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Dresden, 2015-05-15  
50 - br/ku/zn

## Test Report Order no. 2515010

**Client:** Unilin Flooring BVBA  
Ooigemstraat 3  
8710 Wielsbeke  
Belgium

**Date of order:** 2015-01-08

**Order:** Determination of the VOC and formaldehyde emission of a laminate flooring according to AgBB-Scheme, ISO 16000 part 3, 6 and 9,  
**QuickStep Impressive Laminate**

**Contractor:** EPH – Laboratory Chemical Testing

**Engineer in charge:** Dipl.-Ing. M. Broege



Dipl.-Chem. Karsten Aehlig  
Head of Laboratory Chemical Testing

The test report contains 3 pages and 10 annex. Any duplication, even in part, requires written permission of EPH. These test results are exclusively related to the tested material.

## 1. Assignment

Accomplishment of an emission test based on the AgBB-Scheme

## 2. Sample identification

Product name: **QuickStep Impressive laminate**

## 3. Product description

Type: laminate flooring

Thickness: 12 mm

## 4. Sampling

Charge: no information

Date of production: no information

Sampling: by client

Date of sampling: no information

Packaging material: carton and foil

Number: 1 package

Sample receipt at EPH: 08.01.2015

## 5. Emission measurement

*Chamber test* – ISO 16000 part 9

The test piece (0.09 m<sup>2</sup>) was placed into a test chamber – lying on the bottom – under the following conditions:

Temperature: 23 °C ± 1 K

Air humidity: 50 % ± 5 %

Air exchange rate: 0.5 / h ± 0.1 /h

Loading: 0.4 m<sup>2</sup>/m<sup>3</sup>

Chamber volume: 0.225 m<sup>3</sup>

Storage: 13.01.2015

During the test the climatic parameters temperature and relative air humidity were recorded. Data for chamber test are documented on the enclosed page "measurement parameters".

## 6. Analytics

*Volatile organic compounds (VOC)* – ISO 16000 part 6

The determination of the VOC was carried out by gaschromatography after previous adsorption on tenax and following thermodesorption with cryo focussion (GC-MS).

Sample air volume: 1 – 6 l

- |                |            |                      |
|----------------|------------|----------------------|
| 1. Measurement | after 3 d  | double determination |
| 2. Measurement | after 7 d  | double determination |
| 3. Measurement | after 28 d | double determination |

*Formaldehyde / Aldehydes – ISO 16000 part 3*

The determination of formaldehyde and other aldehydes was carried out by DNPH-method.

Sample air volume: 120 l

- |                |            |                      |
|----------------|------------|----------------------|
| 1. Measurement | after 3 d  | double determination |
| 2. Measurement | after 7 d  | double determination |
| 3. Measurement | after 28 d | double determination |

## 7. Results

*VOC-Emission*

The following printouts are attached to the report:

General information

Measurement parameters

General view of the results

Single values – Emissions after 3 days

Single values – Emissions after 7 days

Single values – Emissions after 28 days

Photo

Chromatogram after 3 days

Chromatogram after 7 days


Chromatogram after 28 days

*Formaldehyde*

- |                |                         |
|----------------|-------------------------|
| 1. Measurement | 0.014 ppm after 3 days  |
| 2. Measurement | 0.013 ppm after 7 days  |
| 3. Measurement | 0.013 ppm after 28 days |

Requirements after 28 days: 0.1 ppm

**The tested product “QuickStep Impressive laminate” fulfills the requirements of the AgBB-Scheme and “DIBt-Principles for health assessment of construction products in interiors”.**

