NSC – TISI – TIS 17025
TESTING 0298
TUV Rheinland Thailand Ltd.

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Report No.:	**242138437-07**	Page 1 of 8
Client:	**IRPC PUBLIC COMPANY LIMITED**	
Contact Information:	555/2 Energy Complex, Building B, 6th Floor, Vibhavadi Rangsit Rd., Chatuchak, Bangkok 10900 Thailand	
Identification/	PP Homo Polymer	
Model No(s):	1100NK	
Sample Receiving date:	2023-08-11	
Testing Period:	2023-08-11 to 2023-08-21	
Delivery condition:	*Apparent good, Samples tested as received*	

Test Specification: ***Test result:***

Test parameter and specification was selected by client;

1. RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU and its amendment Directive (EU) 2015/863 of 31 March 2015 — PASS

Other information:

Supplier: IRPC

Country of Origin: Thailand

For and on behalf of

TÜV Rheinland Thailand Ltd.

TÜV RHEINLAND THAILAND LTD. TÜV

2023-08-21 — Phamorntip Kludsombut / Project Manager

Date — ***Name/Position***

Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed.
This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts.
This testreport does not entitle to carry any safety mark on this or similar products.
The Decision Rule is apply "Zero Guard Band" in accordance to ILAC-G8:09/2019 and IEC Guide 115:2021, describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report. Unless otherwise be required by the standard or requested by the customer.

Test Report No.: 242138437-07

Material list:

Item: PP Homo Polymer
1100NK

Material No.	Material	Color	Location
M001	Plastic	Natural	Refer to photo

Test Report No.: 242138437-07

1. Heavy metal content (Pb, Cd, Hg, Cr(VI))

Test method: Total Lead, Cadmium - Ref. to IEC 62321-5 Edition 1.0: 2013-06, determine by ICP-OES.
Total Mercury - Ref. to IEC 62321-4: 2013 + AMD 1: 2017, determine by ICP-OES.
Chromium VI - Ref. to IEC 62321-7-2 Edition 1.0: 2017-03, determine by UV-Vis Spectrometer.

Test results:

		Test No.	T001
		Material No.	M001
Test Parameter	Unit	MDL	Result
Lead (Pb)	mg/kg	1	n.d.
Cadmium (Cd)	mg/kg	1	n.d.
Mercury (Hg)	mg/kg	1	n.d.
Hexavalent Chromium (Cr VI)	mg/kg	3	n.d.

Abbreviation: n.d. = Not Detected (<MDL)
MDL = Method Detection Limit
mg/kg = Milligram per kilogram

Remark:
1. Limit of Quantitation (LOQ) of Pb, Cd, Hg is 2 mg/kg and Cr(VI) is 5 mg/kg
2. Maximum permissible limit for RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU and its amendment Directive (EU) 2015/863 of 31 March 2015;

Elements	Maximum Permissible Limit
Lead (Pb)	1000 mg/kg
Cadmium (Cd)	100 mg/kg
Mercury (Hg)	1000 mg/kg
Hexavalent Chromium (Cr VI)	1000 mg/kg

2. Brominated Flame retardant: PBBs, PBDEs

Test method: PBBs, PBDEs - Ref. to IEC 62321-6 Edition 1.0, 2015-06, determine by GC-MS.

Test Result:

