

# **Your Trusted Partner**

**Experts in Construction Materials Testing, Inspection and Consultancy** 

# **ABOUT US**



#### **Building Excellence Since 1983**

R.A.K. Materials Consultant Pte Ltd is a locally owned company with over 40 years of expertise in the construction and civil engineering sectors in Singapore. Since becoming a subsidiary of Asia Laboratories Pte Ltd in 2018, we have strengthened our commitment to providing unparalleled testing and consultancy services.

#### **Recognized Accreditation**

We are recognized by the Building and Construction Authority (BCA) as an authorized analyst in aggregate testing. Our laboratory operations are accredited by the Singapore Accreditation Council-SINGLAS (SAC-SINGLAS) under ISO/IEC 17025. Additionally, we serve as a certification body under ISO/IEC 17065 and IAF Guidance on the application of ISO/IEC Guide 65, along with SAC CT 05-SAC Criteria for Certification Bodies (Ready-Mixed Concrete). This comprehensive accreditation guarantees our adherence to the highest quality benchmarks recognized globally.

#### **Comprehensive Services**

Our team comprises highly trained professionals equipped with state-of-the-art analytical equipment. We offer a wide range of services, including:

- Research & Development
- Consultancy on building materials, coatings, polymers, plastics, and environmental materials
- Quality Testing across civil engineering, chemical, environmental, and mechanical fields

#### **Tailored Solutions for Your Needs**

At R.A.K., we are dedicated to delivering exceptional testing, inspection, and consultancy services that are tailored to meet your specific requirements. Our cutting-edge technology and comprehensive understanding of industry standards enable us to support your projects effectively. We strive to be your trusted testing partner, ensuring quality and reliability at every stage.

# **VISION AND MISSION**



#### **Vision**

The leading trusted partner in testing, inspection and consultancy for construction materials.

#### **Mission**

To continuously enhance our services, ensuring we meet and exceed evolving industry standards, while providing tailored solutions that drive success and quality in every project.

### **Core Values**



# **OUR SERVICES**





Mechanical Engineering

Product Certification

Site Services & Consultancy





### Your Ultimate Partner for Quality, Testing, and Expertise

At R.A.K. we pride ourselves on being more than just a service provider — we are your dedicated partner in ensuring quality, safety, and innovation. Our all-encompassing platform offers a unique blend of Materials, Chemical, Mechanical, and Environmental Testing, tailored to meet the stringent demands of today's industries.

Our services extend to Ready-Mix Concrete Certification, ensuring your projects meet the highest standards throughout every phase of development. Our Consultancy Services for special projects bring unparalleled expertise and custom solutions for complex challenges.

Whether you are developing groundbreaking infrastructure or fine-tuning specialized products, our flexibility and professionalism ensure we meet your needs — ensuring timely delivery and cost efficiency

# **CIVIL ENGINEERING TESTING**

At R.A.K. Materials
Consultants, we take
pride in being an
accredited laboratory
that offers a full
spectrum of
construction materials
testing. We adhere to
the highest standards,
conducting tests in
accordance with SS,
ASTM, ISO, BS, EN, and
our own in-house
methods.

Our state-of-the-art, fully equipped laboratory provides comprehensive testing and analysis for aggregates, concrete, cement, admixtures, repairs, and building materials.

Our highly skilled engineers go beyond testing by offering professional advice and technical support. Their expertise in the properties and composition of construction materials ensures that every project we support reaches its full potential, resulting in high-quality, durable outcomes.





















# **SOIL & AGGREGATES TESTING**







#### **Geometrical**

- Grading (Particle Size Distribution)
- Fines Content
- Fines Quality
- Shell Content
- Angularity Number
- Particle Shape Index
- Flakiness & Elongation Index
- Percentage of Fractured Particles
- Flat and/or Elongated Particles

### **Physical**

- Moisture Content
- Los Angeles Abrasion
- Abrasion Value
- Crushing Value
- Impact Value
- 10% Fines Value
- Bulk Density
- Particle Density & Water Absorption

#### Chemical

- Chloride Content
- Sulphate Content
- Humus Content
- Fulvo Acid
- Loss on Ignition
- Potential ASR (Chemical Method)
- Lightweight Organic Contaminator



### **Durability**

- Soundness
- Drying Shrinkage



### **Specialist**

- Petrographic Examination
- Alkali-Silica Reactivity by Accelerated Mortar Bar and Concrete Prism

We provides a comprehensive range of physical, mechanical, and chemical properties testing on aggregate sample using BS, BS EN, and ASTM standards.

