

ESIG Solvents human exposure database guidance

Oct 2022

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Database guide

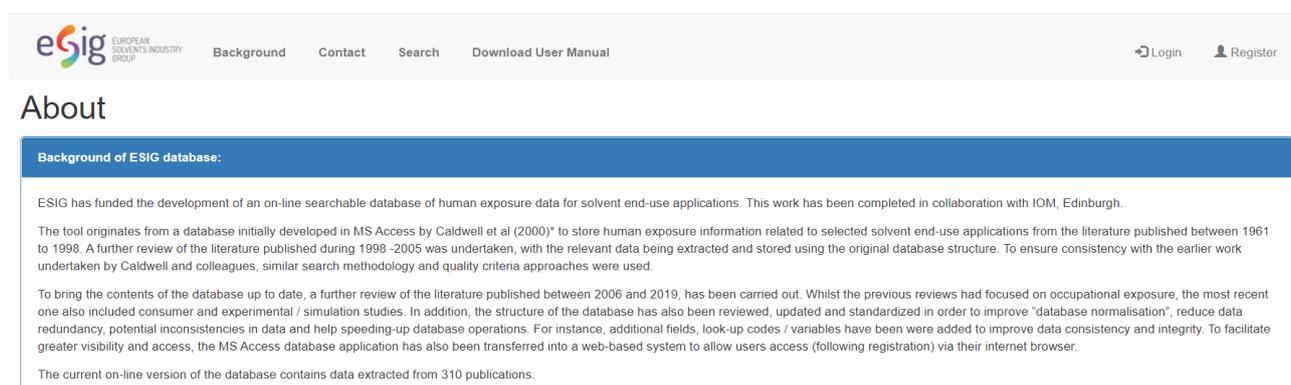
Getting Started

Open any internet explorer (Google Chrome recommended) and open new window

Type <https://esig.iom-world.co.uk/> or follow the link from the <https://www.esig.org/> website

Home Page will appear with six main tabs on the top menu:

- Background: Brief information about the ESIG database
- Contact: Contact details for general queries and technical support with the system
- Search: Page (requires user login) to search, query, view, print and export citations data.
- Download User Manual: Link to download latest user manual
- Login: Page for registered users to login.
- Register: Page for new users to register.



The screenshot shows the top navigation bar of the ESIG website with the logo and menu items: Background, Contact, Search, Download User Manual, Login, and Register. Below the navigation bar is the 'About' section, which contains the following text:

Background of ESIG database:

ESIG has funded the development of an on-line searchable database of human exposure data for solvent end-use applications. This work has been completed in collaboration with IOM, Edinburgh.

The tool originates from a database initially developed in MS Access by Caldwell et al (2000)* to store human exposure information related to selected solvent end-use applications from the literature published between 1961 to 1998. A further review of the literature published during 1998 -2005 was undertaken, with the relevant data being extracted and stored using the original database structure. To ensure consistency with the earlier work undertaken by Caldwell and colleagues, similar search methodology and quality criteria approaches were used.

To bring the contents of the database up to date, a further review of the literature published between 2006 and 2019, has been carried out. Whilst the previous reviews had focused on occupational exposure, the most recent one also included consumer and experimental / simulation studies. In addition, the structure of the database has also been reviewed, updated and standardized in order to improve "database normalisation", reduce data redundancy, potential inconsistencies in data and help speeding-up database operations. For instance, additional fields, look-up codes / variables have been added to improve data consistency and integrity. To facilitate greater visibility and access, the MS Access database application has also been transferred into a web-based system to allow users access (following registration) via their internet browser.

The current on-line version of the database contains data extracted from 310 publications.

How to Register

Click on the 'Register' tab from the top menu

Enter all the mandatory details.

Press 'Register'

Once registered successfully, you will be presented with a welcome message and you can start browsing the database.

Notes:

Your username should be same as your email address.

Your username/email should not have been registered before.

