

DK 18- CERAMICS

DK-18 is a MgTiO_3 based ceramic, which is widely used as Patch Antenna substrates in Satellite and GPS communication systems. This dielectric, coming in the medium permittivity materials, possesses extremely low dielectric loss ($\tan \delta \sim 10^{-5}$) in microwave frequency ranges.

Electronic ceramics with high permittivity ($\epsilon_r > 20$) and low dielectric loss ($\tan \delta < 10^{-3}$) have a number of applications in microwave devices like filters, oscillators, multiplexers etc in terrestrial as well as Space communications systems ranging from UHF to mm-band frequencies. In such devices, it is desirable that the ceramics have high ϵ_r to confine the electromagnetic waves near them. However, when applications like antennas and substrates are considered, $10 < \epsilon_r < 20$ is desirable for better radiation field outside the ceramic and size reduction. Their advantages are small size, light weight, temperature stability etc. Globally, a few materials have been manufactured for use in specific range of microwave spectrum. This indigenously developed DK18 is equivalent to *Kyocera SM200* and *P series of Murata* that are used as substrates for GPS antennas.

Since the process temperatures are much lower than the tantalates and raw material cost is also low, the production cost of this ceramics is much lower compared to other similar products in the market. This ceramic also has the added advantage of having a low ϵ_r , only about a half that of tantalates.

Typical properties:

FOR FURTHER DETAILS PLEASE CONTACT:

TECHNOLOGY TRANSFER & INDUSTRY CO-ORDINATION DIVISION
VIKRAM SARABHAI SPACE CENTRE
INDIAN SPACE RESEARCH ORGANISATION
THIRUVANANTHAPURAM – 695 022
PH: +471 – 2564081, 2565133
FAX: +471- 2564134
E-MAIL: u_sreerexha@vssc.gov.in

TECHNOLOGY**FROM ISRO**

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|------------------------------------------------------------------------|-----------------|
| Appearance | Light cream |
| Bulk density (g/cc) | 3.7±0.15 |
| Open Porosity | Nil |
| Closed Porosity | <2% |
| Resistivity (Ω .cm) | 10^{13} |
| Coeff. of Thermal Expansion ($10^{-6}/K$) | 9.2 |
| Dielectric constant (ϵ_r) | 19±1.5 |
| Quality factor (Q_u @ GHz) | 12,000 (6.5) |
| Loss factor ($\tan\delta$, 10^{-5}) | 8.4 |
| Temp. coeff. of frequency (τ_f , ppm/K) | 0 ± 5 |
| TE _{01δ} resonator size at 5 GHz (D=2L, mm) | 14 |

VSSC is willing to offer the technology of DK18 ceramics to eligible interested parties who are in the field of manufacturing similar items

Interested entrepreneurs are requested to contact the address given below with all relevant particulars regarding their line of current activity, infrastructure available, market assessment of the product, financial arrangements made, turn over and sales of their products for the past years and a copy of their latest annual report.

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