



P. A. COLLEGE OF ENGINEERING AND TECHNOLOGY
(Accredited by NAAC with “A” Grade)



POLLACHI – 642 002

Department of Electronics & Communication Engineering
19-20 Even Semester
(Accredited by NBA)

INDUSTRIAL TOUR REPORT

ACE COMPONENTS & ELECTRONICS PVT. LTD.
AND
KAYNES TECHNOLOGY INDIA PVT. LTD.

ON

14.02.2020 & 15.02.2020

Total Number of Students: 56

Submitted by
III - ECE

ACE COMPONENTS & ELECTRONICS PVT. LTD.



INTRODUCTION ABOUT ACE COMPONENTS

Ace components was promoted in 1983 by a technocrat entrepreneur with rich experience in medium and large corporate and with technical training and participation from Japan. Right from inception the company established a full line for production of Carbon and Metal film resistors from film deposition to finished resistors, thereby having full control on the quality of the products.

Higher wattage lines and metal oxide lines were added to provide the customer with full range requirements of leaded film resistors.

The production facilities have been continuously updated to provide you with the best of quality, cost, delivery and service.

Ace resistors are tested for application requirements and relevant material and international standards.

All processes from order processing to delivery is fully automated to ensure error free and efficient handling of all orders and certified to ISO 9001:2000 standards.

A motivated multi skilled workforce with average experience of more than 15 years work on a Toyota Production Line model ensuring shortest delivery of complete orders with varied product mix.

Ace components customer base is mainly in the professional electronics segment catering to Defence, Telecommunications, Instrumentation and all applications requiring precision and reliable components. The market segments include Electronic Manufacturing Services (for both domestic and export), Telecom, Defence Electronics, Instrumentation, Electrical applications, high end UPS, Energy Metering, Electronic modules for branded consumer durables, Control Systems, Precision Electronic Weighing Systems, Medical Electronics, Machine Tool electronics and all other electronic applications.

PRODUCTS OF ACE COMPONENTS

Ace High Stability Carbon Film Resistors

Ace High Stability Metal Film Resistors

Ace Metal Oxide Film Resistors

Ace Zero Ohm Resistors

Ace Flame Proof Resistors

Ace High Stability Carbon Film Resistors

TYPE - CA

Construction:

Ace high stability Carbon Film Resistors are coated with a thin film of highly pure carbon on high alumina ceramic rods by pyrolysis, under controlled conditions. The final ohmic value is achieved to close tolerances by uniformly helixing on precision imported machines using low IRV, to ensure high stability and long life. The lead wires are welded to the end caps with Electro Tinned Copper wire, weld strength tested online, pulsed to withstand short term overload, coated with multiple layers of epoxy and colour coded with four colour bands (E-24 Series) to international standards.

Features:

High stability

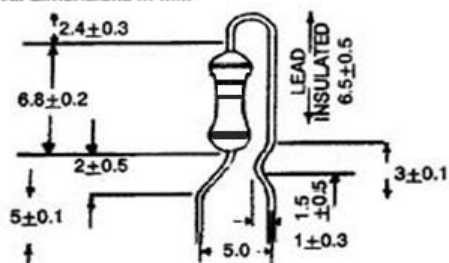
Long service life

Low noise special epoxy coating for protection and insulation against severe tropical exposure and moisture.

Small size

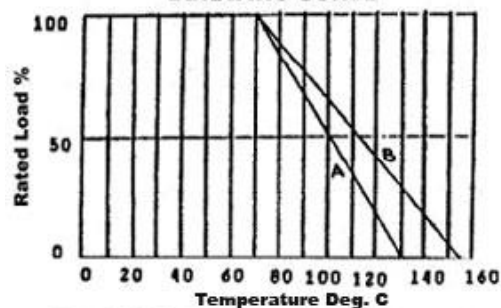
VERTICAL FORMED RESISTOR

All dimensions in MM



Vertical formed resistors CA in bulk packing for 1/4W, miniature 1/2W and 0 ohms

DERATING CURVE



Curve B for CA 25, CA 50 / Curve A for CA 01, CA02 & CA03

Ace High Stability Metal Film Resistors

TYPE - MA

Construction:

Nickel Chromium alloy deposited by sputtering process on high alumina ceramic rods.