		Test No.	T001
		Material No.	M001
Test Parameter	Unit	MDL	Result
Bromobiphenyl	mg/kg	3	n.d.
Dibromobiphenyl	mg/kg	3	n.d.
Tribromobiphenyl	mg/kg	3	n.d.
Tetrabromobiphenyl	mg/kg	3	n.d.
Pentabromobiphenyl	mg/kg	3	n.d.
Hexabromobiphenyl	mg/kg	3	n.d.
Heptabromobiphenyl	mg/kg	3	n.d.
Octabromobiphenyl	mg/kg	3	n.d.
Nonabromobiphenyl	mg/kg	3	n.d.
Decabromobiphenyl	mg/kg	3	n.d.
Sum Polybrominated biphenyls (PBBs)	mg/kg	--	n.d.
Bromodiphenylether	mg/kg	3	n.d.
Dibromodiphenyl ether	mg/kg	3	n.d.
Tribromodiphenyl ether	mg/kg	3	n.d.
Tetrabromodiphenyl ether	mg/kg	3	n.d.
Pentabromodiphenyl ether	mg/kg	3	n.d.
Hexabromodiphenyl ether	mg/kg	3	n.d.
Heptabromodiphenyl ether	mg/kg	3	n.d.
Octabromodiphenyl ether	mg/kg	3	n.d.
Nonabromodiphenyl ether	mg/kg	3	n.d.
Decabromodiphenyl ether (DecaBDE)	mg/kg	3	n.d.
Sum Polybrominated diphenyl ethers (PBDEs)	mg/kg	--	n.d.

Abbreviation:

n.d.	=	Not Detected (<MDL)
MDL	=	Method Detection Limit
mg/kg	=	Milligram per kilogram
PBBs	=	Polybrominated Biphenyls
PBDEs	=	Polybrominated Diphenyl Ethers

Remark:

1. Limit of Quantitation (LOQ) of each PBBs and PBDEs is 5 mg/kg
2. Maximum permissible limit for RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU and its amendment Directive (EU) 2015/863 of 31 March 2015;

Elements	Maximum Permissible Limit
Polybrominated biphenyls (PBBs)	1000 mg/kg
Polybrominated diphenyl ethers (PBDEs)	1000 mg/kg

Test Report No.: 242138437-07

3. Phthalates content (BBP, DBP, DEHP, DIBP)

Test Method: Phthalates content (BBP, DBP, DEHP, DIBP - Ref. to IEC 62321-8 Edition 1.0: 2017-03 determine by GC-MS

Test Result:

Test No.	Material No.	(mg/kg)			
		BBP	DBP	DEHP	DIBP
		MDL (mg/kg)			
		15	15	15	15
T001	M001	n.d.	n.d.	n.d.	n.d.

Abbreviation:

BBP	=	Benzylbutyl phthalate
DBP	=	Dibutyl phthalate
DEHP	=	Bis(2-ethylhexyl) phthalate
DIBP	=	Diisobutyl phthalate
n.d.	=	Not Detected (<MDL)
MDL	=	Method Detection Limit
mg/kg	=	Milligram per kilogram

Remark:

1. Limit of Quantitation (LOQ) of BBP, DBP, DEHP and DIBP is 50 mg/kg
2. Maximum permissible limit for RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU and its amendment Directive (EU) 2015/863 of 31 March 2015;

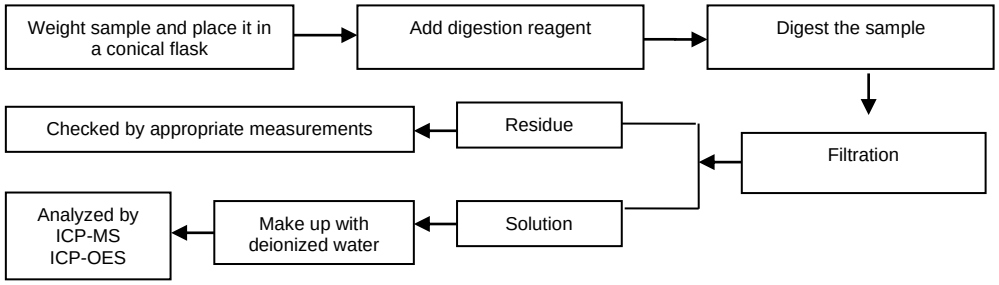
Elements	Maximum Permissible Limit
Benzylbutyl phthalate (BBP)	1000 mg/kg
Dibutyl phthalate (DBP)	1000 mg/kg
Bis(2-ethylhexyl) phthalate (DEHP)	1000 mg/kg
Diisobutyl phthalate (DIBP)	1000 mg/kg