  
Dipl.-Ing. M. Broege  
Engineer in charge



1. Allgemeine Angaben - General information																																														
Prüfstelle Testing laboratory	Entwicklungs- und Prüflabor Holztechnologie GmbH																																													
Verantwortlicher Prüfer Responsible laboratory staff	Dipl.-Ing. M. Broege																																													
Prüfberichts-nr. Number of the test report	2515010																																													
Kunde/Antragsteller Client/Applicant	Unilin Flooring BVBA																																													
Produktname und Artikelnr. Name of the product and material number	QuickStep Impressive laminate																																													
Aktenzeichen beim DIBt File number at DIBt	Stellen- zeichen	SVA-Nr.	Sachgebiet	lfd. Nr.	Jahr (2 Ziffern)	Unter- sachgebiet																																								
	-1.																																													
Art der Prüfung Type of testing	A	S <sub>D</sub>	S <sub>C</sub>	S <sub>CL</sub>																																										
	28																																													
Probenbezeichnung Name of the sample	QuickStep Impressive laminate																																													
Datum des Probeneingangs bei der Prüfstelle Date of receipt of the sample	08.01.2015																																													
Lagerung der Probe bis zur Prüfung Storage of the sample until testing	carton and foil																																													
2. Beschreibung des Bauprodukts - Description of the construction product																																														
Bitte auswählen! Choose, please!	<input type="radio"/> Textile Bodenbeläge - Textile floor coverings <input type="radio"/> Laminate und Paneele - Laminates and panels <input type="radio"/> Parkette und Holzfußböden - Parquet and wood floorings <input type="radio"/> Elastische Bodenbeläge - Resilient floor coverings <input type="radio"/> Beschichtungen - Coatings <input type="radio"/> Korkbodenbeläge - Cork floor coverings <input type="radio"/> Sportbodenbeläge - Surfaces for sport areas <input type="radio"/> Oberflächenbeschichtungen - Surface coatings <input type="radio"/> Bodenbelagskleber - Adhesives for floor coverings <input type="radio"/> Verlegeunterlagen - Underlayers <input type="radio"/> Sonstige Produkte - Other products																																													
	<table border="1"> <thead> <tr> <th>Laminate und Paneele - Laminates and panels</th> <th>Herstellerangaben Manufacturer's data</th> <th>Prüfstellenangaben Testing laboratory's data</th> </tr> </thead> <tbody> <tr> <td>Allgemeine Produktbeschreibung General description of the product</td> <td>laminate flooring</td> <td>laminate flooring</td> </tr> <tr> <td>Abmessung der gelieferten Probe [mm x mm] Dimensions of the delivered sample [mm x mm]</td> <td></td> <td></td> </tr> <tr> <td>Originalabmessung eines Elements [mm x mm] Original dimension of an element [mm x mm]</td> <td></td> <td></td> </tr> <tr> <td>Gesamtdicke [mm] Total thickness [mm]</td> <td>12</td> <td>12</td> </tr> <tr> <td>Flächengewicht [g/m<sup>2</sup>] Area weight [g/m<sup>2</sup>]</td> <td></td> <td>7255</td> </tr> <tr> <td rowspan="2">Verlegeunterlage/Trittschalldämmung (falls vorhanden) Underlayer/Impact sound insulation (if relevant)</td> <td>Produktbeschreibung Product description</td> <td></td> </tr> <tr> <td>Dicke [mm] Thickness [mm]</td> <td></td> </tr> <tr> <td rowspan="2">Kleber für Verlegeunterlage/Trittschalldämmung Adhesive used for underlayer/impact sound insulation</td> <td>Bezeichnung Product name</td> <td></td> </tr> <tr> <td>Auftragsmenge [g/m<sup>2</sup>] Applied quantity [g/m<sup>2</sup>]</td> <td></td> </tr> <tr> <td>Fasen vorhanden? Bevels?</td> <td></td> <td></td> </tr> <tr> <td>Art der Verbindung der Laminatepaneele untereinander (z.B. Click-Verbindung, Nut &amp; Feder) Joint structure of laminate panels (e.g. click connection, slot &amp; key)</td> <td>click</td> <td>click</td> </tr> <tr> <td>Kantenabdeckung? Verhältnis der offenen zu den abgedeckten Kanten? Covering of the edges? Ratio of covered edges to uncovered edges?</td> <td></td> <td>completely closed</td> </tr> <tr> <td>weitere Angaben Additional information</td> <td></td> <td></td> </tr> </tbody> </table>							Laminate und Paneele - Laminates and panels	Herstellerangaben Manufacturer's data	Prüfstellenangaben Testing laboratory's data	Allgemeine Produktbeschreibung General description of the product	laminate flooring	laminate flooring	Abmessung der gelieferten Probe [mm x mm] Dimensions of the delivered sample [mm x mm]			Originalabmessung eines Elements [mm x mm] Original dimension of an element [mm x mm]			Gesamtdicke [mm] Total thickness [mm]	12	12	Flächengewicht [g/m <sup>2</sup> ] Area weight [g/m <sup>2</sup> ]		7255	Verlegeunterlage/Trittschalldämmung (falls vorhanden) Underlayer/Impact sound insulation (if relevant)	Produktbeschreibung Product description		Dicke [mm] Thickness [mm]		Kleber für Verlegeunterlage/Trittschalldämmung Adhesive used for underlayer/impact sound insulation	Bezeichnung Product name		Auftragsmenge [g/m <sup>2</sup> ] Applied quantity [g/m <sup>2</sup> ]		Fasen vorhanden? Bevels?			Art der Verbindung der Laminatepaneele untereinander (z.B. Click-Verbindung, Nut & Feder) Joint structure of laminate panels (e.g. click connection, slot & key)	click	click	Kantenabdeckung? Verhältnis der offenen zu den abgedeckten Kanten? Covering of the edges? Ratio of covered edges to uncovered edges?		completely closed	weitere Angaben Additional information	
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3. Bemerkungen (z.B. Produktbesonderheiten, Abweichungen von "Grundsätzen zur gesundheitlichen Bewertung von Bauprodukten in Innenräumen" etc.) (neue Zeile mit [ALT] + [RETURN]) Comments (e.g. particularities on the product, variation of the "Principles for health assessment of construction products used in interiors" etc.) (new line with [ALT] + [RETURN])																																														