The film is fully stabilized to ensure long life and reliability. Fine helixing is done to get accurate values. Axial leads made of high conductivity Electro Tinned Copper wire are welded to the pressed end caps to ensure rigid construction. Multiple layers of light blue color epoxy is coated to ensure high insulation, voltage proof and protection against severe tropical environmental conditions.

Features:

Very high stability and reliability

Low TCR

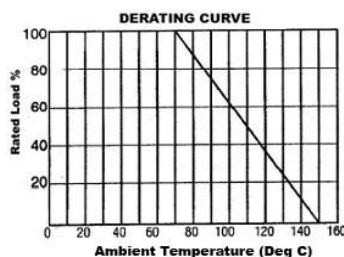
Low noise level

Excellent high frequency characteristics conforms to MIL and JSS specifications

Approved by LCSO, C-DOT and most user organizations

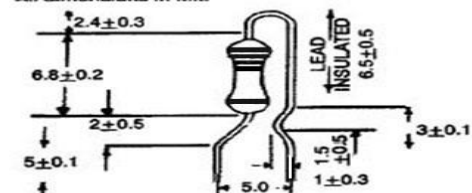
Characteristics:

| | |
|--|----------------------------|
| 1. Short time overload | $\pm 0.5\%$ |
| 2. Damp heat (56 days) | $\pm 1\%$ |
| 3. Load life stability 2000 hrs at 70 °C | $\pm 2\%$ |
| 4. Temperature cycling | $\pm 0.25\%$ |
| 5. Resistant to solvent | No color bands going off. |
| 6. Insulation resistance | Minimum 10,000 M.ohms |
| 7. Resistance to soldering heat | $\pm 0.25\%$ |
| 8. Dielectric strength | 2xwork. Volt. No breakdown |
| 9. Solderability Good tinning | 95% coverage |
| 10. Temperature limits | T 65/150 (-65°C to +150°C) |



VERTICAL FORMED RESISTOR

All dimensions in MM



Vertical formed resistors MA in bulk packing for 1/4W, miniature 1/2W and 0 ohms

Ace Metal Oxide Film Resistors

TYPE - MA (O)

Construction:

Ace Metal Oxide Resistors offer excellent performance in applications where stability and uniformity of characteristics are desired. Metal oxides can also replace many wire-wound applications. Ace Metal Oxide Resistors are protected by special grade silicon resins to ensure rated power dissipation and long term stability.

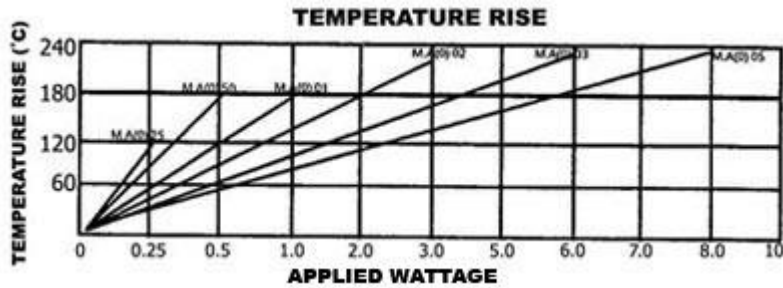
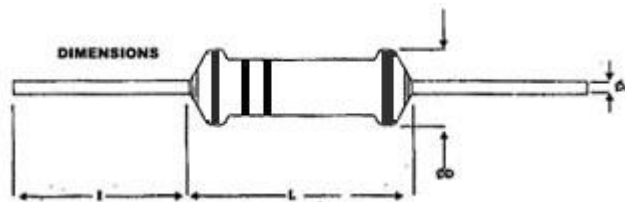
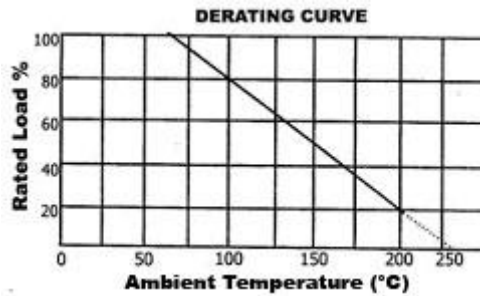
Features:

The special deposited conductive film on high grade alumina ensures controlled TCR and long term stability.

High Surge overload capability.