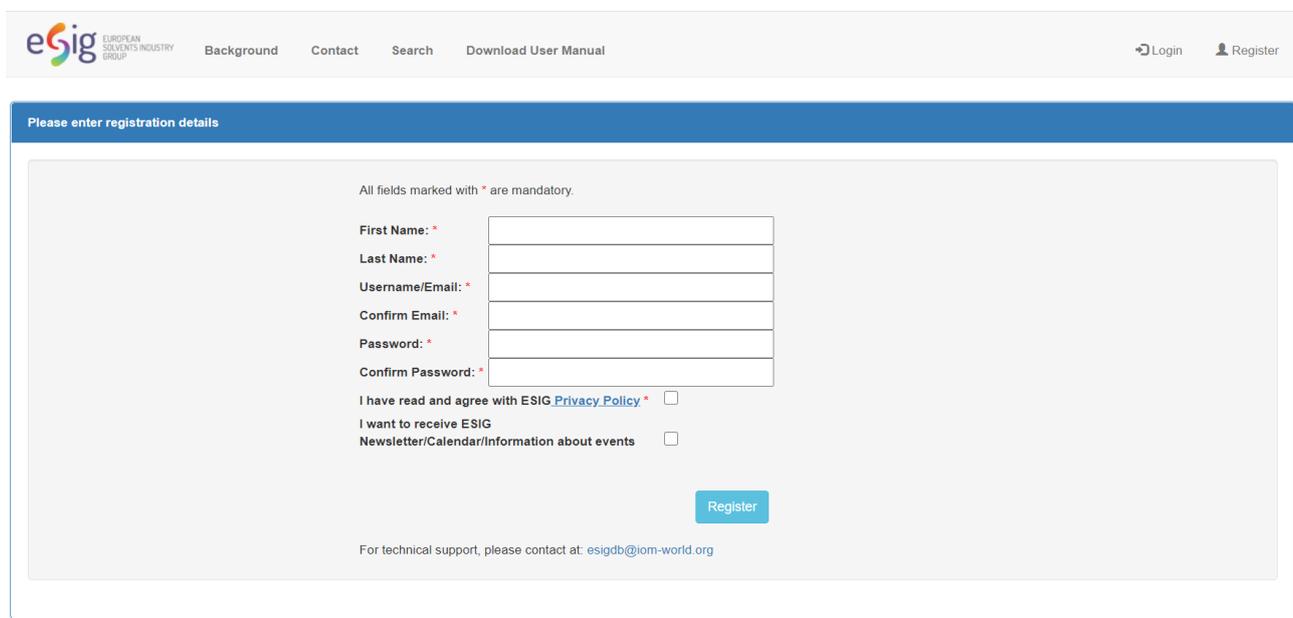
You need to enter email/username twice to confirm it.

You need to enter password twice to confirm it.

Password is case sensitive.

Your actual password is not stored in the system. It will be masked with the password hashing technique which replaces the original password text with a random string.

If you have any issues with registration then please contact the technical support details provided on the page.



The screenshot shows the ESIG registration page. At the top left is the ESIG logo (European Cement Industry Group) and navigation links: Background, Contact, Search, Download User Manual. At the top right are 'Login' and 'Register' buttons. The main content area is titled 'Please enter registration details' and contains the following fields and options:

- All fields marked with * are mandatory.
- First Name: *
- Last Name: *
- Username/Email: *
- Confirm Email: *
- Password: *
- Confirm Password: *
- I have read and agree with ESIG [Privacy Policy](#). *
- I want to receive ESIG Newsletter/Calendar/Information about events
- Register button
- For technical support, please contact at: esigdb@iom-world.org

How to Login

Click on the 'Login' tab from the top menu

Enter your credentials email/username and password.

Press 'Login'

You will be directed to search page where you can browse all the records.

