


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>Accredited to ISO/IEC 17025:2005</p>	<h3>Tun Abdul Razak Research Centre</h3> <p>Issue No: 028 Issue date: 05 March 2020</p>	
	<p>Brickendonbury Hertford Hertfordshire SG13 8NL</p>	<p>Contact: Ms J Patel Tel: +44 (0)1992 584966 Fax: +44 (0)1992 554837 E-Mail: jpatel@tarrc.co.uk Websites: www.tarrc.co.uk www.rubberconsultants.com</p>
<p>Testing performed at the above address only</p>		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
<p>RUBBERS/ELASTOMERS, RUBBER/ELASTOMER PRODUCTS AND MATERIALS IN CONTACT WITH RUBBER</p>	<p><u>Chemical Tests</u></p>	
	<p>Aromaticity of oils extracted from rubbers/rubber compounds</p>	<p>Documented In-House Method 093a using NMR according to ISO 21461:2012</p>
	<p>Ash content</p>	<p>Documented In-House Method 001 based on ISO 247:1990</p>
	<p>Nitrosamine testing of rubber or airborne samples</p>	<p>Documented In-House Method 051 using Gas Chromatography with Nitrogen Chemiluminescence Detection, covering BS EN 12868:1999 and BS ISO 29941:2010</p>
	<p>Acrylonitrile Monomer (ACN or RAM testing)</p>	<p>Documented In-House Method 065a using Gas Chromatography (GC-NPD) based on ASTM D4322-92 (2001)</p>



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RUBBERS/ELASTOMERS, RUBBER/ELASTOMER PRODUCTS AND MATERIALS IN CONTACT WITH RUBBER (cont'd)	<u>Chemical Tests</u> (cont'd) Qualitative and Quantitative Analysis for rubber identification and content Elemental Analysis: Aluminium Antimony Arsenic Barium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Selenium Silicon Sulphur Tin Titanium Vanadium Zinc	Documented In-House Methods using: - Thermogravimetric Analysis (TGA): method 011 - Differential Scanning Calorimetry (DSC): method 012a - FT-IR Spectroscopy: Method 031a - Pyrolysis with Infra-Red (PIR) including surface ATR Spectroscopy: method 031b - TG-IR interface Method 031c (IR interfaced to TGA) Inductively Coupled plasma with Atomic Emission Spectroscopy (ICP-AES): method 081



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RUBBERS, POLYMERS, PLASTICS, ELASTOMERS	<u>Chemical Tests</u> Identification of elements for composition analysis, reverse engineering filler type, or contamination	Documented In-House Methods using: - Scanning Electron Microscopy (SEM) with Energy Dispersive X-ray Spectrometry (EDS), Line-scans and X-ray Mapping Spectrometry: methods 072b and 072d
RUBBER, POLYMER, PLASTIC, ELASTOMER PRODUCTS		
MATERIALS IN CONTACT WITH RUBBERS, POLYMERS, PLASTICS, ELASTOMERS	<u>Chemical and Physical Test</u> Qualitative scanning electron microscopy (SEM) using magnifications in the range 1.5x to 300,000x Quantitative measurement of length using magnifications in the range 50x to 30,000 Sample preparation for scanning electron microscopy (SEM) Sample preparation for transmission electron microscopy (TEM), atomic force microscopy (AFM), scanning transmission electron microscopy (STEM), and light microscopy Qualitative transmission electron microscopy (TEM) of thin sections and particles using magnifications in the range 3,000x to 750,000x Quantitative measurement of length using magnifications in the range 3,000x to 430,000x	Documented In-House Methods using: - Scanning Electron Microscopy (SEM): method 072c - Sample preparation for scanning electron microscopy (SEM); method 072a - Ultramicrotomy and Cryomicrotomy using glass and diamond knives: methods 070a and 070c - Staining with Osmium Tetroxide; method 070g - Transmission Electron Microscopy (TEM): method 073 - Production of TEM images for Latex Particle Sizing: method 074



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<p>RUBBERS, POLYMERS, PLASTICS, ELASTOMERS</p> <p>RUBBER, POLYMER, PLASTIC, ELASTOMER PRODUCTS</p> <p>MATERIALS IN CONTACT WITH RUBBERS, POLYMERS, PLASTICS, ELASTOMERS (cont'd)</p> <p>TYRES - COMMERCIAL AND PASSENGER VEHICLES</p>	<p><u>Physical Tests</u></p> <p>Optical Microscopy / Qualitative Analysis</p> <p>Quantitative measurement of length using magnifications in the range: 100x to 625x for phase contrast and 20x to 625x for transmitted, incident, bright field and dark field imaging (using compound optical microscope)</p> <p>4x to 84x using stereo optical microscope</p> <p><u>Performance Test</u></p> <p>Endurance 200 - 5000 kgf</p>	<p>Documented In-House Methods using:</p> <ul style="list-style-type: none"> - Compound optical microscope including phase contrast, transmitted and incident light, bright field and dark field imaging: method 071a - Stereo optical microscope with digital camera: method 071c - Zoom lens with digital camera for low magnification imaging: method 071b <p>Documented In-House Method based on, and meeting the requirements of, ECE 30, 54, 108 and 109 (TTL 002)</p>



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RUBBERS AND ELASTOMERS	<u>Physical Tests</u>	
	Tensile Properties including determination of tensile strength, elongation at break and modulus	BS ISO 37:2017 (PET Test Method 1)
	Hardness test : Normal (N), Micro test (M) and Micro test on a curved surface (CM)	BS ISO 48-2:2018 (PET Test Method 2)
	Compression Set	BS ISO 815-1:2019 (PET Test Method 3)
	Trouser Tear	BS ISO 34-1:2015 Method A (PET Test Method 4)
	Angle Tear	BS ISO 34-1:2015 Method B (PET Test Method 5)
	Crescent Tear	BS ISO 34-1:2015 Method C (PET Test Method 6)
	Ozone Resistance	BS ISO 1431-1:2012 (Static only) (PET Test Method 7)
Heat Resistance/Accelerated Air Ageing	BS ISO 188:2011 (PET Test Method 8)	
END		