<b>Produktname - Name of the product</b>		QuickStep Impressive laminate	
Datum der Prüfkörperherstellung Date of the manufacture of the test specimen		13.01.2015	
Herstellung des Prüfkörpers durch Preparation of the test specimen by		EPH	
verwendete Hilfsmaterialien used auxiliary materials			

Prüfung - Testing		Datum date	Uhrzeit time
Beginn der Vorkonditionierung Start of preconditioning	$t_{0-x}$		
Einbringen der Probe in die Prüfkammer und Beginn der Prüfung Placing of the test specimen into the test chamber and start of testing	$t_0$	13.1.2015	16:45
erste Probenahme first sampling	$t_{3d}$	16.1.2015	8:20
zweite Probenahme second sampling	$t_{7d}$	20.1.2015	12:15
dritte Probenahme third sampling	$t_{28d}$	10.2.2015	9:30
Prüfkörperanordnung in der Prüfkammer Arrangement of the test specimen in the test chamber		bottom of chamber	
Anwendung der Abbruchkriterien Use of the break-off criteria	3d/7d	no	

Prüfkammer - Test chamber			
Hersteller/Typ der Prüfkammer Manufacturer/type of the test chamber			
Material der Prüfkammer Material of the test chamber		glass	
Volumen der Prüfkammer Volume of the test chamber	[m <sup>3</sup> ]	0,23	
Fläche der Probe Area of the test specimen	[m <sup>2</sup> ]	0,09	
Luftwechselrate Air exchange rate	[h <sup>-1</sup> ]	0,50	
flächenspezifische Luftdurchflussrate q Area specific air flow rate	[mh <sup>-1</sup> ]	1,25	
Temperatur Temperature	[°C]	23,0	
relative Luftfeuchte relative humidity	[%]	50,0	