Please enter your Username and Password to login

Username: *
 Password: *

Forgot your password? Please contact support at: esigdb@iom-world.org

Searching and filtering the records

Once logged in, please click on the 'Search' tab from the top menu

You will be directed to the search page with list of all the available citations and option to filter the records.

You can filter the records by following options:

- Measured Substance
- SNAP Code Overall
- SNAP Code
- Publication Year
- Study Setting
- Overall Data Quality
- Caldwell Data Quality

Select you parameters and press 'Search' button to filter the records.

Please use the search menu to view citation sample results data.

Search Filters

Please select your filter options and press 'Search'. Press 'Export' to generate Excel file of your filtered results. Press 'Clear' to remove search filters.

Measured Substance: ⓘ
 SNAP Code Overall: ⓘ
 SNAP Code: ⓘ
Press Ctrl + [Your Selection] for multiple selections
 Publication Year: From: To: ⓘ
 Study Setting: ⓘ
 Overall Data Quality: ⓘ
 Caldwell Data Quality: ⓘ

You will be presented with list of all the available records based on your search criteria, with basic details of Citation and Activity.

Press 'Clear' to remove the search/filter criteria.

Notes:

Each record/result represents an activity within a citation.

Total number of results found for search operation will be displayed on top.

Viewing the records

To view the searched/filtered records, press 'View Details' button, which is available for each individual record.

Activity: 704 Automotive spray painting

Citation ID: 323
Publication Title: Reduced exposure to organic solvents by use of water-based paint systems in car repair shops.
Publication Name: INT. ARCH. OCCUP. ENVIRON. HEALTH
Publication Year: 2004 | **Publication Volume:** 77 | **Publication Page Start:** 31 | **Publication Page End:** 38
Measured Substance: 2,6-dimethylheptan-4-one (DIBK) 108-83-8
SNAP Code/ Area: 60101 Paint application : manufacture of automobiles Automotive spray painting, dipping, curtain coating, electrostatic spraying
Study Setting:

[View Details](#)

Warning: Details page opens in new window. Please allow pop-ups if blocked. For more details, please see the 'Viewing the Records' section of user manual.

This will show Activity page with the following details:

- Citation Details
- Activity Details
- Risk Measurement Measures
- Solvent Products and Solvent Ingredients
- Samples and Sample results



[Background](#) | [Contact](#) | [Search](#) | [Download User Manual](#) | [New Citation](#) | [User Management](#)

[IOM Admin](#) | [Logout](#)

Publication Name: INT. ARCH. OCCUP. ENVIRON. HEALTH

Citation ID: 323
Publication Title: Reduced exposure to organic solvents by use of water-based paint systems in car repair shops.
Publication Year: 2004 | **Publication Volume:** 77 | **Publication Page Start:** 31 | **Publication Page End:** 38
First Author:
Authors List: Bratveit M.; Hollund B.E.; Moen B.E.;
Country: NORWAY | **Country First Author:**
Study Setting: | **Time Period:**
Language:
Study Reason: Exposure Assessment

Abstract: Objective. The objective of this study was to determine to what extent the substitution of solvent-based paint by water-based paint has reduced potential exposure to organic solvents for spray painters in car repair shops. Methods. Full-shift personal air sampling (n=79) was carried out over 3 consecutive days in eight car repair shops. Blood samples on the Monday morning (n=26) and at the end of the shift on the Wednesday (n=26), were analysed for organic solvents by headspace techniques. Results. Toluene was the organic solvent detected at the highest geometric mean concentration in air samples when solvent-based paint systems were used (0.8 ppm), whereas xylene was found at the highest level when water-based systems were used (0.25 ppm). Toluene, isopropanol, acetone and butyl acetate were detected at higher concentrations when solvent-based paint was used than when water-based paint was employed. The additive factor, based on Norwegian limit values, was three-times higher for the painters using solvent-based paint (0.15) than for those using water-based paint (0.05). On Wednesday after shift the geometric mean of toluene in blood was significantly higher for the painters using solvent-based paint (0.044 mug/ml) than for the painters using water-based paint (0.007 mug/ml). There was a significant correlation between toluene in personal air samples and toluene in blood samples taken at the end of the shift on the same day. Conclusions. When solvent-based paint systems were used the additive factor for organic solvent exposure was three-times higher than when water-based systems were employed. The exposure levels of the organic solvents were well below the Norwegian limit values. The significant correlation between the toluene concentration in air and blood samples indicated that the uptake of organic solvents was correspondingly reduced. At the levels of organic solvents presently described the risk of acute and chronic health effects caused by organic solvents is low.