Test Report No.: 242138437-07

Sample Photo

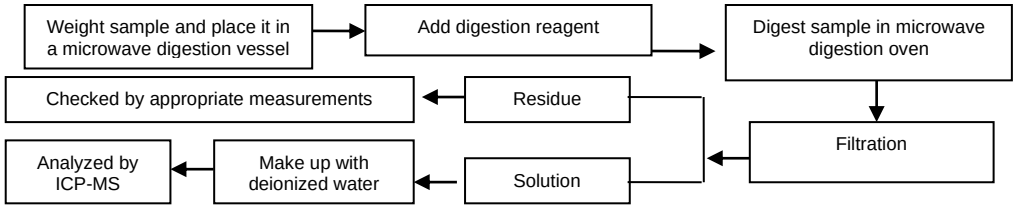
Flow chart of Pb/ Cd Content: IEC 62321-5 Edition 1.0: 2013-06

1) The sample was totally dissolved by pre-conditioning method according to below flow chart
2) Name of the person who made measurement: Phet Netipanya
3) Name of the person in charge of measurement: Phet Netipanya



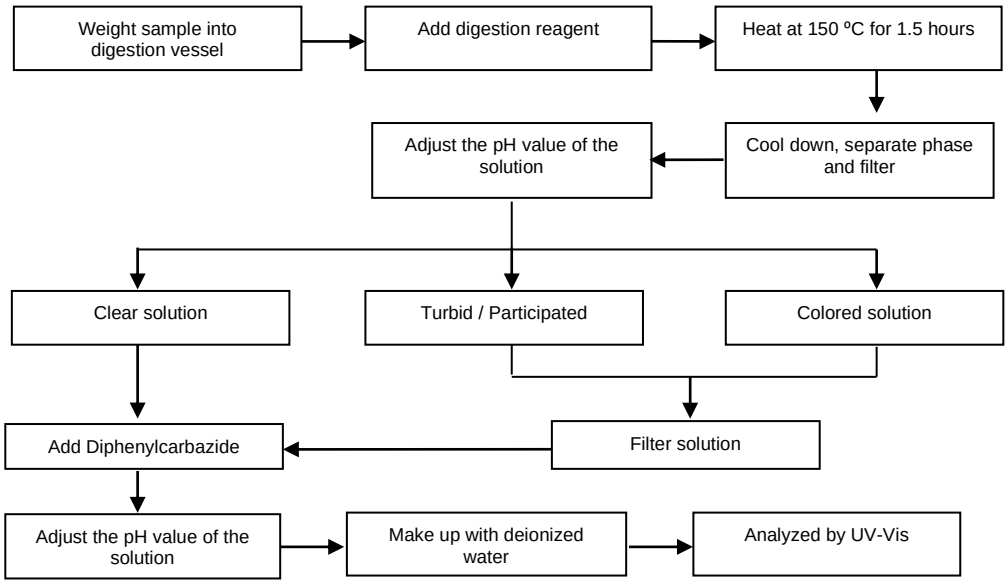
Flow chart of Hg Content: IEC 62321-4: 2013 + AMD 1: 2017

1) The sample was totally dissolved by pre-conditioning method according to below flow chart
2) Name of the person who made measurement: Phet Netipanya
3) Name of the person in charge of measurement: Phet Netipanya



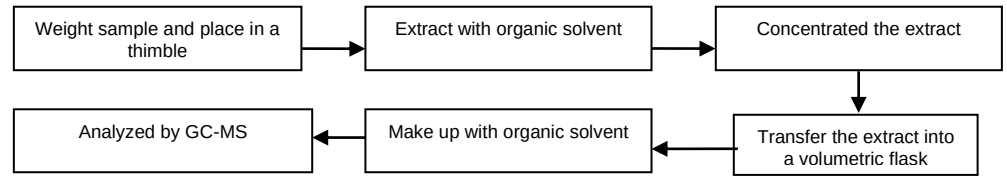
Flow chart of Extraction of Cr (VI) in Insoluble polymers: IEC 62321-7-2 Edition 1.0: 2017-03