# **SOIL & AGGREGATES TESTING**



#### **Geological Inspection**

In light of restrictions on the supply of aggregates from existing sources into Singapore, testing and evaluating the quality of aggregates from foreign sources has become essential. R.A.K. is here to help ensure that the aggregates you source are suitable for use. We offer comprehensive geological inspections at quarry sites, including:

- New source assessment
- Specification compliance
- Comparison between materials
- Quality control
- Prediction of in-service behaviour



#### **Imported Aggregates Testing**

Early 2007, the Building and Construction Authority (BCA) of Singapore has implemented a rigorous three-stage testing regime for imported aggregates to ensure their quality. As an authorized analyst, R.A.K. offers comprehensive testing services that meet BCA requirements, including:

- Petrographic Examination (ASTM C295)
- Alkali-Silica Reactivity Mortar Bar Method (ASTM C1260)
- Water-Soluble Chloride (EN 1744-1, Clause 7)
- Acid-Soluble Sulphate Content (EN 1744-1, Clause 12)



#### Reclamation Sand Testing

Large-scale land reclamation has been a vital part of Singapore's development since the 1960s. At R.A.K., we are proud to offer specialized reclamation sand testing services to ensure the quality and suitability of your materials. Our comprehensive testing includes:

- Sieve Analysis
- Silt Content & Coral Content
- Organic Matter Content
- Angle of Shearing Resistance
- 12 Heavy Metals Analysis

# **CONCRETE TESTING**







# Hardened Concrete Testing

- Density
- Water Absorption
- Compressive Strength
- Water Permeability
- Flexural Strength
- Modulus of Elasticity
- Tensile Splitting Strength
- Water Penetration
- Initial Surface Absorption
- Chloride & Sulphate Content
- Composition (Cement Content)
- Drying Shrinkage
- Carbonation Depth
- Sulphate Resistance
- Coefficient of Permeability
- Rapid Chloride Permeability
- Steel Fibre Reinforced Concrete

# Fresh Concrete Testing

- Sampling
- Slump test
- Flow table test
- Air Content Test
- Density Test
- Setting Time
- Slump-flow
- V-funnel
- L Box
- Sieve Segregation
- J ring

### <u>Admixture</u> <u>Testing</u>

- Water Reduction
- Compressive Strength
- Air Content-Pressure Method
- Increase in Consistency
- Retention of Consistency
- Bleeding
- Setting Time
- Capillary Absorption
- Effective Component
- Absolute Density
- pH Value
- Alkali Content
- Silicon Dioxide Content
- Water Soluble Chloride
- Conventional Dry Material Content

At R.A.K. Materials Consultants, we understand that ensuring the quality of concrete is a critical part of every construction project's quality control and adherence to regulatory standards. We offer a full range of concrete testing services to meet these needs. Our capabilities extend beyond just testing fresh and hardened concrete. We also provide:

- Mix Design Assessment: Ensuring your concrete mix is optimized for strength, durability, and performance.
- Admixture Testing: Evaluating the properties of concrete additives to enhance performance in your specific application

# **ASPHALT PREMIX TESTING**





- Bitumen Content
- Marshall Density
- Marshall Stability
- Grading Analysis
- Skid Resistance
- Macrotexture Depth
- Los Angelas Abrasion
- Density of Cored Sample
- Thickness of Cored Sample



At R.A.K. Materials Consultants, our dedicated pavement testing laboratory, staffed by experienced engineers and technicians, is equipped to perform comprehensive asphalt premix tests. We help ensure that your asphalt premix meets compulsory regulations and adheres to the highest quality control standards.

#### Our services include:

- Basic Pavement Tests: Conducted on laboratory-prepared samples to guarantee mix performance.
- Site Sample Evaluations: Testing specimens collected directly from the construction site to ensure real-world compliance.