Notes:
Caldwell Data Quality: Fair | **Overall Data Quality:**

[Update](#) [Print](#)

Activity: Automotive spray painting
SNAP Code/Product Area: 60101 Paint application : manufacture of automobiles
Duration Of Activity: | **Number Of Workers:** 29 | **Type Of Solvent Product Used:**
Notes:

Solvents Used:						
Solvent Product	Solvent Ingredient	Percentage Range	CAS No	Grouping Low	Grouping High	Notes
PAINT & SOLVENTS	Aromatic Naphtha 60/120		No CAS Available			

Risk Management Measures:					
Environment	Ventilation	Engineering Control	PPE	RPE	Notes
		general building ventilation (passive)			
		general building ventilation (mechanical)			
		other (free text)			Spray Booth
			respiratory protection		



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 Logout

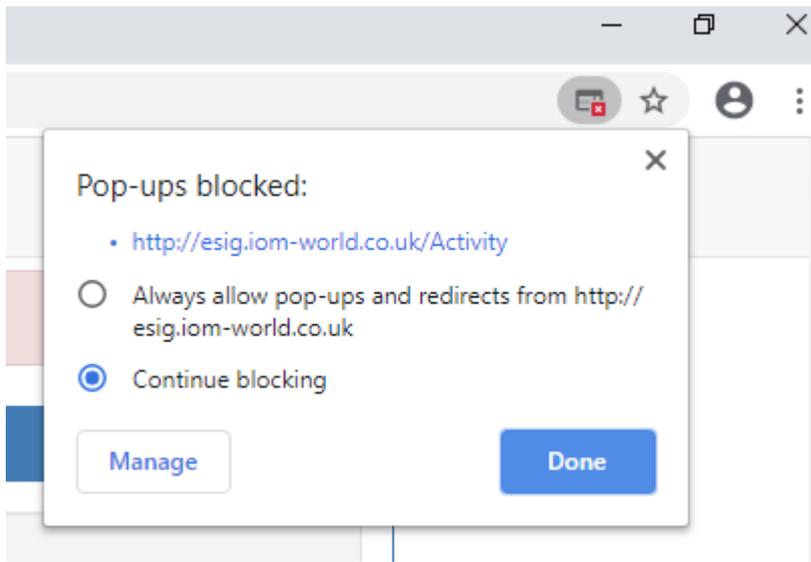
Samples ID: 2705

Sample Desc:
Strategy: Targetted
Sample Method: Pump & Tube |
Analytical Method: GC-FID |
Notes:

ID	Type	Solvent Name	Duration	TWA	Sample Year	No Of Samples	Ref Value Cited	Ref Value	Ref Unit	Authority	No Of Samples < LOD	Perc Of Samples < LOD	LOD	LOD Unit	LOQ	LOQ Unit
15057	Static	Toluene	28	<input type="checkbox"/>		6	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15058	Static	Toluene	37	<input type="checkbox"/>		6	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15059	Personal	Toluene	411	<input type="checkbox"/>		9	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15060	Personal	Toluene	419	<input type="checkbox"/>		6	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15061	Personal	Toluene	459	<input type="checkbox"/>		5	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15062	Personal	Toluene	452	<input type="checkbox"/>		15	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15063	Personal	Toluene	440	<input type="checkbox"/>		11	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						
15064	Personal	Toluene	443	<input type="checkbox"/>		3	No	25	ppm	NORWEGIAN DIRECTORATE OF LABOR INSPECTION						

Notes:

Viewing the activity details opens up a new tab/window on the browser. Depending on your security settings, this may be blocked. To enable viewing details page, please allow pop-ups from this website.