Berücksichtigungsgrenzen - Limits of consideration	$C_i$ [ $\mu\text{g}/\text{m}^3$ ]	
Substanzen mit NIK-Wert Substances with LCI value	5	*) mit Ausnahme aller cancerogenen Substanzen, hier gilt Nachweisgrenze with exception of all carcinogenic substances, detection limit applies here
alle anderen Substanzen*) all other substances	5	
LCI list 2012		
AqBB scheme 2012		

Anmerkungen zur Prüfung (neue Zeile mit [ALT] + [RETURN]) Comments on testing (new line with [ALT] + [RETURN])



<b>Probenbezeichnung</b> Name of the sample	QuickStep Impressive laminate										
<b>Aktenzeichen beim DIBt</b> File number of DIBt											
<b>Prüfinstitut</b> Testing laboratory	Entwicklungs- und Prüflabor Holztechnologie GmbH										
<b>Ergebnisüberblick</b> General view of the results  ADAM_2012_08_1	<b>3 Tage (days)</b>					<b>7 Tage (days)</b>			<b>28 Tage (days)</b>		
	Ergebnisse results	AgBB Anforderungen requirements		Abbruchkriterien break-off criteria		Ergebnisse results	Abbruchkriterien break-off criteria		Ergebnisse results	AgBB Anforderungen requirements	
	µg/m³	mg/m³		mg/m³		µg/m³	mg/m³		µg/m³	mg/m³	
[A] TVOC (C <sub>6</sub> - C <sub>16</sub> )	413	0	≤ 10 mg/m³	0,4 !! ≤ 0,3 mg/m³	337	0,3	≤ 0,5 mg/m³	129	0,1	≤ 1,0 mg/m³	
[B] Σ SVOC (C <sub>16</sub> - C <sub>22</sub> )	0	keine none		0,00 ≤ 0,03 mg/m³	0	0,00	≤ 0,05 mg/m³	0	0,0	≤ 0,1 mg/m³	
[C] R (dimensionlos/dimensionless)	0,093	keine none		0,1 ≤ 0,5	0,087	0,1	≤ 0,5	0,034	0	≤ 1	
[D] Σ VOC o. NIK without LCI	0	keine none		0,00 ≤ 0,05 mg/m³	0	0,00	≤ 0,05 mg/m³	0	0,0	≤ 0,1 mg/m³	
[E] Σ Cancerogene	0	0,00	≤ 0,01 mg/m³	0,000 ≤ 0,001 mg/m³	0	0,000	≤ 0,001 mg/m³	0	0,000	≤ 0,001 mg/m³	
<b>Dieser Block liefert zusätzliche Information</b> This part gives some additional information											
[F] VVOC (< C <sub>6</sub> )	18				16			16			
[G] VOC (C <sub>6</sub> - C <sub>16</sub> ) als Toluoläquivalent as toluene equivalent		← Wert manuell eingeben! Enter value manually!				← Wert manuell eingeben! Enter value manually!			← Wert manuell eingeben! Enter value manually!		
[H] Formaldehyd Formaldehyde	18	keine none		0,018 ≤ 0,060 mg/m³	16	0,016	≤ 0,060 mg/m³	16	0,016	≤ 0,120 mg/m³	

Emissionen nach 3 Tagen Emission after 3 days				Retentionsbereich Retention range	Quantifizierung Quantification	Identifikation Identification	C <sub>i</sub> [µg/m <sup>3</sup> ]	SER <sub>i</sub> [µg/m <sup>2</sup> h]	Zuordnung Classification [canc./NIK/o.NIK] [carc./LCI/no LCI]	R <sub>i</sub>	Ifd. Nr Serial number	Legende legend ----- VVOC = < C6 VOC = C6 - C16 SVOC = C16 - C22 ----- a = substanzspezifisch substance-specific b = substanzähnlich substance-like c = Toluoläquivalent toluene equivalent d = DNPH ----- 1 = Klasse 1 class 1 2 = Klasse 2 class 2 3 = Klasse 3 class 3
QuickStep Impressive laminate	Kommentar Comment	CAS-No.	RT [min]									
gefundene Substanzen Detected substances	Daten nur über den Button "Messergebnisse eingeben/löschen" in diese Tabelle eintragen Data to be entered only via the button "enter/delete results"											
Formaldehyd		50-00-0	4,29	VVOC	d	1	18	22,50			7-22	1
Essigsäure		64-19-7	5,60	VOC	a	1	28	35,00	1250	0,022	9-1	1
2-Methoxy-1-methylethylacetat		108-65-6	13,50	VOC	a	1	10	12,50	2700	0,004	10-6	1
alpha-Pinen		80-56-8	17,20	VOC	a	1	6	7,50	1500	0,004	3-2	1
Dipropylenglykolmono-methylether gesättigte aliphatische		34590-94-8	20,90	VOC	a	1	13	16,25	3100	0,004	6-12	1
Kohlenwasserstoffe ab C9 bis C16			25,00	VOC	a	1	356	445,00	6000	0,059	2-10	1