1) Name of the person who made measurement: Tidaporn Rittisorn
2) Name of the person in charge of measurement: Tidaporn Rittisorn



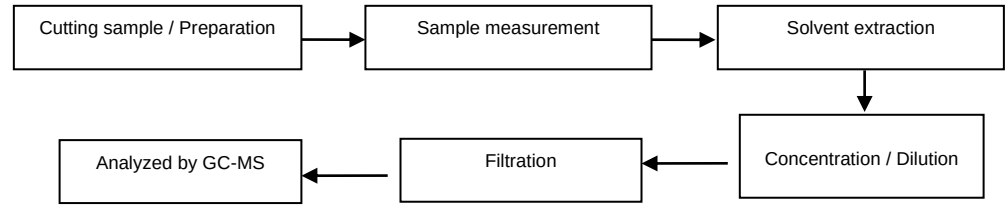
Flow chart of PBBs/ PBDEs Content : IEC 62321-6 Edition 1.0, 2015-06

1) Name of the person who made measurement: Rangrong Tassanapayak
2) Name of the person in charge of measurement: Rangrong Tassanapayak



Flow chart of Phthalates (DBP, BBP, DEHP, DIBP) Content : IEC 62321-8 Edition 1.0: 2017-03

1) Name of the person who made measurement: Atikamas Polampai
2) Name of the person in charge of measurement: Atikamas Polampai



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TÜVRheinland®
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General Terms and Conditions of Business of TÜV Rheinland Thailand Ltd.

1. Scope

1.1 The following terms and conditions apply to agreed services including consultancy services, information, deliveries and similar services as well as ancillary services and other secondary obligations provided within the scope of contract performance.

1.2 The client's General Terms and Conditions of Business, including the client's Terms and Conditions of Purchasing, if any, shall not apply and shall hereby be expressly excluded. No contractual terms and conditions of the client shall form part of the contract even if TÜV Rheinland Thailand Ltd. does not explicitly object to them.

2. Quotations

Unless otherwise agreed, all quotations submitted by TÜV Rheinland Thailand Ltd. shall be subject to change without notice.

3. Coming into effect and duration of contracts

3.1 The contract shall come into effect for the agreed term upon the quotation letter of TÜV Rheinland Thailand Ltd. or a separate contractual document being signed by both contracting parties, or upon the works requested by the client being carried out by TÜV Rheinland Thailand Ltd.. If the client instructs TÜV Rheinland Thailand Ltd. without receiving a prior quotation from TÜV Rheinland Thailand Ltd. (quotation), TÜV Rheinland Thailand Ltd. is – in its sole discretion – entitled to accept the order by giving written notice of such acceptance (including notice sent via electronic means) or by performing the requested services.

3.2 The contract term starts upon the coming into effect of the contract in accordance with article 3.1 and shall continue for the term agreed in the contract.

3.3 If the contract provides for an extension of the contract term, the contract term will be extended by the term provided for in the contract unless terminated in writing by either party with a six-week notice to the end of the contractual term.

4. Scope of services

4.1 The scope of the services shall be decided solely by a unanimous declaration issued by both parties. If no such declaration exists, then the written confirmation of order by TÜV Rheinland Thailand Ltd. shall be decisive.

4.2 The agreed services shall be performed in compliance with the regulations in force at the time the contract is entered into.

4.3 Furthermore, TÜV Rheinland Thailand Ltd. is entitled to determine (in its sole discretion) the method and nature of the assessment unless otherwise agreed in writing or if mandatory provisions require a specific procedure to be followed.