Printing the records

To print the records, please use the filtering options from the search page to filter the records.

Click on the 'View Details' button to view the citation, activity and sample results

Activity: 704 Automotive spray painting

Citation ID: 323
Publication Title: Reduced exposure to organic solvents by use of water-based paint systems in car repair shops.
Publication Name: INT. ARCH. OCCUP. ENVIRON. HEALTH
Publication Year: 2004 | **Publication Volume:** 77 | **Publication Page Start:** 31 | **Publication Page End:** 38
Measured Substance: 2,6-dimethylheptan-4-one (DIBK) 108-83-8
SNAP Code/ Area: 60101 Paint application : manufacture of automobiles Automotive spray painting, dipping, curtain coating, electrostatic spraying
Study Setting:

Warning: Details page opens in new window. Please allow pop-ups if blocked. For more details, please see the 'Viewing the Records' section of user manual.

[View Details](#)

Press the 'Print' to print the all the details in PDF format.

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Background Contact Search Download User Manual New Citation User Management

IOM Admin Logout

Publication Name: INT. ARCH. OCCUP. ENVIRON. HEALTH

Citation ID: 323
Publication Title: Reduced exposure to organic solvents by use of water-based paint systems in car repair shops.
Publication Year: 2004 | **Publication Volume:** 77 | **Publication Page Start:** 31 | **Publication Page End:** 38
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Authors List: Bratveit M.; Hollund B E.; Moen B.E.;
Country: NORWAY | **Country First Author:**
Study Setting: | **Time Period:**
Language:
Study Reason: Exposure Assessment
Abstract: Objective. The objective of this study was to determine to what extent the substitution of solvent-based paint by water-based paint has reduced potential exposure to organic solvents for spray painters in car repair shops. Methods. Full-shift personal air sampling (n=79) was carried out over 3 consecutive days in eight car repair shops. Blood samples on the Monday morning (n=26) and at the end of the shift on the Wednesday (n=26), were analysed for organic solvents by headspace techniques. Results. Toluene was the organic solvent detected at the highest geometric mean concentration in air samples when solvent-based paint systems were used (0.8 ppm), whereas xylene was found at the highest level when water-based systems were used (0.25 ppm). Toluene, isopropanol, acetone and butyl acetate were detected at higher concentrations when solvent-based paint was used than when water-based paint was employed. The additive factor, based on Norwegian limit values, was three-times higher for the painters using solvent-based paint (0.15) than for those using water-based paint (0.05). On Wednesday after shift the geometric mean of toluene in blood was significantly higher for the painters using solvent-based paint (0.044 mug/ml) than for the painters using water-based paint (0.007 mug/ml). There was a significant correlation between toluene in personal air samples and toluene in blood samples taken at the end of the shift on the same day. Conclusions. When solvent-based paint systems were used the additive factor for organic solvent exposure was three-times higher than when water-based systems were employed. The exposure levels of the organic solvents were well below the Norwegian limit values. The significant correlation between the toluene concentration in air and blood samples indicated that the uptake of organic solvents was correspondingly reduced. At the levels of organic solvents presently described the risk of acute and chronic health effects caused by organic solvents is low.
Notes:
Caldwell Data Quality: Fair | **Overall Data Quality:**

Activity: Automotive spray painting
SNAP Code/Product Area: 60101 Paint application : manufacture of automobiles
Duration Of Activity: | **Number Of Workers:** 29 | **Type Of Solvent Product Used:**
Notes:

[Update](#) [Print](#)