# **BUILDING MATERIALS TESTING**



### **Building Materials**

- Prepacked Floor Screed/Water Proofing Screed
- Prepacked Plaster
- Prepacked Skim Coat
- Acrylic Polymer Cementitious Coating
- Self-Levelling Screed
- Preformed Waterproofing Membrane
- Liquid Applied Waterproofing Coating
- Insulation Form
- Sealant
- Tiles
- Tile Adhesives/Tile Grout
- Brick/Concrete Paving Blocks
- Concrete Paving Flags/Kerbs/Channels/Slabs
- Paint/Coating
- Cement/Flay Ash/Silica Fume/Ground Granulated Blast Furnace Slag
- Rock and Natural Stones
- Soil-Cement Mixture
- Masonry/Autoclaved Aerated Concrete

#### **Repair Materials**

- Repair Mortar
- Non-Shrink Grout
- Polymer Modified Cement Mortar
- Bonding Agent
- Epoxy Mortar
- Epoxy Resin for Injection
- Waterproofing Membrane and Waterproofing Materials
- Geotechnical Grouting
- Grout for Prestressing Tendons
- Rubber Waterstop

To maintain high standards of building quality, the materials used in construction must meet strict regulations and performance standards. This requires rigorous screening and testing to ensure compliance with statutory requirements.

At R.A.K. Materials Consultants, we provide comprehensive testing services based on product evaluation requirements aligned with industry standards and technical specifications. This is crucial for programs like the Housing & Development Board (HDB)'s Materials List, which selects and evaluates quality products for HDB construction projects.

# **WATERPROOFING TEST**



Effective waterproofing is essential for safeguarding structures from moisture damage and ensuring their longevity. At R.A.K. Materials Consultants, we offer an extensive range of waterproofing testing services to evaluate the performance of your waterproofing materials, ensuring they meet industry standards and are durable under varying conditions.

We test a wide variety of waterproofing products, including:

- Waterproofing Admixture for Concrete
- Preformed Membrane
- Liquid-Applied Waterproofing Coating
- Cementitious Waterproofing
- Polyurethane Liquid Membrane
- EPDM Rubber

- Bituminous Coating Membrane
- PVC Waterproofing Membrane
- Thermoplastic Waterproofing Membrane
- Sealant
  - Crystalline Waterproofing Coating

Our testing capabilities cover all critical aspects, such as:

- Tensile Pull-Off Strength
- Crack Bridging
- Shore Hardness
- Water Penetration
- Water Vapor Transmission
- Accelerated Weathering
- Dimensional Stability
- Tensile Shear at Joint
- Puncture Resistance
- Impact Resistance
- Peel Adhesion to Concrete

- Resistance to Hydrostatic Head
- Resistance to Leakage at Joint
- Resistance to Static Loading
- Tensile Strength & Elongation at Break
- Chemical Resistance
- Lateral Water Migration
- Electrical Resistivity
- Tear Resistance
- Peel Resistance at Joint
- Heat Aging

# **CHEMICAL & BIOLOGICAL TESTING**



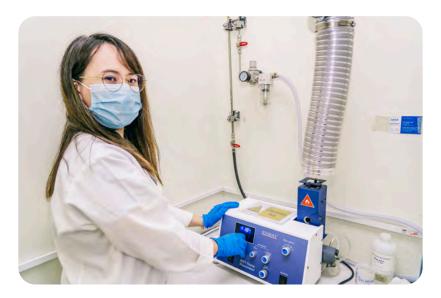












We push the boundaries of materials testing with our state-of-the-art analytical instruments, designed to address a wide range of needs—from material identification and characterization to quality control monitoring.

Our advanced tools and expertise enable us to provide in-depth analysis in areas such as surface analysis, composition and contamination measurement, trace elemental analysis, and microscopy.

We have made significant investments in instruments for chemical analysis and materials testing, ensuring our clients benefit from comprehensive testing services. Our capabilities include:

- Spectroscopy
- Mass Spectrometry
- Thermal Analysis
- Chromatography

Whether you require precise measurements for trace elements or detailed insights into the composition and behaviour of materials, our skilled engineers and cutting-edge equipment will help you gain a deeper understanding of your materials, ensuring optimal performance in every project.

# **ENVIRONMENTAL TESTING**

We understand that environmental testing requires precision and reliability.

Our extensive range of environmental testing services is as diverse as our clients' needs. Using state-of-the-art equipment in accredited laboratories, we provide reassurance and accuracy, no matter how complex the task.

Our expertise spans the analysis of soil, sediment, sludge, water, and leachates. We offer testing across various levels, including routine, trace, and ultra-trace analysis for:

- Organics (Volatile and Semi-Volatile Compounds)
- Metals
- Nutrients
- Inorganic nonmetallics
- Microbiological Testing

We base our methods on internationally recognized procedures, including standards from the United States
Environmental Protection Agency (USEPA), the American Public Health Association (APHA), and Singapore standards.



