest, cool and degas further before filling. A level sensor monitors the volume and signals the automatic filling machine when replenishment is needed. Maintaining vacuum ensures no entrapped air, which would otherwise cause tube collapse or leakage during filling.



Degassing and storage tank used after homogenisation

Step 4 – Tube Filling & Sealing

From the storage tank, the toothpaste is transferred by a hygienic pump into the **automatic tube filling and sealing machine**. Empty laminate or plastic tubes are automatically oriented and fed into the turret. Multiple nozzles inject the paste to a precise volume (10–

200 mL), after which hot air softens the tube end and crimping jaws seal it. The machine imprints batch numbers and expiry dates in the seal area. Capacities range from **20–50 tubes per minute**, accommodating different tube diameters (16–50 mm) and weights (15–130 g). Quick-change parts allow product changeovers.

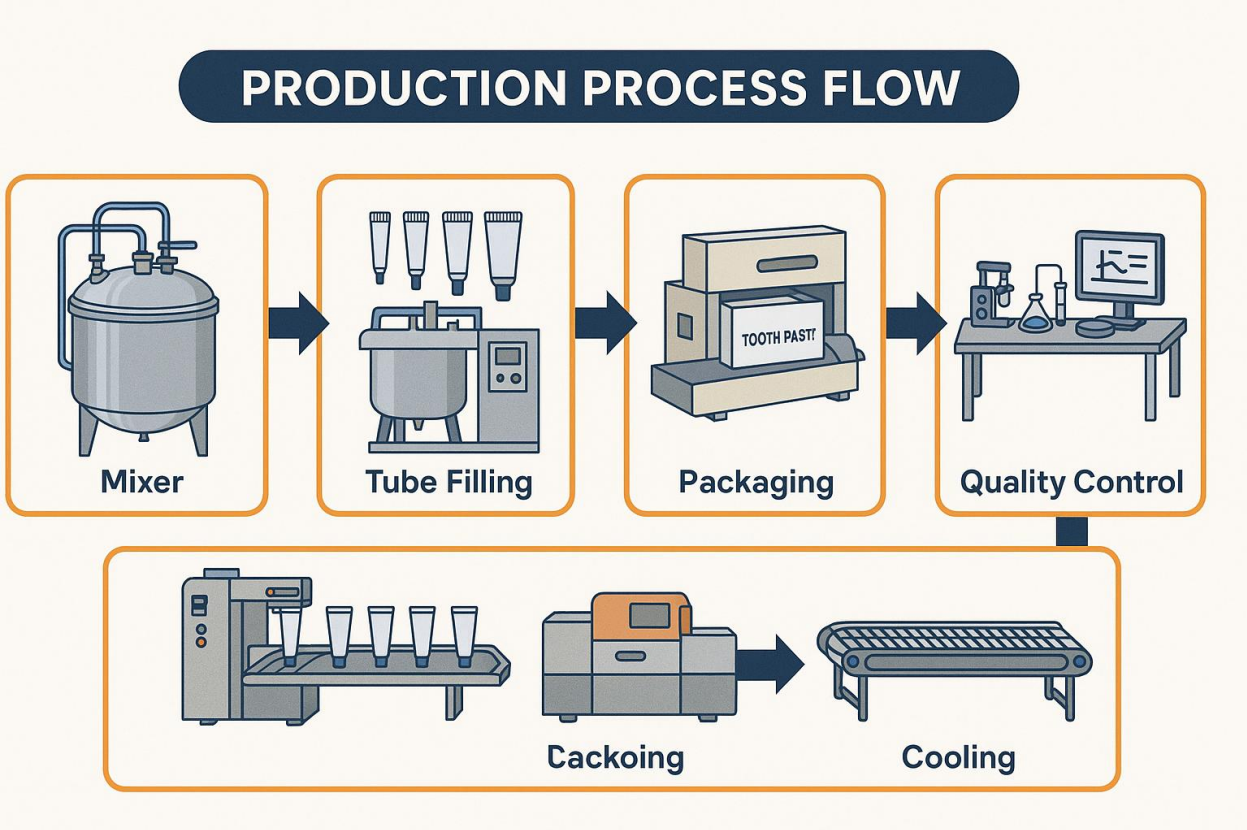
Cartoning machine for packaging toothpaste tubes

Step 5 – Packaging & Cartoning

Sealed tubes are conveyed to the **automatic cartoning machine**, which forms cardboard boxes, inserts the correct number of tubes, applies glue or tucks flaps, and prints codes. Sensors verify that each carton contains the right number of tubes and reject incomplete packages. This unit typically handles **30–60 cartons per minute** depending on box size. Finished cartons are then case-packed and shrink-wrapped for distribution.