This will create a PDF document in your downloads folder (depending on your browser)

Exporting the records

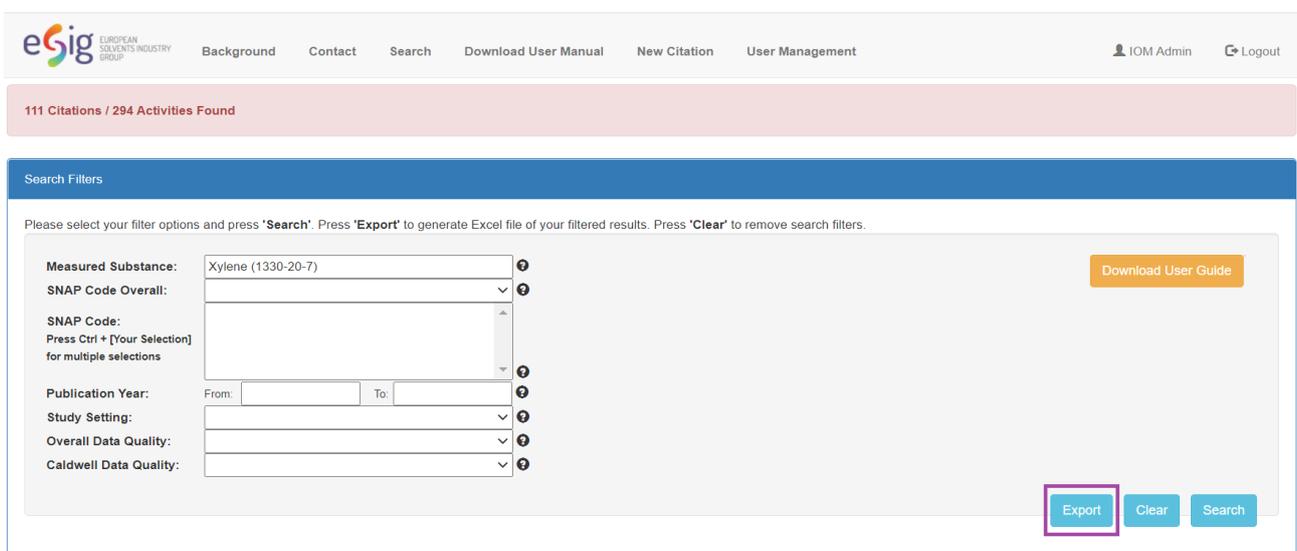
To export the data in Excel format, please go to the search page to filter the records.

You can filter the records by following options:

- Measured Substance
- SNAP Code Overall
- SNAP Code
- Publication Year
- Study Setting
- Overall Data Quality
- Caldwell Data Quality

Select your parameters and press 'Search'.

Click on the 'Export' button to export the searched/filtered results in Excel format.

