

Confidential Technical Report
44633

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TECHNOLOGY

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PROJECT NO: AM0150

FOOD CONTACT APPROVAL OF CARBON BLACK MATERIALS

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FOOD CONTACT APPROVAL OF CARBON BLACK MATERIALS

1. INTRODUCTION

A batch of carbon black samples were supplied to Rapra Technology Limited on the 29th April, 2005. The samples were stated as being produced at Kremenchug Carbon Black Plant, Ukraine using locally sourced Anthracene Oil feedstock and were designated by their grades (as determined by ASTM D1765) as follows:

N220

N330

Testing of the samples to EU Resolution AP (89) 1 for levels of toluene extractables and heavy metals was requested.

2. EXPERIMENTAL

2.1 Toluene Extractables

A portion of each carbon black sample as received was dried in a thermostatically controlled oven at 105°C for 1 hour. After 1 hour, the carbon black was transferred in to a dessicator and cooled to room temperature.

A 10.0g portion of each dried carbon black sample was then subjected to a soxhlet extraction with toluene for 8 hours. After 8 hours testing, the test solutions were gently evaporated to dryness in pre-conditioned glass dishes on a water bath. The dried dishes were then finally dried at 140°C for 2 hours before being cooled and reweighed.

Testing was undertaken on each sample in duplicate.

2.2 Heavy Metals

A portion of each carbon black sample as received was analysed for levels of heavy metals using the technique of Atomic Absorption (or Inductively Coupled Argon Plasma Spectrometry). Testing was undertaken at an external laboratory.

All analytical testing was undertaken between 10th May and 25th May, 2005.

3. RESULTS

3.1 Toluene Extractables.

The level of toluene extractables from the carbon black samples was determined as follows:

Sample	% toluene extractables	Mean
N220	0.02, 0.02	0.02
N330	0.05, 0.06	0.06

The permitted level of toluene extractables according to Resolution AP (89) 1 is 0.15%. The levels obtained from both batches of carbon black are well within this limit.

3.2 Heavy Metals.

The level of toxic heavy metals in the carbon black samples has been determined as follows:

Element	% present		Resolution limit
	N220	N330	
Arsenic	<0.0005	<0.0005	0.01%
Barium	<0.0005	<0.0005	0.01%
Cadmium	<0.0005	<0.0005	0.01%
Chromium	<0.0005	<0.0005	0.1%
Mercury	<0.0005	<0.0005	0.005%
Lead	<0.0005	<0.0005	0.01%
Antimony	<0.0005	<0.0005	0.05%
Selenium	<0.0005	<0.0005	0.01%

The levels of heavy metals found in the carbon black samples are within the limits as stated in Resolution AP (89) 1.

4. CONCLUSIONS

The batch of 2 carbon black samples (designated N220 and N330) supplied to Rapra on the 29th April, 2005 have been analysed to determine the levels of toluene extractables and heavy metals according to Resolution AP (89) 1.

From the analytical data obtained, the level of toluene extractables and heavy metals in both carbon black samples was found to conform to the specifications of Resolution AP (89) 1.

All data is as reported in the Results section of this report.

**RAPRA TECHNOLOGY LIMITED UNITED KINGDOM
CONDITIONS OF BUSINESS**

FORMATION OF CONTRACT

- 1.1 All quotations are made and all orders are accepted subject to the following conditions. All other terms, conditions or warranties whatsoever are excluded from any contract between the parties unless expressly accepted by Rapra Technology Limited ("Rapra") in writing.
- 1.2 Quotations shall be available for acceptance for a maximum period of 30 days from the dates thereof and may be withdrawn by Rapra within such period at any time by written or oral notice. "Work" shall mean the work and services that Rapra agree to provide in the quotation.
- 1.3 If any statement or representation has been made to the Client by Rapra, or its employees upon which the Client relies (other than in the documents enclosed with Rapra's quotation) then the Client must set out that statement or representation in a document to be attached to the return copy of the quotation and in any such case Rapra may accept or reject the same and/or submit a new quotation.
- 1.4 The supply of materials, products or information by the Client pursuant to the quotation shall constitute acceptance of these conditions where acceptance has not previously been communicated by the Client to Rapra.

PRICES

- 2.1 All prices are, unless otherwise stated, quoted net exclusive of VAT.
- 2.2 All requests for variations or addition to the Work must be made by the Client in writing. In the event of any variation or addition being so requested and agreed to by Rapra, Rapra shall be entitled to make an adjustment to the contract price fairly reflecting such variation or addition.

PAYMENT

- 3.1 Unless otherwise agreed by Rapra in writing the terms of payment shall be 30 days from receipt of invoice by the Client, which shall be deemed to be two working days after posting. Rapra may submit interim invoices in respect of each stage of Work completed for the Client.
- 3.2 No disputes arising under the contract nor delays beyond the reasonable control of Rapra shall interfere with prompt payment in full by the Client.
- 3.3 In the event of default in payment by the Client Rapra shall be entitled at its option to treat the whole contract as repudiated by the Client or to suspend all further work on any contract or contracts between Rapra and the Client without notice and to charge interest on any amount outstanding at the rate of 2% per annum above the Base Rate of National Westminster Bank plc in force at the time when payment was due.