High Power-to-Size ratio for significant space saving

Complete flame proof construction.



Ace Zero Ohm Resistors

Construction:

Zero ohm resistors are basically interconnection component between two points on a P.C. Board.

The zero ohms resistors are a substitute to a jumper wire. These are very helpful when it is to be fed to an automatic component insertion machine.

The value of a zero ohm resistor will be < 0.007 ohms. Sizes available are in 1/4 watt & 1/2 watt dimensions.

Ace Flame Proof Resistors

Flameproof resistors are resistors of general type either CFR or MFR with a special type of SILICON EPOXY RESIN coat which helps in retarding the flame hence the name flame proof resistor.

PROCESSES INVOLVED

Production process:

Fully integrated automated manufacturing facility, from Film Deposition to finished resistors.



Quality Assurance:

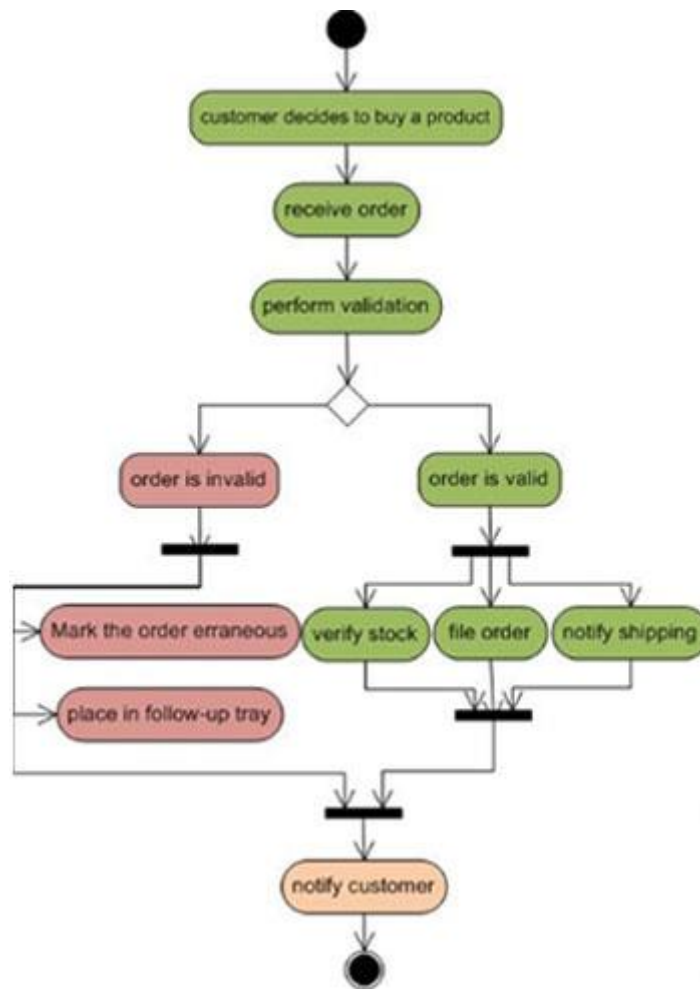
Fully equipped calibrated testing facility, from incoming materials, various stages of production (including 100% on-line checks) to final validation of process parameters.



Order Processing:

Fully computerised order processing (using proprietary software), including order acknowledgement, production scheduling, inventory allocation and invoicing.

PROCESS IN FLOWCHART



PROCEDURE INVOLVED IN PROCESSING

Carbonising

Carbonising processes done by Pyrolysis under controlled conditions-optimum batch size with parameters fixed using DOE ensures uniform coating and characteristics with reduced variations.



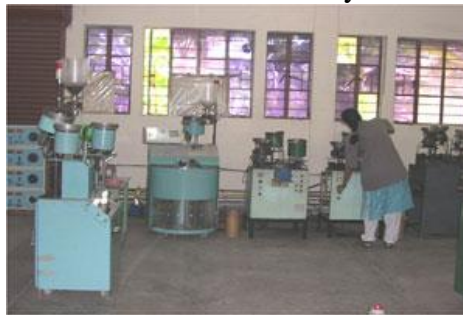
Metallising

Metallising process done by sputtering proprietary alloys under high vacuum ensuring excellent adherence, low TCR and uniformity.



Capping

End caps fixed to the coated rods. Dimensional accuracy ensured by SPC.