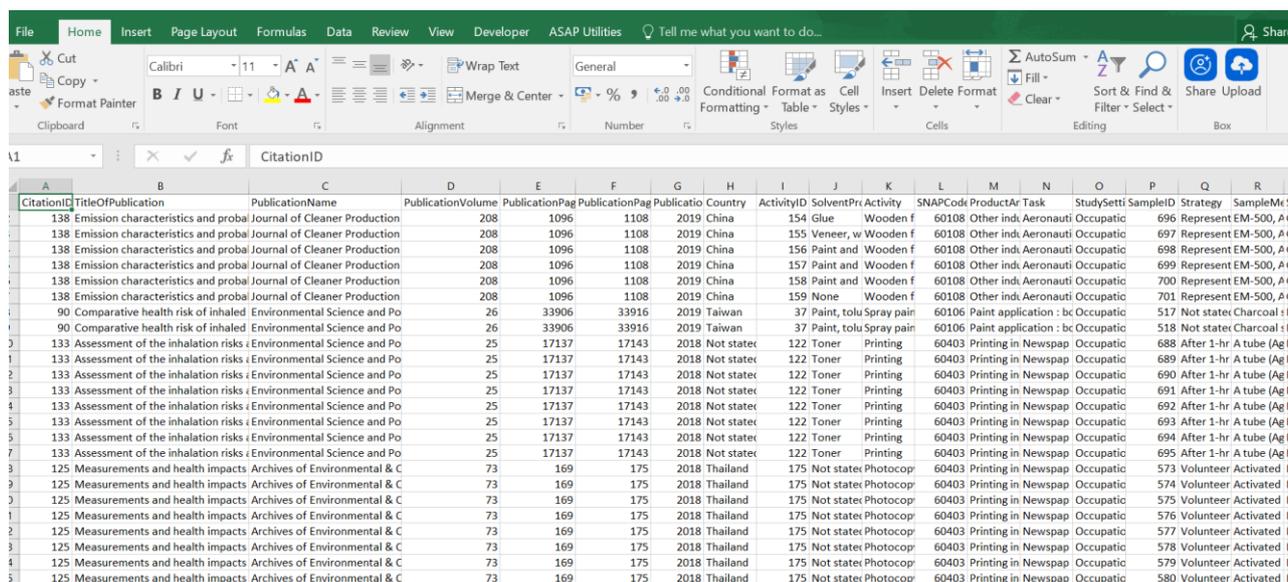


The screenshot shows the 'esig' search interface. At the top, there is a navigation bar with links for 'Background', 'Contact', 'Search', 'Download User Manual', 'New Citation', and 'User Management'. On the right, there are links for 'IOM Admin' and 'Logout'. Below the navigation bar, a status bar indicates '111 Citations / 294 Activities Found'. The main section is titled 'Search Filters' and contains the following fields:

- Measured Substance:** Xylene (1330-20-7)
- SNAP Code Overall:** (dropdown menu)
- SNAP Code:** (dropdown menu with a note: 'Press Ctrl + [Your Selection] for multiple selections')
- Publication Year:** From: (input field) To: (input field)
- Study Setting:** (dropdown menu)
- Overall Data Quality:** (dropdown menu)
- Caldwell Data Quality:** (dropdown menu)

At the bottom right of the search filters section, there are three buttons: 'Export' (highlighted with a red box), 'Clear', and 'Search'. A 'Download User Guide' button is also visible in the top right corner of the search filters area.

This will create an Excel document in your downloads folder (depending on your browser) with date/time stamp.



CitationID	TitleOfPublication	PublicationName	PublicationVolume	PublicationPageStart	PublicationPageEnd	PublicationYear	Country	ActivityID	SolventProduct	Activity	SNAPCode	ProductArea	Task	StudySetting	SampleID	Strategy	SampleMethod
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	154	Glue	Wooden f	60108	Other ind	Aeronauti	Occupatic	696	Represent EM-500, A	
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	155	Veneer, w	Wooden f	60108	Other ind	Aeronauti	Occupatic	697	Represent EM-500, A	
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	156	Paint and	Wooden f	60108	Other ind	Aeronauti	Occupatic	698	Represent EM-500, A	
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	157	Paint and	Wooden f	60108	Other ind	Aeronauti	Occupatic	699	Represent EM-500, A	
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	158	Paint and	Wooden f	60108	Other ind	Aeronauti	Occupatic	700	Represent EM-500, A	
138	Emission characteristics and probal	Journal of Cleaner Production	208	1096	1108	2019	China	159	None	Wooden f	60108	Other ind	Aeronauti	Occupatic	701	Represent EM-500, A	
90	Comparative health risk of inhaled	Environmental Science and Po	26	33906	33916	2019	Taiwan	37	Paint, tolu	Spray pain	60106	Paint applica	tion : bc	Occupatic	517	Not state	Charcoal f
90	Comparative health risk of inhaled	Environmental Science and Po	26	33906	33916	2019	Taiwan	37	Paint, tolu	Spray pain	60106	Paint applica	tion : bc	Occupatic	518	Not state	Charcoal f
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	688	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	689	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	690	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	691	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	692	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	693	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	694	After 1-hr	A tube (Ag	
133	Assessment of the inhalation risks	Environmental Science and Po	25	17137	17143	2018	Not state	122	Toner	Printing	60403	Printing in Newspaper	Occupatic	695	After 1-hr	A tube (Ag	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	573	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	574	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	575	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	576	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	577	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	578	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	579	Volunteer	Activated I	
125	Measurements and health impacts	Archives of Environmental & C	73	169	175	2018	Thailand	175	Not state	Photocop	60403	Printing in Newspaper	Occupatic	580	Volunteer	Activated I	

