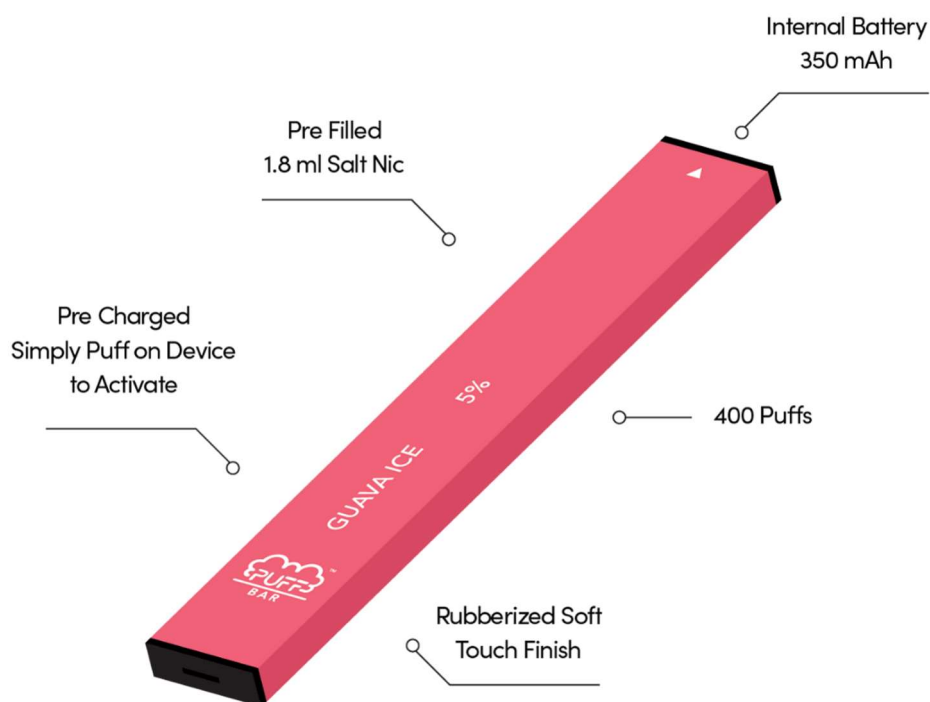




Arbeitsgemeinschaft  
Tabakprävention Schweiz

Association suisse pour  
la prévention du tabagisme

Associazione svizzera per  
la prevenzione del tabagismo



# Puff Bar and other Disposable ENDS

## Fact Sheet

### Fifth-Generation Disposable E-Cigarettes

Puff Bar is the brand name of a new product that first appeared on the Swiss market in 2020 and has led to hundreds of copycat brands. They are disposable ENDS, coming in a wide variety of flavours. They are cheap, easily available, and increasingly popular among youth. They raise new concerns in regards of safety, health consequences, addiction, and environmental impact.

## What is a Puff Bar?

Electronic Nicotine Delivery Systems (ENDS), more commonly known as e-cigarettes, appeared on the market around 2008-2009. ENDS devices developed into mostly bulky box-mods, or tanks, composed of a large battery, a heating coil, and a refillable container for the e-liquids. These were followed by pod systems, the best known of which was JUUL. JUUL appeared on the Swiss and European markets around the end of 2018 but disappeared from all European markets in December 2020 due to commercial reasons. Other pod systems are still marketed. The kind of ENDS available and their market are changing very rapidly.<sup>1</sup>

In 2019, the Puff Bar, a new disposable ENDS, was launched in the US and appeared in Switzerland in 2020. Today, various disposable ENDS brands are commercialised worldwide, with an increasing number of these single-use ENDS entering Swiss markets every week. Like other ENDS, the Puff Bar and similar disposable ENDS devices heat up the containing e-liquid to create aerosols. They resemble sleek USB flash drives small enough to fit in your pocket, allowing for stealth consumption among youth. Unlike the JUUL, Puff Bar-like devices are pre-charged and pre-filled, and once the vapour runs out, they cannot be recharged or refilled, thus making them single-use devices.<sup>2</sup> In this fact sheet, Puff Bar will be used to refer to all fifth-generation disposable ENDS.