Emissionen nach 7 Tagen Emission after 7 days				Retentionsbereich Retention range	Quantifizierung Quantification	Identifikation Identification	C <sub>i</sub> [µg/m <sup>3</sup> ]	SER <sub>i</sub> [µg/m <sup>2</sup> h]	Zuordnung Classification [canc./NIK/o.NIK] [carc./LCI/no LCI]	R <sub>i</sub>	Ifd. Nr Serial number	ADAM_2012_08_1	Legende legend ----- VVOC = < C6 VOC = C6 - C16 SVOC = C16 - C22 ----- a = substanzspezifisch substance-specific b = substanzähnlich substance-like c = Toluoläquivalent toluene equivalent d = DNPH ----- 1 = Klasse 1 class 1 2 = Klasse 2 class 2 3 = Klasse 3 class 3
QuickStep Impressive laminate	Kommentar Comment	CAS-No.	RT [min]										
gefundene Substanzen Detected substances	Daten nur über den Button "Messergebnisse eingeben/löschen" in diese Tabelle eintragen Data to be entered only via the button "enter/delete results"												
Formaldehyd		50-00-0	4,29	VVOC	d	1	16	20,00			7-22	1	
Essigsäure		64-19-7	5,60	VOC	a	1	42	52,50	1250	0,034	9-1	1	
2-Methoxy-1-methylethylacetat		108-65-6	13,50	VOC	a	1	8	10,00	2700	0,003	10-6	1	
alpha-Pinen		80-56-8	17,20	VOC	a	1	4	5,00	1500	0,003	3-2	1	
Dipropylenglykolmono-methylether gesättigte aliphatische		34590-94-8	20,90	VOC	a	1	11	13,75	3100	0,004	6-12	1	
Kohlenwasserstoffe ab C9 bis C16			25,00	VOC	a	1	276	345,00	6000	0,046	2-10	1	



Emissionen nach 28 Tagen Emission after 28 days				Retentionsbereich Retention range	Quantifizierung Quantification	Identifikation Identification	C <sub>i</sub> [µg/m <sup>3</sup> ]	SER <sub>i</sub> [µg/m <sup>2</sup> h]	Zuordnung Classification [canc./NIK/o.NIK] [carc./LCI/no LCI]	R <sub>i</sub>	Ifd. Nr Serial number	ADAM_2012_08_1	Legende legend ----- VOC = < C6 VOC = C6 - C16 SVOC = C16 - C22 ----- a = substanzspezifisch substance-specific b = substanzähnlich substance-like c = Toluoläquivalent toluene equivalent d = DNPH ----- 1 = Klasse 1 class 1 2 = Klasse 2 class 2 3 = Klasse 3 class 3
QuickStep Impressive laminate	Kommentar Comment	CAS-No.	RT [min]										
gefundene Substanzen Detected substances	Daten nur über den Button "Messergebnisse eingeben/löschen" in diese Tabelle eintragen Data to be entered only via the button "enter/delete results"												
Formaldehyd		50-00-0	4,29	VVOC	d	1	16	20,00			7-22	1	
Essigsäure		64-19-7	5,60	VOC	a	1	19	23,75	1250	0,015	9-1	1	
2-Methoxy-1-methylethylacetat		108-65-6	13,50	VOC	a	1	4	5,00	2700	0,001	10-6	1	
alpha-Pinen		80-56-8	17,20	VOC	a	1	3	3,75	1500	0,002	3-2	1	
Dipropylenglykolmono-methylether gesättigte aliphatische		34590-94-8	20,90	VOC	a	1	7	8,75	3100	0,002	6-12	1	
Kohlenwasserstoffe ab C9 bis C16			25,00	VOC	a	1	103	128,75	6000	0,017	2-10	1	