Excel file column headings

The downloaded Excel file contains a number of columns. To aid interpretation of the downloaded information, a list of the data contained within each of the columns is detailed below.

Excel output heading	Description
CitationID	Unique citation identification number
TitleOfPublication	Title of publication
PublicationName	Name of journal
PublicationVolume	Volume of journal
PublicationPageStart	First page of range of pages article found on
PublicationPageEnd	Last page of range of pages article found on
PublicationYear	Date of publication issue
Country	Country where study was performed (if explicitly stated)
ActivityID	Unique ID number
SolventProduct	Solvent product used
Activity	Description of activity
SNAPCode	SNAP code linked to activity
ProductArea	SNAP code text
Task	Task
StudySetting	Overview of study setting, e.g. occupational, consumer, laboratory /simulation
SampleID	Unique ID number
Strategy	Sample strategy (e.g. worse case, targeted, random)
SampleMethod	Sample collection method (active, passive, direct reading, etc.)
SampleMethodRef	Reference to standard sampling method used (NIOSH, OSHA, MDHS etc.)
AnalyticalMethod	Analytical method used (GC-MS, ICP-AS)

Excel output heading	Description
AnalyticalMethodRef	Reference to standard sampling method used (NIOSH, OSHA, MDHS etc.)
Type	Sample type (personal, area)
SampleResultID	Unique ID number
SolventID	Unique ID number
MeasuredSubstance	Measured substance
CAS number	CAS number
Solvent grouping (low level)	More refined category for the oxygenated or hydrocarbon grouping
Solvent grouping (high level)	Broad solvent category - oxygenated or hydrocarbon
Duration	Sample collection period in minutes
TWA	Have the results been time weighted averaged
Single	Single sample result concentration
NoSamples	Number of samples if result is not a single measurement
AM	Arithmetic mean
GM	Geometric mean
Median	Median
StdDev	Standard deviation if result is mean
GSD	Geometric standard deviation if result is GM
Min	Minimum of range (if not a single measurement)
Max	Maximum of range (if not a single measurement)
Unit	Unit of measurement
Percentile25	25th Percentile
Percentile75	75th Percentile
Percentile90	90th Percentile
ReferenceValue	Countries reference limit value
RefUnit	Unit of measurement
Authority	Name of organisation who assigned reference value, e.g. HSE, ACGIH etc
SampleYear	Year sample taken
LimitOfDetection	Limit of detection
LODUnit	Unit of measurement
LimitOfQuantification	Limit of quantification
LOQUnit	Unit of measurement
OverallDataQuality	Overall data quality assessment - Good, Fair, Poor
CaldwellDataQuality	Caldwell Data Quality - Good, Fair, Poor

IOM's purpose is to improve people's health and safety at work, at home and in the environment through excellent independent science:

- Research
- Occupational Hygiene
- Laboratory Services
- Nanotechnology Safety
- Training Services
- Consultancy

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Chesterfield S41 0TZ
Tel: 01246 383 110

IOM Stafford

Brookside Business Park,
Cold Meece, Stone,
Staffordshire, ST15 0RZ
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