Sorting

Microprocessor controlled sorting ensures close grading of CFR/MFR capped rods there by ensuring uniform Helix cutting.



Helix Cutting

Resistance value performed on the sorted rods by helical grooving – pressure controlled cam operated precession grinding wheels. High magnification and uniform pitch ensures high stability and reliability of the resistor.



Lead Welding

Fully electroplated, oxygen free copper wire (Rohs compliant) spot welded to the resistors end caps. Burr free welding with excellent welding strength is ensured by the process.



Epoxy coating and colour coding:

Separate coating line for every size helps in speedy processing. Multilayer epoxy coat ensures hermetical sealing of the film to environment. Dual on line check to ensure accurate tolerance control. Universal Colour coding for value & tolerance Identification.



Packing (Bulk/Taping):

On line taping with 5mm/10mm pitch. Taping with 27mm and 52mm length making it suitable for auto inserting m/cs. Higher wattage resistors are taped offline. Bulk taping on customer request. Vertical formed resistors – bulk packing.

PHOTOGRAPHY



CONCLUSION & FEEDBACK

The industrial visit gave us lot of information about the various aspects of production and operation of a company. Industry visits sensitize students to the practical challenges that organizations face in the technical world. Industrial visits also give greater clarity about various technical concepts for students as they can practically see how these concepts are put into action.

It provides us an opportunity to learn practically through interaction, working methods and employment practices. Visiting a company gave us a practical perspective on the world of work. This site visit gave us chance to experience and learn what cannot be gained during lectures.

KAYNES TECHNOLOGY INDIA PVT. LTD.



INTRODUCTION ABOUT KAYNES

Kaynes Technology India Private Ltd, Mysore, India is a leading domestic player in the Electronics System & Design Manufacturing Services Space with Global foot print. Apart from its mother plant and additional manufacturing facility at Mysore it has five manufacturing plants at Bangalore, Chennai, Manesar, Parwanoo, and Selaqui.

Kaynes also has State of the Art Design and Development Centre (Kaynes Embedded Systems) at Bangalore for Embedded Design and Engineering services to support customers from Concept to Manufacturing.

Customers looking for Pre and Post warranty Component level Hardware Repair, Design Development, re-engineering and obsolescence management Services and Support, Kaynes has Electronic repair, Design and Re Engineering Centers at Mumbai. In addition to Mumbai, Kaynes has Centers at Bangalore, Delhi as well as at Cochin for Support Services.

Apart from products required for various industry segments Kaynes undertakes conceptual design, manufacture and testing of high reliability PCBAs, Box Build, Products and Systems Integration Services, Military Wire/Cable Harness for Defence and Aerospace Electronics and all other segments of Industry.

The Services offered by Kaynes mainly include Systems Design & Engineering, Equipment Installation and Commissioning including Support for On Board Systems, Overhauling and Maintenance of Electronic and Electrical Equipment's, Component level Electronic Card Repair and Re-Engineering/ Obsolescence Management, PLC Programming and System Commissioning and Systems Integration Activities.

Kaynes Technology is an ISO 9001/14001/18001 BSCI Certified Company making it one of the unique and leading EMS players in the niche business of Professional

Electronics with an integrated Management System in place. For each of the Sector Specific Verticals it has separate Certifications like EN/AS 9100 Rev D & Nadcap for Defence and Aerospace Products, IRIS for Railway Signaling, IATF 16949 for Automotive, ISO13485 for Medical Systems. Also for Electrostatic Discharge Control it is certified for ANSI S20.20 and IEC 61340-5-1. One of the rare companies in India to have undertaken this initiative and certified successfully.

MAJOR SERVICES BY KAYNES

- Electronic Design, Manufacturing, Products and Systems Integration Services
- Prototyping, Sourcing, Turnkey Manufacturing and Support Services of High Tech/High Mix , Medium Volume Electronic Product/Systems
- Manufacture of PCBAs, Box Building, Product and Systems Integration and OEM Manufacturing
- Assembly and Manufacture of Military Grade Cable/Wire Harnesses
- Design and Development of Embedded Products / Systems/FPGA based Systems
- Component level Hardware Repair, Design Development, re-engineering and Obsolescence Management Services and Support.