Photo of the test specimen

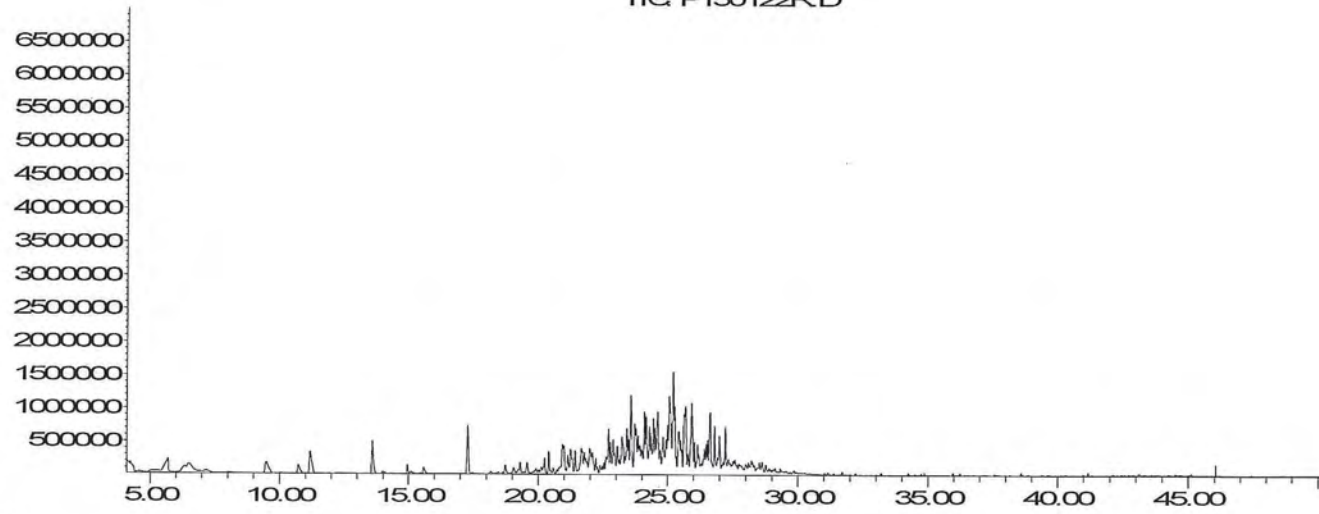




# Chromatogram after 3 days

Abundance

TIC: P150122R.D

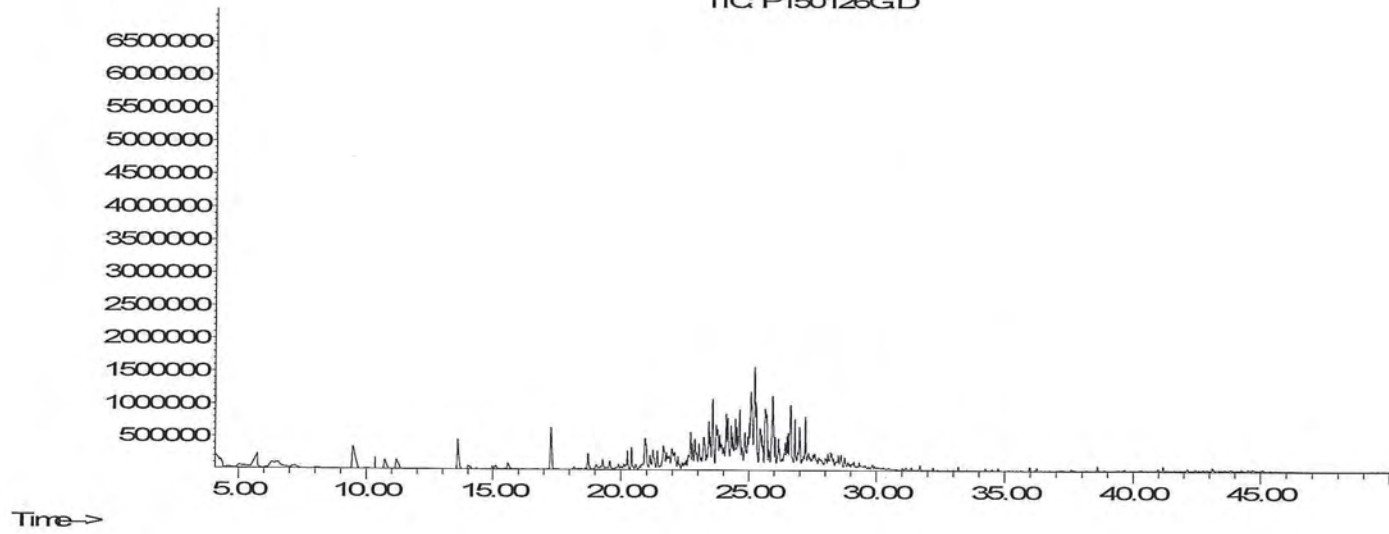


