Schedule of Accreditation

issued by

United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

1677

Accredited to ISO/IEC 17025:2005

Tun Abdul Razak Research Centre

Issue No: 020 **Issue date:** 03 March 2014

Brickendonbury
Hertford
Hertfordshire
SG13 8NL

Contact: Mr C Stephenson
Tel: +44 (0)1992 584966
Fax: +44 (0)1992 554837
E-Mail: cstephenson@tarrc.co.uk
Website: www.tarrc.co.uk

Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
RUBBERS/ELASTOMERS, RUBBER/ELASTOMER PRODUCTS AND MATERIALS IN CONTACT WITH RUBBER	<u>Chemical Tests</u>	
	Aromaticity of oils extracted from rubbers/rubber compounds	Documented In-House Method 093a using NMR according to ISO 21461:2006
	Ash content	Documented In-House Method 001 based on ISO 247:1990
	Nitrosamine testing of rubber or airborne samples	Documented In-House Method 051 using Gas Chromatography with Thermal Energy Analyser, covering BS EN 12868:1999
	Acrylonitrile Monomer (ACN or RAM testing)	Documented In-House Method 065a using Gas Chromatography (GC-NPD) based on ASTM D4322-92 (2001)
	Accelerators and accelerator residues in rubber, specifically: - dithiocarbamates - thiurams - mercaptobenzothiazole (MBT) - guanidine - dibenzothiazyl disulphide (MBTS) - thioureas	Documented In-House Method 063 using High Performance Liquid Chromatography (HPLC): method 063a method 063b method 063c method 063d method 063e method 063f

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
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	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) - Thin Layer Chromatography (TLC): method 061 - High Performance Liquid Chromatography (HPLC): method 063
	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	Inductively Coupled plasma with Atomic Emission Spectroscopy (ICP-AES): method 081

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
RUBBERS/ELASTOMERS, RUBBER/ELASTOMER PRODUCTS AND MATERIALS IN CONTACT WITH RUBBER (cont'd)	<u>Physical Tests</u>	
	Qualitative Analysis, Optical Imaging	Documented In-House Methods using: - Sample Preparation: Microtomy, and Cryomicrotomy using glass knives; methods 070a and 070c - Compound optical microscope including phase contrast, transmitted and incident light, bright field and dark field imaging; method 071a - Zoom lens with digital camera for low magnification imaging; method 071b - Stereo optical microscope with digital camera; method 071c
	Quantitative measurement of length using magnifications in the range: 100 to 625 for phase contrast and 20 to 625 for transmitted, incident, bright field and dark field imaging (using compound optical microscope) 4 to 84 using stereo optical microscope	
	Qualitative electron-optical imaging	Documented In-House Methods using: - Sample preparation; method 072a - Scanning Electron Microscopy; method 072c - Scanning Transmission Electron Microscopy; method 075
	Quantitative measurement of length using magnifications in the range 100 to 10k	
	<u>Chemical and Physical Test</u>	
	Elemental analysis for filler type or contamination in rubbers	Documented In-House Methods using: - Sample preparation; method 072a - Scanning Electron Microscopy with Energy Dispersive X-ray and X-ray Mapping Spectrometry; methods 072b and 072d

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
RUBBERS/ELASTOMERS, RUBBER/ELASTOMER PRODUCTS AND MATERIALS IN CONTACT WITH RUBBER (cont'd)	<u>Chemical and Physical Tests</u> Qualitative electron imaging of thin sections and particles using magnifications in the range 35 to 750 k Quantitative measurement of length using magnifications in the range 3.8 k to 100 k	Documented In-House Methods using: - Sample Preparation: Ultramicrotomy and Cryomicrotomy using glass and diamond knives; methods 070a and 070c - Sample Preparation: Staining with Osmium Tetroxide; method 070g - Sample Preparation: Preparation of shadowed carbon replicas; method 070k - Transmission Electron microscopy; method 073 - Latex Particle Sizing; method 074
Medical gloves and natural rubber latex films	Aqueous extractable proteins	Documented In-house method BT 0002a using the modified Lowry Assay based on ASTM D5712-10 Documented In-house method BT 0002e using the modified Lowry Assay based on EN 455-3:2006 (spectrophotometry)
TYRES - COMMERCIAL AND PASSENGER VEHICLES	<u>Performance Test</u> Endurance 200 - 5000 kgf	Documented In-House Method based on, and meeting the requirements of, ECE 30, 54, 108 and 109 using 1.707 meter diameter test drums (TTL 002)
END		