4.4 On execution of the work there shall be no simultaneous assumption of any guarantee of the correctness (proper quality) and working order of either tested or examined parts nor of the installation as a whole and its upstream and/or downstream processes, organisations, use and application in accordance with regulations, nor of the systems on which the installation is based; in particular, no responsibility shall be assumed for the construction, selection of materials and assembly of installations examined, nor for their use and application in accordance with regulations unless these questions are expressly covered by the contract.

4.5 In the case of inspection work, TÜV Rheinland Thailand Ltd. shall not be responsible for the accuracy or checking of the safety programmes or safety regulations

on which the inspections are based, unless otherwise expressly agreed in writing.

5. Performance periods/dates

5.1 The contractually agreed periods and dates of performance are based on estimates of the work involved which are prepared in line with the details provided by the client. They shall only be binding if confirmed as binding by TÜV Rheinland Thailand Ltd. in writing.

5.2 If binding periods of performance have been agreed, these periods shall not commence until the client has submitted all required documents to TÜV Rheinland Thailand Ltd. This also applies, even without express approval by the client, to all extensions of agreed dates for performance not caused by TÜV Rheinland Thailand Ltd..

6. The client's obligation to cooperate

6.1 The client shall guarantee that all cooperation required on its part, its agents or third parties will be provided in good time and at no cost to TÜV Rheinland Thailand Ltd..

6.2 Design documents, supplies, auxiliary staff, etc. necessary for performance of the services shall be made available free of charge by the client. Moreover, collaborative action of the client must be undertaken in accordance with legal provisions, standards, safety regulations and accident prevention instructions.

6.3 The client shall bear any additional cost incurred on account of work having to be redone or being delayed as a result of late, incorrect or incomplete information or lack of proper cooperation. Even where a fixed or maximum price is agreed, TÜV Rheinland Thailand Ltd. shall be entitled to charge extra for such additional expense.

7. Invoicing of work

7.1 If the scope of performance is not laid down in writing when the order is placed, invoicing shall be based on costs incurred. If no payment is agreed in writing, invoicing shall be in accordance with the TÜV Rheinland Thailand Ltd. price list valid at the time of performance.

7.2 Unless otherwise agreed, work shall be invoiced according to the progress of the work.

7.3 If the execution of an order extends over more than one month and the value of the contract or the agreed fixed price exceeds €2,500.00, TÜV Rheinland Thailand Ltd. may demand payments on account or in instalments.

8. Payment terms

8.1 All invoice amounts shall be due for payment without deduction on receipt of the invoice. No discounts shall be granted.

8.2 Payments shall be made to the bank account of TÜV Rheinland Thailand Ltd. as indicated on the invoice, stating the invoice and customer numbers.

8.3 In cases of default of payment, TÜV Rheinland Thailand Ltd. shall be entitled to claim default interest at a rate of 8% above the base interest rate of German central bank (Deutsche Bundesbank). At the same time, TÜV Rheinland Thailand Ltd. reserves the right to claim further damages.

8.4 Should the client default in payment of the invoice despite being granted a reasonable grace period, TÜV Rheinland Thailand Ltd. shall be entitled to cancel the contract, withdraw the certificate, claim damages for non-performance and refuse to continue performance of the contract.

8.5 The provisions set forth in article 8.4 shall also apply in cases involving returned cheques, cessation of payment, and commencement of insolvency proceedings against the client's assets or cases in which the commencement of insolvency proceedings has been dismissed due to lack of assets.

8.6 Objections to the invoices of TÜV Rheinland Thailand Ltd. shall be submitted in writing within two weeks of receipt of the invoice.

8.7 TÜV Rheinland Thailand Ltd. shall be entitled to demand appropriate advance payments.

8.8 TÜV Rheinland Thailand Ltd. shall be entitled to raise its fees at the beginning of a month if overheads and/or purchase costs have increased. In this case, TÜV Rheinland Thailand Ltd. shall notify the client in writing of the rise in fees. This notification shall be issued one month prior to the date on which the rise in fees shall come into effect (period of notice of changes in fees). If the rise in fees remains under 5% per contractual year, the client shall not have any special right of termination. If the rise in fees exceeds 5% per contractual year, the client shall be entitled to terminate the contractual relationship by the end of the period of notice of changes in fees. If the contract is not terminated, the changed fees shall be deemed to have been agreed upon expiry of the above period.