# **MECHANICAL ENGINEERING TESTING**

We are equipped with state-of-the-art testing facilities to help you verify the mechanical properties of metals and polymers.

Our highly experienced technicians, combined with our fast turnaround times, ensure a seamless and efficient testing experience, whether your project is large or small.

We offer both standard method testing and custom programs to meet the specific needs of your project, delivering accurate and reliable results every time. Our mechanical testing services include:

- Tensile Test
- Bend & Re-bend Test
- Weld Shear Test
- Tension Load Test
- Charpy Impact Test
- For Products
- Metals & Metals Product
- Reinforcement Steel Bar
- Welded Steel Fabric
- Prestressing Steel
- Mechanical Couplers
- Structural Steel
- Bolts & Nuts

- Brinell Hardness Test
- Rockwell Hardness Test
- Vickers Hardness Test
- Chemical Composition Analysis











# PRODUCT CERTIFICATION









In today's rapidly evolving landscape, staying ahead of new technologies and an increasing number of certification regulations can be a challenge for manufacturers. At ASIA INSPECTION AND CERTIFICATION PTE LTD, a proud member of our group, our team of certification experts is here to provide the testing and certification assistance you need to bring your products to market with confidence.

We are one of the leading certification bodies accredited by the Singapore Accreditation Council (SAC), we specialize in the certification of Ready-Mixed Concrete (RMC) supplies. With over sixty certified plants in Singapore and Malaysia, we ensure your products meet the highest standards, facilitating smooth access to the marketplace.

Since the adoption of Eurocode 3/EN 1993 for Structural Steel Design by the Singapore Building and Construction Authority (BCA), the industry has had to align with a rigorous control framework. Additionally, AIC has been actively engaged in the new accreditation program launched in December 2022 for the certification of Specialist Builders (Precast Concrete Works), jointly led by BCA and SAC. This program guarantees that precast factories or yards comply with relevant standards during the production of precast concrete products or structures, instilling confidence in purchasers.

# SITE SERVICES













As architects and engineers push the boundaries of construction, building materials and assembly performance testing are essential to ensuring that buildings function as intended and meet Building Regulations. At R.A.K. Materials Consultants, we offer a wide range of site testing services to ensure full compliance and safety across construction projects.

Our on-site testing services include:

- Concrete Testing
- Non-Destructive Testing (NDT)
- In-situ Soil Testing

For critical structural elements, load testing of fixings, anchors, ties, studs, rebar, and other structural components is crucial to prove the safe working load. We perform pull-out testing to evaluate the strength of fixings between concrete and other securing materials, ensuring the highest safety standards. Though the materials may vary, the testing principles remain consistent across all types of fixings.

We offer a comprehensive range of lift beam fixing and pull testing services, with on-site testing capabilities up to a proof load of 50 tons and displacement measurement accuracy up to 0.01mm, following the strict guidelines of BS 5080-1. R.A.K. can perform lift beam and pull-out testing for a variety of scenarios, ensuring your project meets structural integrity requirements.

# **SITE SERVICES**



### Concrete Non-Destructive Testing (NDT)

- Carbonation
- Concrete Resistivity Test
- Corrosion Potentials (Half Cell Potentials Test)
- Covermeter Survey (Rebar Scanning)
- Electromagnetic Cover Measurement
- Ground Penetrating Radar Test (GPR)
- Impact Echo Test
- Penetration Resistance (Windsor Probe Test)
- Portable Hardness Test and Steel UTG
- Rate of Corrosion

#### **In-Situ Testing**

- In-place Density & Water Content Test by Nuclear Method (NDG)
- Plate Bearing Test
- Sand Replacement Test
- Dry Film Thickness (Paint Testing)
- Pile Integrity Testing (PIT)
- Pull off Test of Wall Tile
- Structural Load Testing
- Trial Pit (Foundation Investigation)

# Instrumentation Monitoring

- Concrete Temperature Monitoring
- Crack Movement Monitoring

#### **Site Inspection**

- Bridge Bearing Inspection
- Façade Inspection
- Periodic Structural Inspection (PSI)
- Pre-con and Post-con Inspection
- Structural Inspection
- Thermographic Inspection

#### **Consultancy**

- Inspection and Consultation at Mining Site
- Investigation of Water Seepage and Moisture Detection
- Investigation for Concrete Failure
- Petrographic Examination in Concrete under fire damage

# **FAÇADE INSPECTION**



### Your Partner for Safe and Efficient Facade Inspection

The Periodic Façade Inspection (PFI) regime was introduced in 2020 by BCA and implemented on 1 Jan 2022. The regime aims to help building owners detect and address any facade deterioration in a timely manner thus ensuring public safety.