Kaynes Technology incorporate all life cycle service capabilities, qualifications, and certifications required by Defence and Aerospace Industry including design verification, validation service, conducting ESS & Durability tests as per MIL Standards.

BLUETOOTH MODULE PRODUCT:

Kaynes Technology Wireless Connectivity: Bluetooth® Modules

Bluetooth module enables the transfer of simple data between compact devices opening up a completely new class of Bluetooth applications such as watches, TV remote controls, medical sensors and fitness trainers, building an ecosystem using Bluetooth low energy (BLE).



Bluetooth low energy takes less time to make a connection than conventional Bluetooth wireless technology and consumes approximately 20 times less power than

Bluetooth Basic Rate. Kaynes Technology is the only Indian company to make first Bluetooth modules on CSR based chipset in India.

Bluetooth Technology Built-In Ready-to-use Modules : Manufactured to handle a broad range of technologies, Kaynes Technology's Bluetooth modules can be designed into various types of electronic devices.

Features include:

- High Data Rates
- Reduced Power Consumption
- Rapid Connection and Disconnection
- Seamless Transition from Bluetooth Classic to Bluetooth Low energy (SMART) In dual Mode module

THE MAJOR SECTORS SERVED BY KAYNES

DEFENCE & AEROSPACE



Kaynes Technology with its more than 27 years of electronics manufacturing experience has been in the Defence & Aerospace segment since last 8 years. It is the “Most Preferred Supplier” to Bharath Electronics Ltd (BEL) one of the “NAVARATHNA COMPANIES” of India. Kaynes has two manufacturing facilities certified for AS/EN 9100. Kaynes infrastructure adheres to IPC 610 Class 3 standards, which is good for all aerospace manufacturing. Kaynes facility is also ANSI S20.20 and IEC 61340 certified. There are also IPC trained lead auditors available in house.

RAILWAYS AND OTHER TRANSPORTATION



Kaynes has been manufacturing for most of the OEMs in the Railway & Metro Signaling since 2002. It first started its association with Union Switch & Signal inc a USA company for whom it started manufacturing all interlocking systems for the Global market. Kaynes has been validated and approved for manufacturing of Safety Integrated Level (SIL) 4 Sub Systems, the highest.

Kaynes manufactures all types of signaling equipment for various OEMs on Turnkey basis on long term contracts. It also has the competency to design and manufacture Power Distribution Cubicles for the OEMs. Kaynes is now building On Board equipment's for both the Metro and Railway market in domestic as well global markets. It is a Strategic supplier and a Global manufacturer of products to the OEMs.

Kaynes was the first Indian company to be certified for International Railway Standard (IRIS) in 2008 itself, way ahead of its OEM integrators.

HEALTH CARE



Kaynes has been in the medical segment since 1995 through manufacturing of Patient Monitoring systems for a marquee OEM. It is ISO 13485 certified and has also been audited by FDA of USA. Kaynes is manufacturing complex diagnostic & lab testing equipment's for both domestic and exports market. It is planned to have clean room of Class 100,000 by 2016.

AUTOMOTIVE



Kaynes being an EMS company is a tier 2 supplier to the well-known OEMs like Honda, Maruthi, Yamaha etc. It is having a Strategic partnership with a leading Cluster Manufacturer based overseas and thru this company is supplying to most of the OEMs in India as well as for exports. Currently there are three facilities which are certified for IATF 16949 standards. These facilities are spread across India and provide Business Continuity to the customer.

Kaynes also manufactures sub-assemblies using LED like tail lamps etc. Kaynes understands the JIT concept and all the facilities have their own APQP/PPAP trained skill sets to take the product thru design, prototyping, pilot and manufacturing phases.

IT & TELECOM



Kaynes has been manufacturing PCBAs for Printer companies since last 12 years. It is an approved Independent Hardware Vendor for a fortune 500 company in the Information Technology segment. In this segment, Kaynes supports embedded design thru its subsidiary company KEMSYS and is aligned to bring a product to life from concept stage itself.

POWER & ENERGY & INDUSTRIAL AUTOMATION & CONTROLS



Kaynes has been in this segment since its inception. It was certified for ISO 9000 way back in 1995 itself. All facilities of Kaynes Technology are certified for ISO 9001.

PHOTOGRAPHY



CONCLUSION & FEEDBACK:

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