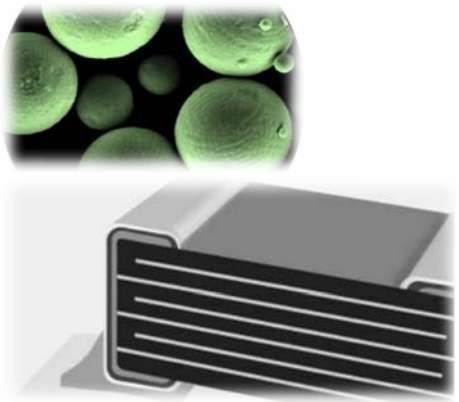
TITANIUM

ORES AND POWDERS FOR MLCC

World Markets in MLCC Ceramic Dielectrics
(Connecting Blockchain Node 8108)



Paumanok Publications, Inc. has established provenance in the 8532 HTS Code. Paumanok digital assets have been used for utility of mapping the supply chain in capacitors, resistors and inductors. This report is important because it documents a key Periodic Table Material known as Titanium, which is further mixed into barium titanate- the key ceramic dielectric material for all MLCC.

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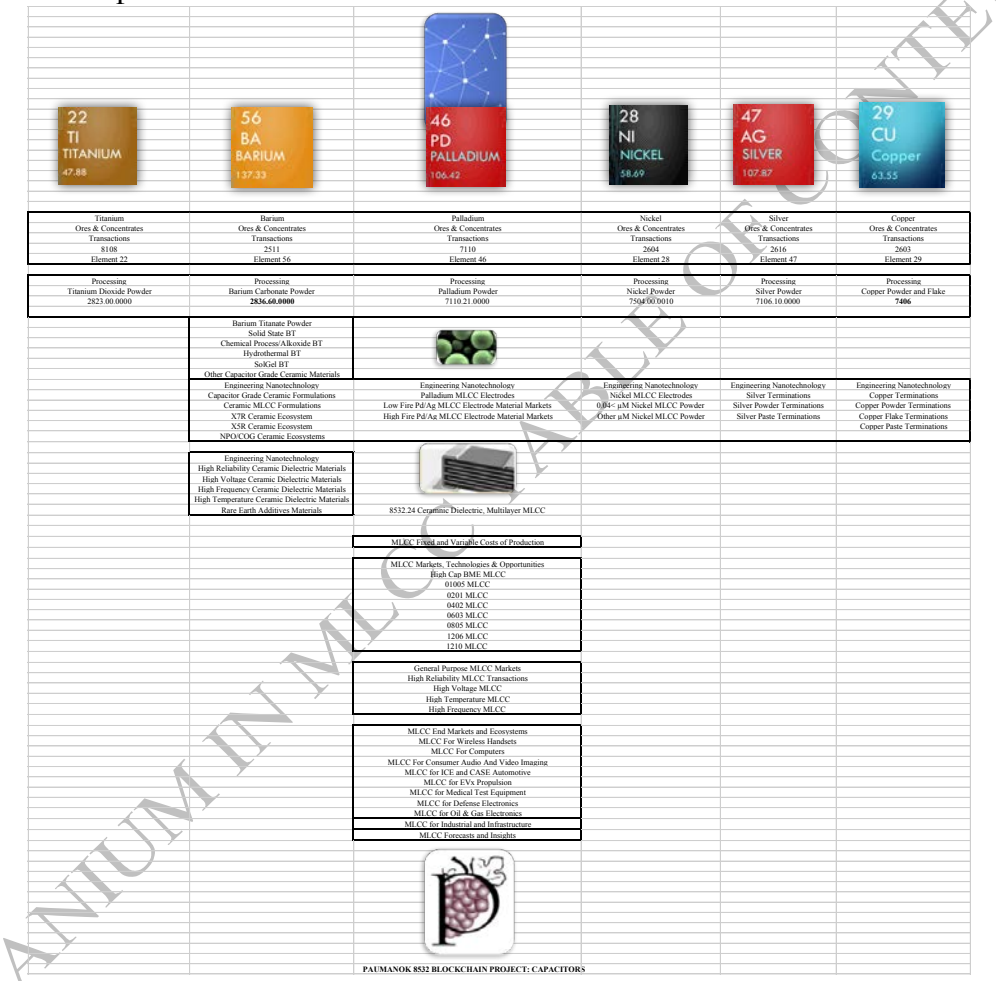
INTRODUCTION: This report identifies suppliers who are adding value to the electronic component supply chain through materials engineering, and establishes their market shares, operational locations, value, volume and pricing of materials, as well as Strengths, Weaknesses, Opportunities and Threats as it relates to the specific area of focus on the node of the blockchain.