Buildings that are more than 20 years of age are to be inspected every 7 years with the exception of:

- Detached houses, semi-detached houses, terraced or linked houses which are used solely as places of residence
- Temporary buildings as defined under the Building Control (Temporary Buildings) Regulations 2018
- Buildings where the highest point (including its roof, if applicable) is 13 metres or lower when measured from the ground.

R.A.K is proud to be qualified as façade inspectors and possesses all the necessary licenses to pilot drones in Singapore. With our vast experience in conducting numerous facade inspections for both commercial and residential buildings, we are committed to delivering exceptional results.

R.A.K Materials Consultants Pte Ltd, has been at the forefront of utilizing cutting-edge technology to enhance the efficiency and safety of facade inspections in the Built Environment sector. By leveraging unmanned aircraft systems (UAS) or drones, R.A.K. has revolutionized the way façade inspections are conducted. Discover the future of facade inspections with R.A.K.—where innovation and safety come together.



# THERMOGRAPHIC SCANNING



At R.A.K. Materials Consultants Pte. Ltd., we harness the cutting-edge power of infrared thermographic scanning—a non-contact method that identifies temperature variations in walls, beams, and ceilings. This innovative approach allows us to pinpoint potential issues without any physical contact, safeguarding the integrity of your property.

Normal temperatures are displayed in grayscale, while extreme variations burst into vivid colors: green for room temperature, red and white for hot spots, and purple and dark blue for cooler areas. Our advanced thermographic camera captures these temperature differences and transforms them into detailed images, offering a comprehensive view of your structure's thermal condition.

Why Choose Thermographic Scanning?

- Early Issue Detection: Identify insulation defects, moisture intrusion, and electrical hotspots before they escalate, ensuring timely action and prevention.
- Non-Destructive Testing: Assess your property without causing damage, preserving the integrity and value of your materials.
- Comprehensive Thermal Analysis: Gain a complete view of your building's thermal profile, revealing both localized and systemic energy efficiency issues.
- Cost Savings: Address potential problems early to avoid costly repairs and extend the lifespan of your property.
- Enhanced Safety and Compliance: Detect overheating components to prevent fire hazards and ensure adherence to safety and building regulations.

# INSPECTION AND INVESTIGATION









At R.A.K. Materials Consultants, we provide specialized consultancy services to ensure the quality and performance of the materials used in your construction projects. Our expert team offers two critical services:

#### **Quarry Investigation for Concrete Aggregate**

The quality of aggregates is fundamental to the performance of concrete. At R.A.K., we conduct comprehensive quarry investigations to assess the suitability of aggregates for use in concrete production. Our services include:

- Material sampling and geological assessment of the quarry site
- Testing for physical and chemical properties of aggregates
- Evaluation of aggregate quality for compliance with relevant standards (SS, ASTM, BS, EN)
- Recommendations for aggregate extraction and processing methods to ensure optimal performance in concrete mixes

We deliver precise results that help ensure the long-term durability and reliability of concrete used in your projects.

#### **Failure Analysis on Concrete Structures**

When concrete structures show signs of distress or failure, prompt and accurate diagnosis is essential. R.A.K. offers failure analysis services to investigate the root cause of concrete failure and provide actionable solutions. Our services include:

- · On-site inspection and evaluation of damaged or deteriorated concrete structures
- Non-destructive Testing (NDT) and core sampling for laboratory analysis
- Analysis of material properties, workmanship, and environmental factors contributing to failure
- Expert recommendations for remediation, repair strategies, and prevention of future failures.

Whether addressing cracks, structural degradation, or performance issues, our team provides comprehensive failure assessments that ensure safety and compliance with structural standards.

