Specification of chemicals reagents and other required Inputs for The Provision of Testing Services on Polychlorinated Biphenyls (PCBs) from power Transformer and Capacitor

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Category of specification	Requirement
Item No. 01.01	**Individual and mix PCB Congeners 18, 28, 30, 31, 44, 52, 101, 118, 138, 149, 153, 170, 180, 194, and 209.**
1.Description/ Scope	For the analysis of PCB from transformer oil
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2,EPA 600
3. Unit	Milliliter
4. Quantity	5 Milliliter for each individual and mix congeners in 1Milliliter ampule
5. Technical Specification	➢ CRM, Traceable to NIST, PTB, BAM or equivalent (i.e. Accredited to ISO 17034) ➢ Concentration ≥ 99% ➢ GC grade ➢ Expiry date minimum of 5 years
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture ➢ Space on the label for date received and date open

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Category of specification	Requirement
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.02	**Individual and mix PCB Aroclors 1242, 1254 and 1260**
1.Description/ Scope	For the analysis of PCB from transformer oil
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2,EPA 600
3. Unit	Milliliter
4. Quantity	5 ampules for each individual and mix congeners in 1Milliliter ampule
5. Technical Specification	➢ CRM, Traceable to NIST, PTB, BAM or equivalent (i.e. Accredited to ISO 17034) ➢ Concentration ≥ 99% ➢ GC grade ➢ Expiry date minimum of 5 years
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data ➢ Certificate of analysis ➢ Date of manufacture ➢ Space on the label for date received and date open
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.03	**Solid phase extraction (SPE)**
1.Description/ Scope	Silica-bonded sulfoxide (-SO), Si OH weakly acidic silica , Silica gel and benzene sulfonic acid phase column for the extraction of polychlorinated biphenyls (PCBs) from transformer, waste and mineral oil.
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	1000 for each type
5. Technical Specification	➢ PCBs at quantitation limits of 0.5 ppm concentration ➢ 3g/6Milliliter for Supelclean Sulfoxide and SiOH ➢ 0.5g/3Milliliter for Silica gel and benzene sulfonic acid
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis

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Category of specification	Requirement
	➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.04	**Solid phase extraction (SPE) adapter**
1.Description/ Scope	Used to stack one SPE tube on top of another to provide different selectivity.
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	24
5. Technical Specification	➢ SPE Tube *Adapter* PTFE (with female luer port) ➢ For 1, 3 and 6 Milliliter
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.05	**Dimethyl sulfoxide (DMSO)**
1.Description/ Scope	For sample preparation
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Liter
4. Quantity	5
5. Technical Specification	➢ Concentration ≥ 99% ➢ GC grade ➢ Expiry date minimum of 5 years
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement

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Category of specification	Requirement
Item No. 01.06	**Isotopically labeled internal standard Hexachlorobenzene**
1.Description/ Scope	Internal standard
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Milligram
4. Quantity	20
5. Technical Specification	➢ CRM, Traceable to NIST, PTB, BAM or equivalent (i.e. Accredited to ISO 17034) ➢ Concentration ≥ 99% ➢ GC grade ➢ Expiry date minimum of 5 years
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.06	**PCB free transformer oil**
1.Description/ Scope	Transformer oil free from PCB
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Milliliter
4. Quantity	1000
5. Technical Specification	➢ Analytical grade ➢ Expiry date minimum of 5 years ➢ Should be chlorine free
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.07	**Isooctane**

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Category of specification	Requirement
1.Description/ Scope	GC grade isooctane free from chlorinated compound interference under analysis conditions for For Sample preparation
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Liter
4. Quantity	10
5. Technical Specification	➢ Concentration ≥ 99% ➢ GC grade ➢ Expiry date minimum of 5 years ➢ Should be chlorine free
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.08	**Deactivated GC glass liner with silicon ring and glass wool**
1.Description/ Scope	GC consumable for Split / splitless injector
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	30
5. Technical Specification	➢ Inlet liners facilitate sample vaporization in the GC inlet ➢ Compatible for Agilent GC
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.09	**GC Capillary DB-1701**
1.Description/ Scope	For the separation of PCB **DB-1701** is a low/mid-polarity (14% cyanopropyl-phenyl)-methylpolysiloxane column. It is ideal for the analysis of pesticides, herbicides, trimethylsilyl (TMS) derivatives of sugars and related substances, and aroclors.

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Category of specification	Requirement
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	2
5. Technical Specification	➢ (14%-Cyanopropyl-phenyl)-methylpolysiloxane ➢ Solvent rinsable with low/mid polarity ➢ Bonded and cross-linked ➢ 30m, 0.25mm, 0.25µm
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.10	**Silicon ring for liner**
1.Description/ Scope	Inlet Liner O-Ring and Inlet Seals for Agilent (5890, 6890, and 7890), Inlet Liner O-Rings, SPME Accessories, Sample Preparation & Purification, Solid Phase Microextraction (SPME), Therm-O-Ring Seal
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pack (each pack contains 10 O-rings)
4. Quantity	3
5. Technical Specification	➢ ID:0.250in ➢ 350 °C max. temp. ➢ Color: brown O-ring ➢ Compatibility: configured for capillary inlet liner ➢ Fits 6.3 mm O.D. (split) and 6.5 mm O.D. (splitless) capillary liners, and any 1/4in. O.D. capillary liner that uses an O-ring. Superior replacement for Viton O-rings.
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Certificate of analysis
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.11	**GC Capillary Column Rxi-XLB**