8.9 Only legally established and undisputed claims may be offset against claims by TÜV Rheinland Thailand Ltd.

9. Acceptance

9.1 Any part of the work ordered which is complete in itself may be presented by TÜV Rheinland Thailand Ltd. for acceptance as an instalment. The client shall be obliged to accept it immediately.

9.2 If the client fails to fulfil its acceptance obligation immediately, acceptance shall be deemed to have taken place 4 calendar weeks after performance of the work if TÜV Rheinland Thailand Ltd. has specifically made the client aware of the aforementioned deadline upon performance of the service.

10. Confidentiality

10.1 For the purpose of this agreement, "confidential information" means all information, documents, images, drawings, know-how, data, samples and project documentation which one party (the "disclosing party") hands over, transfers or otherwise discloses to the other party (the "receiving party"). Confidential information also includes paper copies and electronic copies of such information.

10.2 The disclosing party shall mark all confidential information disclosed in written form as confidential before passing it on to the receiving party. The same applies to confidential information transmitted by e-mail. If confidential information is disclosed orally, the receiving party shall be appropriately informed in advance.

10.3 All confidential information which the disclosing party transmits or otherwise discloses to the receiving party in accordance with this agreement:

a) may only be used by the receiving party for the purposes of performing the purpose of the contract, unless expressly otherwise agreed in writing with the disclosing party;

b) may not be copied, distributed, published or otherwise disclosed by the receiving party, unless this is necessary for fulfilling the purpose of the contract or TÜV Rheinland Thailand Ltd. is

TÜV Rheinland Thailand Ltd.
18/F, Tararom Business Tower
2445/36-38 New Petchburi Road
Bangkapi, Huay Kwang,
Bangkok 10320 Thailand

Tel. +66 2 326 1333
Fax. +66 2 326 1334-5
Email: info@tha.tuv.com
Web: www.tuv.com

required to pass on confidential information, inspection reports or documentation to the authorities or third parties that are involved in the performance of the contract;

c) must be treated by the receiving party with the same level of confidentiality as the receiving party uses to protect its own confidential information, but never with a lesser level of confidentiality than that which is objectively required.

10.4 The receiving party shall disclose any confidential information received from the disclosing party only to those of its employees who need this information to perform the services required for the subject matter of this contract. The receiving party undertakes to oblige these employees to observe the same level of secrecy as set forth in this confidentiality clause.

10.5 Information for which the receiving party can furnish proof that:

a) it was generally known at the time of disclosure or has become general knowledge without violation of this agreement; or

b) it was disclosed to the receiving party by a third party entitled to disclose this information; or

c) the receiving party already possessed this information prior to disclosure by the disclosing party; or

d) the receiving party developed it itself, irrespective of disclosure by the disclosing party, shall not be deemed to constitute "confidential information" as defined in this agreement.

10.6 All confidential information shall remain the property of the disclosing party. The receiving party hereby agrees to immediately (i) return all confidential information, including all copies, to the disclosing party, and/or, on request by the disclosing party, to (ii) destroy all confidential information, including all copies, and confirm the destruction of this confidential information to the disclosing party in writing, at any time if so requested by the disclosing party but at the latest and without special request after termination or expiry of this contract. This does not extend to include reports and certificates prepared for the client solely for the purpose of fulfilling the obligations under this contract, which shall remain with the client. However, TÜV Rheinland Thailand Ltd. is entitled to make file copies of such reports, certificates and confidential information that form the basis for preparing these reports and certificates in order to evidence the correctness of its results and for general documentation purposes.

10.7 From the start of this contract and for a period of three years after termination or expiry of this contract, the receiving party shall maintain strict secrecy of all confidential information and shall not disclose this information to any third parties or use it for itself.

