IMT Atlantique
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Improving Indoor Air Quality Knowledge Base

Through the development of pollutant-activity-specific matrix.

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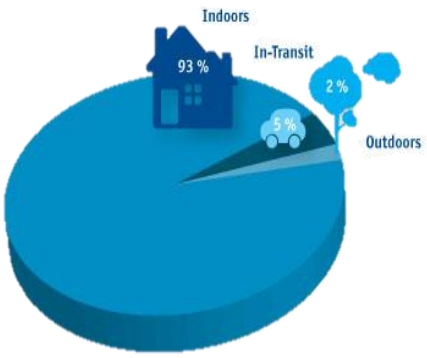
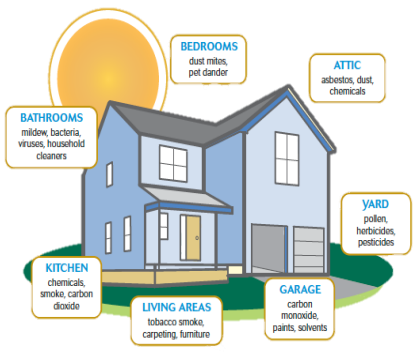


Average Daily Air breath by Humans
Source : Tarkett Sports

Introduction and Objectives

Importance of Indoor Air Quality in human life

- **Problematic** – 4.3 million people die each year from the exposure to household air pollution according to the World's Health Organization (WHO).
- **Response** – Aiming to link indoor air pollutant and its sources to develop reactions and minimize health effects.
- **Definition** – Air quality within and around buildings and structures (Environmental Protection Agency, 2017).
- **Scaling up** – Study took place at indoor environments with high frequency of people and various activity performing that can be extrapolated.
- **Analyze and Detection** – Pollutant identification is a key component of the general policy for risk assessment and site management.
- **Objectives:**
  - **Identification** of activities, products and materials, sources, emitted in indoor atmospheres.
  - **Creation and Development** of a matrix



Example of Indoor Pollutants
Source : Air Commander 1

Methodology

Step by Step

- **Bibliographic research** of previous studies and pollutant **classification related to the source.**
- **Source identification** and placement of activities and materials in **matrix structure**.
- **Place selection**, being a classroom in **IMT** and restaurant **SODEXO** according to criteria of **amount of people**, **frequency** and **activity**.
- **Analysis** of the sites, two team displacement for **randomness** of measurements and **identification of pollutants**.
- **Connection** of compounds recognized in field study and scientific papers related to our case of study.
- Final **Matrix Creation**, with pollutant **ranking** according to the potential presence in the material and the potential quantity .

Results

Indoor Pollutant Matrix - Example

			Cafeteria	Construction Materials				
1st Family		Pollutant	CAS Number [1]	Cement	Paint	Plaster	Metallic ceiling	Wood
	4	Benzene	71-43-2		3[15][33]			3[7]
	4	Naphthalene	91-20-3		3[15][33]			
	4	n-Hexane	110-54-3		3[14]			3[12]
	4	Toluene	108-88-3		5[7][10][11]		1[46][47]	5[7][10][12]
	4	Total Petroleum Hydrocarbons	CASID30651		4[10][11]			
	4	Xylenes	1330-20-7		5[10][11][15]		1[46][47]	5[7][10][12]
	5	Arsenic	7440-38-2					3[19]
	5	Chromium	7440-47-3					3[19]
	5	Cobalt	7440-48-4				1[46][47]	
	5	Copper	7440-50-8					3[19]
	5	Lead	7439-92-1		3[13]			3[13]
	5	Silica	7631-86-9			1[20]	1[46][47]	
	5	Zinc	7440-66-6		3		1[46][47]	
	7	Pentachlorophenol	87-86-5					4[17]
	9	Methylene Chloride	75-09-2		4[7]		1[46][47]	
	10	Cresols	1319-77-3					5[22]
	10	Creosote	8021-39-4					5[17][18]
	10	Phenol	108-95-2					4[17]
	13	Acetone	67-64-1		4[9][10][11]		3[46][47]	4[10][12]
	13	Carbon Tetrachloride	56-23-5		4[7]			
	13	Formaldehyde	50-00-0		4[5]		3[46][47]	4[7]
	13	Styrene	100-42-5				1[46][47]	
	16	Methyl Alcohol	67-56-1		3[10]			3[10]
	16	ethylene glycol	107-21-1		3[10]			3[10]
	16	propylene glycol	57-55-6		3[10]			3[10]
	16	Ethanol	64-17-5		3[10]			3[10]
	16	Isopropanol	67-63-0		3		1[46][47]	
	16	Isopropyl alcohol					1[46][47]	
	17	Calcium Carbonate	471-34-1			2[20]	2[46][47]	
	17	Calcium Hidroxide	1305-62-0	4[5][21]		4[5][20]	2[46][47]	
	17	Calcium Sulfate	7778-18-9			2[20]	2[46][47]	
	17	Magnesium oxide	1309-48-4			2[20]	2[46][47]	
	17	Aluminum oxide		4[5][21]		4[5][20]		
	17	Calcium oxide		4[5][21]		4[5][20]		
	17	Silicon dioxide		4[5][21]				
	17	Iron Oxide		4[5][21]		4[5][20]	2	
	18	Carbon Dioxide	124-38-9			2[20]		
	18	Benzo(a)pyrene	50-32-8					4[16]
	18	Esters			3[10]			3[10]

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