Time→

# Chromatogram after 7 days

Abundance

TIC: P150126GD

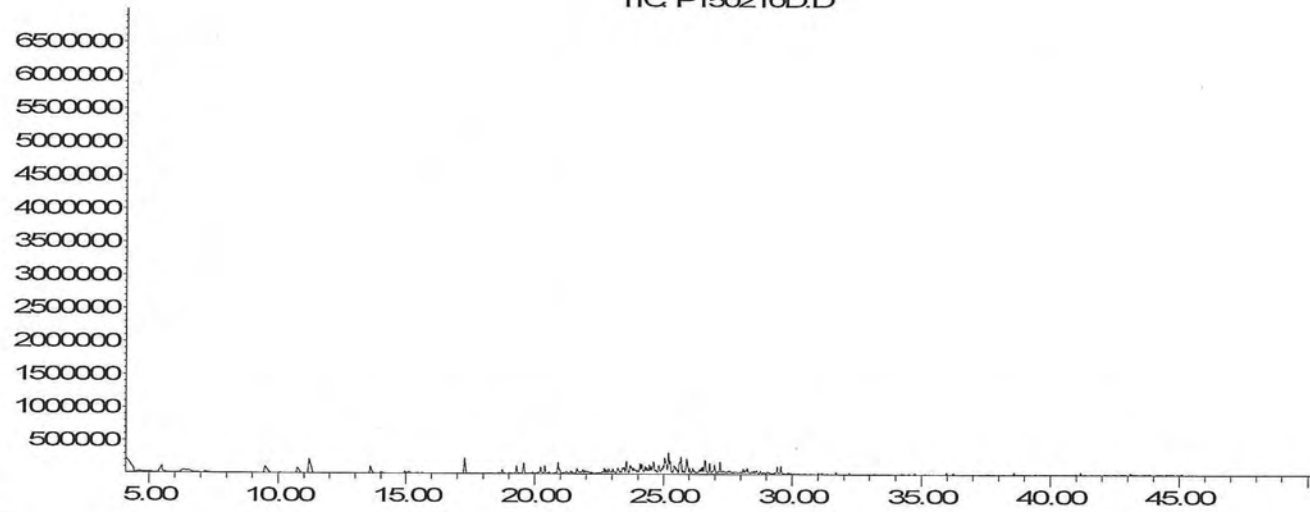




# Chromatogram after 28 days

Abundance

TIC: P150210.D



Time→