11. Copyrights

11.1 TÜV Rheinland Thailand Ltd. shall retain all exclusive and joint copyrights in the expert reports, test results, calculations, presentations etc. prepared by TÜV Rheinland Thailand Ltd..

11.2 The client may only use expert reports, test results, calculations, presentations etc. prepared within the scope of the contract for the contractually agreed purpose.

11.3 The client may use test reports, test results, expert reports, etc. only complete and unshortened. Any publication or duplication for advertising purposes needs the prior written approval of TÜV Rheinland Thailand Ltd..

12. Liability of TÜV Rheinland Thailand Ltd.

12.1. Irrespective of the legal basis and in particular in the event of a breach of contractual obligations and tort, the liability of TÜV Rheinland Thailand Ltd. for all damage, loss and reimbursement of expenses caused by legal representatives and/or employees of TÜV Rheinland Thailand Ltd. shall be limited to: (i) in the case of contract with a fixed overall fee, ten times the overall fee for the entire contract; (ii) in the case of contracts for annually recurring services, to the agreed annual fee; (iii) in the case of contracts expressly charged on a time and material basis to a maximum of 20,000 Euro and (iv) in the case of framework agreements that provide for the possibility of placing individual orders, to an amount equal to three times the fee for the individual order under which the damage occurred. The maximum liability of TÜV Rheinland Thailand Ltd. is limited in any event of damage or loss to 2.5 Mio Euro.

12.2. The limitation of liability according to article 12.1 above shall not apply to all damage and losses caused by malice, intent or gross negligence on the part of any of the legal representatives of TÜV Rheinland Thailand Ltd. or their vicarious agents. Such limitation shall also not apply to damages arising from a violation of obligations which TÜV Rheinland Thailand Ltd. has guaranteed to perform, damages caused by a person's death, physical injury or illness, or damages for which liability is assumed under the Thai Law.

12.3 In cases involving a fundamental breach of contract, TÜV Rheinland Thailand Ltd. will be liable even where minor negligence is involved. For this purpose, a "fundamental breach" is a material contractual obligation, the performance of which permits the due performance of the contract and which the client may rely on being complied with. Any claim for damages for a fundamental breach of contract shall be limited to the amount of damage reasonably foreseen as a possible consequence of such breach of contract at the time of the breach (reasonably foreseeable damage), unless any of the circumstances described in article 12.2 apply.

12.4 TÜV Rheinland Thailand Ltd. shall not be liable for personnel made available by the client to support TÜV Rheinland Thailand Ltd. in the performance of its services regulated under this contract, unless personnel made available may be regarded as vicarious agents of TÜV Rheinland Thailand Ltd.. If TÜV Rheinland Thailand Ltd. is not liable for personnel made available by the client under the foregoing provision, the client shall indemnify TÜV Rheinland Thailand Ltd. against any claims made by third parties.

12.5 The limitation periods for claims for damages shall be based on statutory provisions.

12.6 None of the provisions of this article 12 changes the burden of proof to the disadvantage of the client.

13. Partial invalidity, written form, place of jurisdiction

13.1 No ancillary agreements to this contract have been concluded.

13.2 All amendments and supplements must be in writing in order to be effective; this also applies to amendments and supplements to the requirement for the written form.

13.3 Should one or several of the provisions under this contract be or become ineffective, the contracting parties shall replace the invalid provision with a legally valid provision that comes closest to the content of the invalid provision in legal and commercial terms.

13.4 The place of jurisdiction for all disputes arising in connection with this contract shall be Bangkok, Thailand. This contract is governed by the Thailand substantive law.

Status: July 19, 2013

TÜV Rheinland Thailand Ltd.
18/F, Tararom Business Tower
2445/36-38 New Petchburi Road
Bangkapi, Huay Kwang,
Bangkok 10320 Thailand

Tel. +66 2 326 1333
Fax. +66 2 326 1334-5
Email: info@tha.tuv.com
Web: www.tuv.com