COMPLETION

- 4.1 Time for completion of Work is given as accurately as possible but is not guaranteed. The Client shall have no right to damages or to cancel the order for failure for any cause to meet any time stated for completion of Work.
- 4.2 Any estimate of the date of completion of Work shall in every case be dependent upon prompt receipt of all necessary information, instructions or approvals from the Client. Variations or additions to the Work requested by the Client may result in delay in completion.

CANCELLATION

5. Either party may cancel the contract on 30 days written notice to the other on condition that all costs and expenses incurred by Rapra up to the time of cancellation and, where cancellation is at the insistence of the Client, all loss of profits and other loss or damage resulting to Rapra by reason of such cancellation, will be paid forthwith by the Client to Rapra.

LIABILITY

- 6.1 Rapra undertakes that it will indemnify and keep the Client indemnified against all liabilities, costs and expenses in respect of claims in relation to death or injury to persons or damage to tangible property to the extent that such death, injury, loss or damage is attributable to the negligent acts or omissions of Rapra, its officers, employees, agents or sub-contractors.
- 6.2 Save where Rapra is shown to have failed to exercise reasonable care in the performance of the Work and such failure results in death or personal injury, Rapra shall not be liable in respect of claims arising by reason of death or personal injury. Further, under no circumstances whatsoever shall Rapra be liable for consequential loss, loss of profits, damage to property or wasted expenditure.
- 6.3 Rapra's liability, whether in respect of one claim or the aggregate of various claims other than claims for death or personal injury due to negligence on the part of Rapra shall not exceed £500,000 in any Year and the Client agrees to insure adequately to cover claims in excess of such amount.

CONFIDENTIAL INFORMATION AND INDUSTRIAL PROPERTY RIGHTS

- 7.1 All data, information and reports are produced for the benefit of the addressee only. Rapra accepts no liability arising from unauthorised use of such information or reports by a third party.
- 7.2 The Client shall not reproduce or abstract for the purpose of advertising or otherwise any report or other information on the Work or use the name of Rapra either expressly or by implication in any of its advertising or sales promotional material without the prior written consent of the Company Secretary of Rapra.
- 7.3 All drawings, documents, confidential records, computer software and other information supplied by Rapra are supplied on the express understanding that copyright is reserved to Rapra and that the Client will not, without the written consent of Rapra, either give away, loan, exhibit or sell any such drawings, documents, records, software or other information or extracts therefrom or copies thereof or use them in any way except in connection with the Work in respect of which they are issued.
- 7.4 All Intellectual Property Rights belonging to or otherwise in the control of either party prior to entering into the contract shall remain the property of the party owning such Intellectual Property Rights.
- 7.5 All title and ownership of, or relating to, any intellectual property, including, but not limited to ideas, inventions, discoveries, creations, improvements or any other property subject to patent protection or intellectual property rights as developed or resulting from work under this agreement, shall directly or indirectly be solely owned by Rapra Technology Ltd, unless otherwise agreed to in writing by all participating parties.
- 7.6 In the event that Rapra Technology Ltd does not wish to apply for or maintain patent protection for any invention owned by it in accordance with clause 7 herein, it will on request assign its rights in respect of that patent to the client but in any event Rapra Technology Ltd shall be granted a royalty free, irrevocable, non-exclusive, world-wide right to use such intellectual Property Rights assigned under this condition 7.6.

SAMPLES

8. Rapra retains the right to return or dispose of the samples at the customers cost after a period of 6 months unless otherwise agreed with the client. Storage of the samples beyond the initial 6 month period will be charged for, invoiced in advance for the agreed period (minimum additional 6 months).

CUSTOMER'S INFORMATION

- 9.1 The Client shall be solely responsible for ensuring that all drawings, information, advice and recommendations given to Rapra, either directly or indirectly by the Client or by the Client's agents, servants, consultants or advisers, are accurate and sufficient for completion of the Work. Examination or consideration by Rapra of such drawings, information, advice or recommendations shall in no way limit the Client's responsibility hereunder unless Rapra specifically agrees in writing to accept responsibility.
- 9.2 Rapra shall not disclose to any third party any knowledge or information relating to the Work which is, on receipt by Rapra, marked 'confidential' by the Client unless and until such information becomes public knowledge.

INSOLVENCY

10. If either party shall become bankrupt or under the provisions of Section 123 of the Insolvency Act 1986 is deemed to be unable to pay its debts or compounds with creditors or in the event of a resolution being passed or proceedings commenced for its administration or liquidation (other than for a voluntary winding up for the purposes of reconstruction or amalgamation) or if a Receiver or Manager is appointed of all or any part of its assets or undertaking, the other party shall be entitled to cancel the contract in whole or in part by notice in writing without prejudice to any other right or remedy accrued or accruing to that party.

FORCE MAJEURE

11. In the event of the performance of any obligation accepted by Rapra being prevented, delayed, or in any way interfered with by direction of government, war, industrial dispute, strike, breakdown of machinery or plant, accident, fire or by any other cause beyond Rapra's control Rapra may at its option suspend performance or cancel its obligations under the contract without liability for any damage or consequential loss resulting therefrom, such suspension or cancellation being without prejudice to Rapra's right to recover all sums owing to it in respect of works performed and costs incurred prior to the date of suspension or cancellation.

ASSIGNMENT

12. This Contract is personal to the parties and may not be assigned or transferred without the prior written consent of the other party.

LEGAL

13. The contract shall be governed and interpreted exclusively according to the Law of England and shall be subject to the jurisdiction of the English Courts only.