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## Aromas & Flavours



The Puff Bar comes in various colours and varieties packaged in brightly coloured containers to reflect the wide choice of fruity flavours such as Apple Pear, Blue Razz, Grape, or Mango Peach. A study by Ramamurthi et al. (2022) identified 139 flavours of the Puff Bar and its copycats. Fruit flavours predominated, comprising 82.2% of the flavour varieties, with a prevalent flavour category combining fruit with menthol/mint (Ice) offered in 33 varieties such as Lychee Ice, Lush Ice, and Banana Ice.<sup>3</sup> A recent publication shows that “cool” and “ice” flavours contain synthetic cooling agents, which results in consumers being able to consume more and expose themselves to levels that exceed safety thresholds.<sup>4</sup> Similar to the way tobacco companies have long marketed flavoured products to appeal to youth, the Puff Bar emphasizes flavours with brightly coloured packaging and the use of descriptive names that are tailor-made to ensnare children and teens. New flavours are constantly added to the selection pool and in Switzerland in 2021, whiskey and other alcoholic cocktail flavours started to appear among retailers.



## Puff-Puff-Puff and Nicotine Hyperventilation

A new study suggests that young adults find it difficult to understand nicotine concentration, with products displaying varying nicotine levels as either mg/ml, or in percentages.<sup>5</sup> Different retailers also state conflicting information for the same product, with one stating that each classic Puff Bar “contains 20 mg of nicotine, which translates to roughly 10 cigarettes a day for former smokers”, while another states that the Puff Bar “boasts about 300 puffs in each – approximately the same as 20 cigarettes per pack.”<sup>6 7</sup> Another retailer suggests that “Puff Bars last approximately 200+ puffs per pod, approximately equivalent to 20 cigarettes”.<sup>8</sup> The unstandardised comparison of puffs to cigarettes, or of nicotine levels, thus plays a role in exposing consumers, particularly youth, to much higher levels of nicotine than they are aware of, spurring the development of addiction. Furthermore, the ever-stronger Puff Bar entering the market draws parallels to the nicotine arms race started by JUUL and is a further cause for concern as consumers easily and continuously switch to the more powerful Puff Bar.<sup>9</sup>

Using an average of stated puffs to cigarettes from retailers, Table 1 (below) of Puff Bar brands found to be available in Switzerland illustrate not only the growing variety entering the market, but also the ability of Puff Bar products to deliver very high quantities of nicotine.

**Table 1. A sample of disposable ENDS on the Swiss market on 18.02.2022**

<b>Brand</b>	<b>Puffs</b>	<b>Equal to # of cigarettes</b>	<b>CHF</b>
Bang XXL	2,000	150	20.-
Drag Bar 600	600	45	12.90
Elf Bar	600	45	8.50
Elf Bar 2500 20 mg	2,500	187.5	19.90
Frunk Bar	800	60	8.90
Geek Bar	575	43.125	11.90
Geek Bar Lite	400	30	7.50
Geek Bar Pro	1,500	112.5	13.90
Geek Bar X4000	4,000	300	New
Happy Puff Disposable	400	30	10.-
Happy Puff Drinks 2% 16 ml	4,500–5,500	338–413	35.-
Happy Puff XL 2%	1,000	75	20.-
Mynus Disposable 20 mg	150	11.25	5.-
Pacha Mama Einweg	600	45	11.90
Power Bar 600	600	45	12.90
Puff Bar	400	30	8.-
Puff Flow	1,800	135	New
Puff Plus	800	60	9.90
Puffmi by Vaporesso	500	37.5	8.50
SMOK Disposable Mbar 2%	300	22.5	9.90
ULTD Puff Bar XL 20 mg	550	41.25	12.-
Vaal Bar	500	37.5	9.90
Vaal Bar 1800 17 mg	1,800	135	17.90
Vapeman Solo Bar Disposable 20 mg	1,500	112.5	12.90

The Puff Bar is widely promoted by consumers themselves, mostly teenagers or very young adults. YouTube videos circulate of so-called “Puff Bar challenges” in which young kids film themselves taking as many puffs as possible until they fall unconscious to the ground.<sup>10</sup> Even though such hyperventilation is unlikely to be the most common way the Puff Bar is consumed, these videos nevertheless highlight how very high quantities of nicotine may be absorbed in a very short period of time.