Step 6 – Quality Control & Inspection

Quality control is integrated at multiple points. Operators collect samples from the storage tank and finished tubes to test **pH**, **viscosity**, **fluoride concentration** and **microbial counts** in a dedicated laboratory. Instruments such as pH meters, viscometers, fluoride ion selective electrodes, microscopes and balances ensure the product meets regulatory specifications. Metal detectors or X-ray scanners check sealed tubes for foreign materials. Only batches that meet all parameters proceed to the warehouse.



Quality control laboratory with pH meter, viscometer and lab instruments

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Raw Materials Requirements

The formulation of toothpaste typically includes the following ingredients:

- **Abrasives (25–40 %)** – calcium carbonate, calcium phosphate or hydrated silica to remove plaque and stains.
- **Humectants (20–30 %)** – sorbitol, glycerin or polyethylene glycol to keep the paste moist and prevent drying.
- **Water (15–25 %)** – purified water, processed through reverse osmosis.
- **Binders/Thickeners (1–2 %)** – carboxymethyl cellulose (CMC), carrageenan or xanthan gum for viscosity and stability.
- **Surfactants (1–2 %)** – sodium lauryl sulfate or sodium lauroyl sarcosinate to create foam and disperse debris.
- **Active agents (0.2–1 %)** – sodium fluoride or sodium monofluorophosphate for cavity protection; additional agents such as triclosan or potassium nitrate for specific formulations.
- **Flavourings & Sweeteners (0.5–1 %)** – peppermint or spearmint oil, menthol, saccharin, xylitol.

- **Colourants & Preservatives (trace)** – titanium dioxide for whiteness; sodium benzoate or parabens to prevent microbial growth.
- **Packaging materials** – laminate or aluminium tubes with caps, printed cartons, and outer shipping boxes.

Cost analysis: Typical production cost, including raw materials and packaging, ranges from **US $0.30 – $0.60 per 100 g tube**, depending on formulation and scale. Retail prices in regional markets range from **US $1.50 – $3.00**, allowing attractive gross margins.

Investment Summary & Returns

Component	Low Range (US)|$HighRange(US)$	Notes	
Vacuum mixing & homogenising system	20 000	45 000	Includes 200–500 L vacuum mixer, high-shear dispersers, vacuum pump and control panel.
Storage & Degassing Tank	5 000	10 000	300 L movable tank with CIP, vacuum and level sensor.
Tube Filling & Sealing Machine	15 000	30 000	Handles 20–50 tubes/min; equipped with hot-air sealing and date coding.
Cartoning & Packaging Line	20 000	30 000	Automated cartoning, code printing and shrink-wrap unit.
Utilities & Water Treatment	8 000	15 000	RO water purification system, air compressor and chilled water supply.
Installation & Training	5 000	8 000	Includes engineer travel, installation, commissioning and operator training.
Working Capital	30 000	40 000	Covers raw materials, packaging and first 3 months' operations.
Total Investment	**80 000**	**150 000**	Aggregate of equipment, installation and working capital.

Timeline:

1. **Months 1–2:** Design finalisation and manufacturing of customised equipment.
2. **Month 3:** Shipping, customs clearance and factory preparation.
3. **Month 4:** Installation, utilities connection and commissioning.
4. **Month 5:** Trial production, calibration and staff training.

5. **Month 6:** Commercial launch and product distribution.

Return on investment: Assuming one shift at 70 % capacity, the project is projected to break even within **12–24 months**, with profitability increasing as brand recognition grows and production expands to new variants.

Quality Standards & Compliance

To compete with imported brands, the production line must adhere to international and national standards:

- **Good Manufacturing Practice (GMP) & ISO 22716:** Ensures hygiene, traceability and quality control for cosmetic products.
- **HACCP & ISO 22000:** Hazard analysis and food-safety management to identify critical control points and prevent contamination during mixing, filling and packaging.
- **Halal Certification:** Vital for Muslim markets; confirms all ingredients and processes are halal compliant.
- **Fluoride Regulations:** Complies with national health regulations on fluoride content in toothpaste (typically 1000 ppm for adults; lower for children). All active ingredients must be approved by health authorities.
- **Environmental & Safety Compliance:** Ventilation, waste management and chemical handling procedures meet national environmental standards.

Conclusion & Next Steps

Launching a **toothpaste production line** in Afghanistan represents a lucrative opportunity to supply a growing oral-care market, reduce dependence on imports and create high-quality products tailored to local preferences. With Sanaatchi Industrial Vision's turnkey expertise, investors can confidently establish a modern, GMP-compliant facility that delivers consistent quality and profitability.

Next steps:

1. Schedule an initial consultation to discuss capacity requirements and custom features.
2. Receive a detailed proposal tailored to your formulation and packaging needs.
3. Conduct a site assessment to verify utilities (water, electricity, compressed air) and layout.
4. Finalise equipment order, contract and timeline.
5. Proceed with manufacturing, installation and commissioning to begin production within six months.

Contact Information

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