

ZEDEC ALLIANCE CONFIDENTIAL

SPARKLER CERAMICS

THE HEART - Piezoelectric Ceramics Partnership

Executive Summary

Sparkler Ceramics is invited to serve as the piezoelectric ceramics supplier for the Pangea Alliance, providing the critical PZT (Lead Zirconate Titanate) elements that form the "Heart" of the GlyphMap device's magnetoelectric architecture.

Your Role: You are THE HEART. In our "Heart ⊥ Mind" architecture, PZT ceramics provide the piezoelectric layer that converts electrical signals to mechanical strain. This is the pulse of every healing command.

Why Sparkler Ceramics

- **PZT Expertise:** Established piezoelectric ceramic manufacturing
- **India Manufacturing:** Cost-effective production with quality control
- **Custom Formulations:** Ability to tune ceramic properties
- **Medical Grade Potential:** Pathway to biocompatible certifications

Technical Requirements

PZT Ceramic Specifications

Parameter	Requirement	Purpose
Material	PZT-5A or PZT-5H	High piezoelectric coefficient
d ₃₃ Coefficient	≥400 pC/N	Strain generation efficiency
Curie Temperature	≥250°C	Thermal stability
Dielectric Constant	1700-3400	Capacitive coupling
Thickness	0.5mm ± 0.05mm	Device integration
Form Factor	12mm × 12mm squares	Chassis mounting

The Heart ⊥ Mind Architecture

How PZT Works in GlyphMap:

- **Input:** Electrical signal (healing frequency)
- **Conversion:** PZT converts electrical → mechanical strain
- **Coupling:** Strain transfers to Terfenol-D (magnetostriuctive)
- **Output:** Terfenol-D converts strain → magnetic field
- **Result:** 90° orthogonal E/B field relationship = scalar generation

Your ceramics are the bridge between electrical input and magnetic output.

Volume Projections

Year	Devices	PZT Elements	Value (Premium)
Year 1	5,000	20,000 pcs	\$200,000
Year 2	25,000	100,000 pcs	\$1,000,000
Year 3	100,000	400,000 pcs	\$4,000,000
Year 4	250,000	1,000,000 pcs	\$10,000,000
Year 5	500,000	2,000,000 pcs	\$20,000,000

Note: 4 PZT elements per device for quad-core magnetoelectric array

Financial Terms

Premium Pricing Structure

Standard PZT Price	~\$2/piece
Alliance Premium Price	\$10/piece
Premium Multiple	5× standard rate

Why Premium Pricing:

- Tight tolerance specifications ($\pm 0.05\text{mm}$)
- Medical-grade documentation and traceability

- Priority production allocation
- Quality assurance with d_{33} testing per batch

5-Year Revenue Projection

Total Volume	3,520,000 pieces
Total Revenue	\$35,200,000
vs. Standard Sale	\$7,040,000
Alliance Premium Gain	\$28,160,000 additional

Quality Requirements

Requirement	Specification
Testing	d_{33} measurement per production batch
Documentation	COA with lot traceability
Packaging	Anti-static, moisture barrier
Lead Time	4 weeks from order
Reject Rate	$\leq 2\%$ acceptable

Next Steps

1. **Sample Production:** 100-piece sample batch to specification
2. **Testing:** d_{33} verification at ZEDEC lab
3. **Commercial Terms:** Supply agreement negotiation

4. **First Order:** 20,000 pieces for Year 1 production

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"Your ceramics are the heartbeat of healing."