Figure 1: Paumanok **ISBN# 1-89-3211-38-X Research: 1988 to Present Day** Description of The 8532 Capacitor Blockchain Project; Including Connections Between Components and Materials



Source: Paumanok Blockchain Project 2022

Paumanok Provenance in the 8532 HTS-Trade and Transactions- CAPACITORS- : All 300 Technical-Economic deep dive analysis (In PDF or NFT Minted Format) in the collection are written by Dennis M Zogbi and are considered digital assets covering granular relationships in the 8532 and 8533 Harmonized Tariff Schedule (Blockchain) for ubiquitous electronic components consumed in all electronic devices connected to the feedstock raw materials required for their manufacture. The founder has been a keynote speaker at multiple industrial conferences worldwide; a key member of electronic industry association and is the columnist for Berkshire Hathaway's TTI Marketeye for 25 years and an on-site advisor for technology hedge funds that use the founder's blockchain formulas to invest in equities, commodities and futures. The founder has engineered blockchains for mergers and acquisitions, new product development, disruptive technologies, new markets and new cultures. Repeat customers over the past 30 years include brand name OEM, EMS and Financial Institutions in the USA, Japan, China, Germany, France, UK, Israel, Italy, Belgium, Slovenia, Korea ROK, Singapore, Thailand, Philippines; Australia, Indonesia and Iceland.

Paumanok IMR Utility in Global Capacitor Trade and Blockchain Engineering as a Service: : Paumanok Publications, Inc. Industrial Market Research has been in continuous business for 33+ years and has a global voice in the 8532 and 8533 sections of the International Harmonized Tariff Code and includes capacitors, resistors, magnetics and circuit protection; a blockchain representing trillions of pieces and tons of dielectrics, electrodes, anodes, cathodes and terminations that represent a significant number of transactions each year. The purpose of this project is to engineer roadmaps of transactions and establish links between keystone materials. Because of their utility as tools to profit from a blockchain based upon the 8532 and 8533 HTS Schedules (representing the largest volume products in units 4.4 trillion production starts expected for 2022- a supply chain that will benefit from blockchain over time).

Paumanok IMR Blockchain Roadmap in the HTS 8532 Global Trade: The project will make PDF's available and mint NFTs as digital assets and will be posted based upon links between chains in the 8532 and 8533 HTS codes. This will begin with MLCC (Ceramic Capacitors) and their support materials; followed by tantalum, aluminum, plastic, carbon; resistors, magnetics and circuit protection components. The collection will include Deep Dive Market Study Minted NFTs and Collectible Issues of Passive Component Industry Magazine.

Deep chains connect electronic materials to ores and feedstocks including bauxite, copper, nickel, palladium, silver, ruthenium, tantalum, barium, titanium, neodymium. Vertical chains link feedstocks, nanotechnology, engineered materials, matching materials, processing equipment and kilns, with kilns branching off into tunnel and batch type; as well as fired component bodies in case sizes established by the EIA in inches (and viewed overseas in millimeters). The passive components are ubiquitous components that are required and consumed in every electronic circuit, with clear paths to profitability

8532 Capacitor Global Community: The 8532 and 8533 HTS Codes contain a mapped out 300 manufacturers worldwide representing a community of 300,000 employees and $60 Billion USD in Revenues; while the larger segment of "Microelectronics" trade and transaction which

includes active semiconductor and passive components represents $700 Billion in worldwide electronic component production combined. This feeds into a myriad of component performance categories in general purpose, high voltage, high temperature and high frequency market segments, in the wireless handset, personal computer, automotive ICE, automotive EVx propulsion, consumer audio and video imaging and home theatre; defense, space, civil aviation, oil & gas, medical test equipment; medical implants, semiconductor manufacturing equipment, industrial power, infrastructure, networking, renewable energy systems and emerging technologies.