# **CONSULTANCY SERVICES**



#### **QUALITY MANAGEMENT SYSTEM**

Implementing a robust quality assurance and management system is essential for any organization seeking to build customer trust, enhance employee satisfaction, and drive profitability. By adopting best practices in quality management, your organization can reduce costs, improve output, and overcome daily challenges with greater ease. Moreover, an effective system provides a foundation for continuous improvement, leading to higher customer satisfaction and long-term success.

At R.A.K. Materials Consultants, we are committed to guiding you through the entire process of selecting the right standards, rules, and regulations tailored to your products and services. Our comprehensive offerings include:

- Identifying relevant standards and specifications to ensure regulatory and quality compliance.
- Comprehensive testing services or assistance in finding suitable laboratories as needed.
- Conducting professional examination and validation of your compliance documentation to meet required specifications.

Our expertise ensures that you not only achieve compliance but also integrate best practices that enhance the quality and reliability of your products and services.



#### **ISO/IEC 17025 CONSULTANCY**

Achieving ISO/IEC 17025 accreditation is a critical step for testing and calibration laboratories aiming to demonstrate their competence and reliability. This internationally recognized standard focuses on two key areas:

- Management Requirements, which ensure the effective operation of the laboratory's quality management system, similar to the ISO 9001 standard.
- Technical Requirements, which address the competence of staff, the accuracy of testing methods, the quality of equipment, and the precision in reporting test and calibration results.

At R.A.K. Materials Consultants, our extensive experience in ISO/IEC 17025 accreditation under SAC-SINGLAS uniquely positions us to guide you through the entire accreditation process.

We provide expert assistance to ensure your laboratory meets the necessary management and technical requirements, empowering you to confidently pursue and achieve accreditation.

Let us partner with you to elevate your quality management systems for lasting success.

# APPLIED R&D ON ADVANCED AND GREEN MATERIALS



At R.A.K. Materials Consultants, we provide a full suite of services for the development of advanced materials and new applications in industrial R&D. With our highly experienced team and state-of-the-art facilities, we support every stage of development—from fundamental research to prototyping and pilot production.

As global environmental awareness rises, businesses are increasingly turning to green products to enhance profitability and improve brand recognition. The Singapore Green Labelling Scheme (SGLS), launched by the Ministry of the Environment in 1992, enables businesses to certify products that meet ecofriendly standards. Attaining the Green Label allows businesses to promote their environmental responsibility and gain a competitive edge in the marketplace.

R.A.K.'s consultancy and testing services for Green Label certification include:

- Product Category Identification
- Information Compilation
- Test Requirements
- Estimated Cost and Schedule
- Coordination for Samples Testing
- Test Reports and Product Information Compilation
- Application Submission
- Follow-up with Application Results





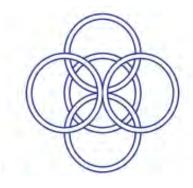






# **ASIA LABORATORIES GROUP**





R.A.K. Materials Consultants Pte. Ltd.

R.A.K. Materials Consultants Sdn. Bhd.

# **ACCREDITATIONS**









#### R.A.K. MATERIALS CONSULTANTS PTE. LTD.

Main Office & Chemical Lab: Block 2019, Bukit Btok Street 23 #03-268 Bukit Batok Industrial Estate Park A, Singapore 659524

TEL: +65 6561 5366 / +65 9788 6514

Civil Lab:

Block 2032, Bukit Batok Street 23 #01-298 Bukit Batok Industrial Estate Park A, Singapore 659537 TEL: +65 6561 0219

Branch Lab: 25 First Lok Yang Road, Singapore 629734 email: enquiry@rakmat.com.sg

ASIA INSPECTION AND CERTIFICATION PTE. LTD.

Block 2019, Bukit Btok Street 23 #03-268 Bukit Batok Industrial Estate Park A, Singapore 659524

#### R.A.K. MATERIALS CONSULTANTS SDN. BHD.

PLO 68A, Jalan Teknologi 2/5, Kawasan Perindustrian IKS, 86200 Simpang Renggam, Johor Malaysia email: malaysia@rakmat.com.sg

Branch Lab:

150, Jalan Sac 5, Taman Perindustrian I-Park, 81400 Senai, Johor. 81400 Malaysia TEL: 017-2594074

#### AMT LABORATORIES SDN. BHD.

Ground Floor, PT 487, Bgn Sentosa Jaya, Jalan Sri Cemerlang Seksyen 27, 15300 Kota Bharu, Kelantan, Malaysia

TEL: +609 740 6372 HP: +601 2345 1142