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Category of specification	Requirement
1.Description/ Scope	**GC Capillary Column Rxi-XLB:** low polarity proprietary phase ➢ Ideal for many GC-MS applications, including pesticides, PCB congeners (e.g., Aroclor mixes), PAHs.
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	1
5. Technical Specification	➢ Unique selectivity. ➢ General-purpose columns exhibiting extremely low bleed. ➢ Temperature range: 30 °C to 360 ° ➢ Length:30m, ➢ Film Thickness: 0.25mm ➢ ID, 0.25µm
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.12	**HP-5ms Column**
1.Description/ Scope	➢ HP-5ms is a (5%-phenyl)-methylpolysiloxane phase with very low bleed characteristics that is ideal for GC/MS. The column is bonded, crosslinked, and solvent rinsable, and has excellent inertness for active compounds, including acidic and basic compounds, with improved signal-to-noise ratio for better sensitivity and mass spectral integrity.
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	1
5. Technical Specification	➢ Nonpolar with very low bleed characteristics, ideal for GC/MS ➢ Excellent inertness for active compounds, including acidic and basic compounds ➢ Improved signal-to-noise ratio for better sensitivity and mass

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Category of specification	Requirement
	spectral integrity ➢ Bonded, cross-linked, and solvent rinseable ➢ Equivalent to USP phase G27 ➢ Tested with the tightest industry QC specifications for column bleed, sensitivity, and efficiency ➢ Temperature range: 30 °C to 360 ° ➢ Length:30m, ➢ Film Thickness: 0.25mm ➢ ID, 0.25µm
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.13	**Silicon ring for liner**
1.Description/ Scope	Inlet Liner O-Ring and Inlet Seals for Agilent (5890, 6890, and 7890), Inlet Liner O-Rings, SPME Accessories, Sample Preparation & Purification, Solid Phase Microextraction (SPME), Therm-O-Ring Seal
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pack (each pack contains 10 O-rings)
4. Quantity	3
5. Technical Specification	➢ ID:0.250in ➢ 350 °C max. temp. ➢ Color: brown O-ring ➢ Compatibility: configured for capillary inlet liner ➢ Fits 6.3 mm O.D. (split) and 6.5 mm O.D. (splitless) capillary liners, and any 1/4in. O.D. capillary liner that uses an O-ring. Superior replacement for Viton O-rings.
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Certificate of analysis
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.14	**3 Milliliter silica gel column**

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Category of specification	Requirement
1.Description/ Scope	For sample preparation of PCB from transformer oil and capacitors
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs
4. Quantity	1000
5. Technical Specification	➢ Volume: 3Milliliter ➢ Particle size 40 µm ➢ adsorbent mass 500 mg
6. Packaging	As per the standard
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.15	**Septum (11 mm diameter)**
1.Description/ Scope	The septum eliminate sticking in the GC inlet and to guide the syringe needle to the same point with every injection.
2.Test Method and Verification Standards	
3. Unit	Pack
4. Quantity	1 (100pcs/pack)
5. Technical Specification	➢ Inlet septa, Advanced Green, non-stick, ➢ Diameter: 11 mm, for 5880, 5890, 4890, 6850, 6890, 7890 GCs
6. Packaging	100pcs/pack
7. Documentation Requirement:	➢ Certificate of analysis
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.16	**Supelclean Sulfoxide SPE, 3 g/6 Milliliter**
1.Description/ Scope	SPE consists of a silica-bonded sulfoxide (-SO) phase used for the extraction of polychlorinated biphenyls (PCBs) from transformer

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Category of specification	Requirement
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs (each pack contains 30 pcs)
4. Quantity	1500
5. Technical Specification	➢ Material type: PE frit ➢ Matrix active group: sulfoxide phase ➢ Volume: 6Milliliter ➢ Particle size 40 µm ➢ Bed wt:3g ➢ adsorbent mass 500 mg ➢ separation technique normal phase
6. Packaging	As per the standard
7. Documentation Requirement:	Material safety data sheet Certificate of analysis Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.17	**SPE benzenesulfonic acid cation exchanger based on silica (SCX)**
1.Description/ Scope	SCX solid-phase extraction (SPE) strong cation exchange (SCX) cartridge is a silica-based benzenesulfonic acid-based filler. Its negatively charged sulfonic acid group has a strong cation exchange capacity, and the benzene ring has certain hydrophobic retention.
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pcs (each pack contains 30 pcs)
4. Quantity	1500
5. Technical Specification	➢ Material type: PE frit ➢ Matrix active group: sulfoxide phase ➢ Volume: 6Milliliter ➢ Particle size: 45 µm ➢ specific surface 500 m2/g, pH stability 2–8 ➢ strongly acidic cation exchanger (capacity ~ 0.5 meq/g) ➢ separation technique cation exchange
6. Packaging	As per the standard

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Category of specification	Requirement
7. Documentation Requirement:	➢ Material safety data sheet ➢ Certificate of analysis ➢ Date of manufacture
8. Delivery Schedule	Not more than three to four months from the time of the order placement
Item No. 01.18	**Standard auto sampler vials with cap and septa**
1.Description/ Scope	GC grade 2ml glass chromatography vial
2.Test Method and Verification Standards	ASTM D 4059-00 –2018, EN 12766-1and 2, EPA 8290
3. Unit	Pack (100 pcs)
4. Quantity	40 pack
5. Technical Specification	➢ Standard auto sampler vials with cap and septa, 12 x 32 mm, screw thread volume 2 mL, pre-assembled convenience pack, clear glass vial, PTFE/silicone septa, graduation lines ➢ Clear, type 1 class A borosilicate glass
6. Packaging	➢ As per the standard
7. Documentation Requirement:	➢ CE, ISO
8. Delivery Schedule	Not more than three to four months from the time of the order placement