Related Paumanok 8532.2 MLCC Blockchain Reports

- Titanium in MLCC
- Barium in MLCC
- Palladium in MLCC
- Nickel in MLCC
- Silver in MLCC
- Titanium Dioxide in MLCC
- Barium Carbonate
- Barium Titanate
- Ceramic Dielectric Formulations
- MLCC Production Costs: Fixed and Variable
- MLCC Markets by Case Size

- MLCC Vendor Competitive Analysis, Factories by Country and Market Shares

- MLCC in Handsets
- MLCC in Computers
- MLCC in Auto ICE and CASE
- MLCC in Auto EVx Propulsion
- MLCC in Consumer Audio and Video Imaging
- MLCC in Industrial and Infrastructure
- MLCC in Defense Electronics
- MLCC in Medical Test Equipment
- MLCC in Space Electronics

- MLCC in Oil & Gas Electronics

- High Voltage MLCC Ecosystems
- High Temperature MLCC Ecosystems
- High Frequency MLCC Ecosystems

Prior Editions of This Report under Paumanok *ISBN# 1-89-3211-38-X (2021)*

Paumanok Publications, Inc. has been at the forefront of market research in passive electronic components and related materials for decades. Paumanok is employing the fundamental codes of the harmonized tariff schedules (HTS) as a basis for new Blockchain Codes for the 8532 channel. New codes are necessary to adequately describe supply chains and connect them with the materials and feedstocks they require.

To See These and Other Reports in PDF Format-

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About this report

This document addresses the global market for Multilayered Ceramic Chip Capacitors (hereafter referred to as MLCC)- their technologies and related feedstock and raw material supply chains.

When Science Meets Money

The critical scientific principal surrounding all Capacitor technology is that capacitance is equivalent to the physical size, or available surface area of the finished capacitor. This in turn makes the raw materials consumed in the production of Capacitors the most expensive portion of "Cost of Goods Sold," and the area where the application of best practices can have the greatest impact on decreasing the cost of goods sold and increasing operating margins.

Focus of This Specific Report

MLCC- Multilayered ceramic chip capacitors; the workhorse of the passive electronic component industry. Paumanok estimates that 4.4 trillion MLCC were produced in 2021, of which about 1.7 trillion will be consumed and 2 trillion will be materials work-in-process, and 0.4 trillion will be defective or go into stockpiles at key OEM, EMS and Distribution companies.

This report focuses specifically on consumption value, volume and pricing for Titanium Ti- Element 22) consumed as a fundamental keystone material to make ceramic dielectric materials used in multilayered ceramic chip capacitors. The report uses provenance of the publisher to establish the connection between the HTS 8532 and 8108 codes for blockchain purposes. The relationship between titanium and capacitors has been well documented for 70 years in "mass-produced" ceramic capacitor technology. This report creates a blockchain pathway that establishes titanium as a keystone material for MLCC production worldwide.

Research Methodology Employed:

The methodology employed to do this study combines secondary and primary data sources, including government data; company financial data and primary human intelligence resources to draw conclusions. This is called a "legacy" of data that is designed to make sure that all pieces of the market "puzzle" fit together. Also we have the unique capability to benchmark the markets we study with previous studies under the same title produced in the past two decades. This enables us to establish the "Delphi -Method" which suggests that the trend of sales over time will support a similar rate of growth in the future. We caveat this approach by also employing "Box-Jenkins" methods of market research which adjust forecasts based upon our knowledge of current events and their impact. Remember, Paumanok provides a unique market view based upon input from multiple resources in the supply chain, including dielectric materials, ores and concentrate resources; electrodes, terminations; equipment, stacking, winding; firing/furnaces; drying, wire winding; pressed pill, porous anode, polymer cathode resources both primary and secondary that give us a unique perspective. Paumanok views finance and component distribution as separate markets that create "value-added" from the process of supply and demand. Government is involved as well in the form of regulations, especially environmental, ITAR, mining and conflict minerals. Capacitors may in fact be