Teenage YouTuber films himself taking as many puffs as possible within one minute.

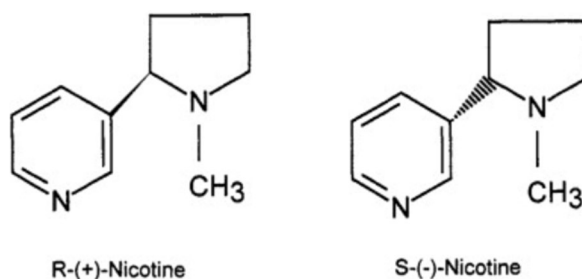
## From Nicotine Salts to Synthetic Nicotine

Nicotine salt technology was first introduced by JUUL in 2015.<sup>11</sup> Nicotine salts were also adopted by the first Puff Bar put on the market, and it seems that they have recently switched to synthetic nicotine. Nicotine can occur in the form of two stereoisomers (or optical isomers), S-nicotine, and R-nicotine. Tobacco leaves contain more than 99% S-nicotine, thus being the “natural” form of nicotine. Synthetic nicotine is chemically produced, resulting in a 50/50 ratio of S-nicotine and R-nicotine.<sup>12</sup>



## Stereochemistry of nicotine

The nicotine molecule contains a chirogenic center at the 2'-position of the pyrrolidine moiety. Thus, nicotine exists as two enantiomers: R- and S-nicotine.



R-Nicotine and S-Nicotine as shown by Jordt (2021)<sup>12</sup>

The Puff Bar is advertised as using such “tobacco-free nicotine.” Various brands claim that, due to their synthetic nicotine, their products are “cleaner,” “purer,” “tastier,” and have “higher quality,” compared to other e-cigarette products made with tobacco-derived nicotine. This raises concern, since the tobacco-free nicotine claim may cause young adults to expect the products to be harmless, with no thought of development of nicotine addiction.<sup>13</sup> Moreover, Puff Bar combines tobacco-free nicotine into a nicotine salt formula that allows for higher levels and efficiency in the delivery of nicotine compared to earlier generations of e-cigarettes.<sup>14</sup> Research has also pointed out that different e-liquids contain varying ratios of R-nicotine and S-nicotine, thus exposing users to higher levels of R-nicotine, or lower levels of S-nicotine than they are used to. Currently, the exact physiological mechanisms of varying R-nicotine and S-nicotine ratios, as well as nicotine salts, are not well studied, further raising public health concern over the long-term health risks of consumption.<sup>12</sup>

Today, among the hundreds of disposable ENDS brands available on the market, it is very difficult to know exactly which are using synthetic nicotine, as this is not declared on the product itself.

## Social Media Marketing and Influencers

The cheap and accessible nature of the Puff Bar highlights the ease with which children and teens can purchase them. Online markets particularly allow easy entry of these newer products and facilitate rapid consumer migration to recently released e-cigarette products, as consumers can easily switch to other products in a very short period of time.<sup>15 16</sup> In Switzerland, numerous online retailers sell the Puff Bar. As of February 2022, the Puff Bar brand published an online web shop with a Swiss domain. In their shop they sell Puff Bar XXL's (1,600 puffs) for CHF 9.90.<sup>17</sup> The fact that the Puff Bar is a single-use product available at a relatively low cost per unit allows for easy product switching.<sup>18</sup> In Switzerland, copycats provide a range of sizes, from 150 to 5,500 puffs for the largest Puff Bar (see Table 1)<sup>19</sup> and prices from CHF 5.- to CHF 20.-.

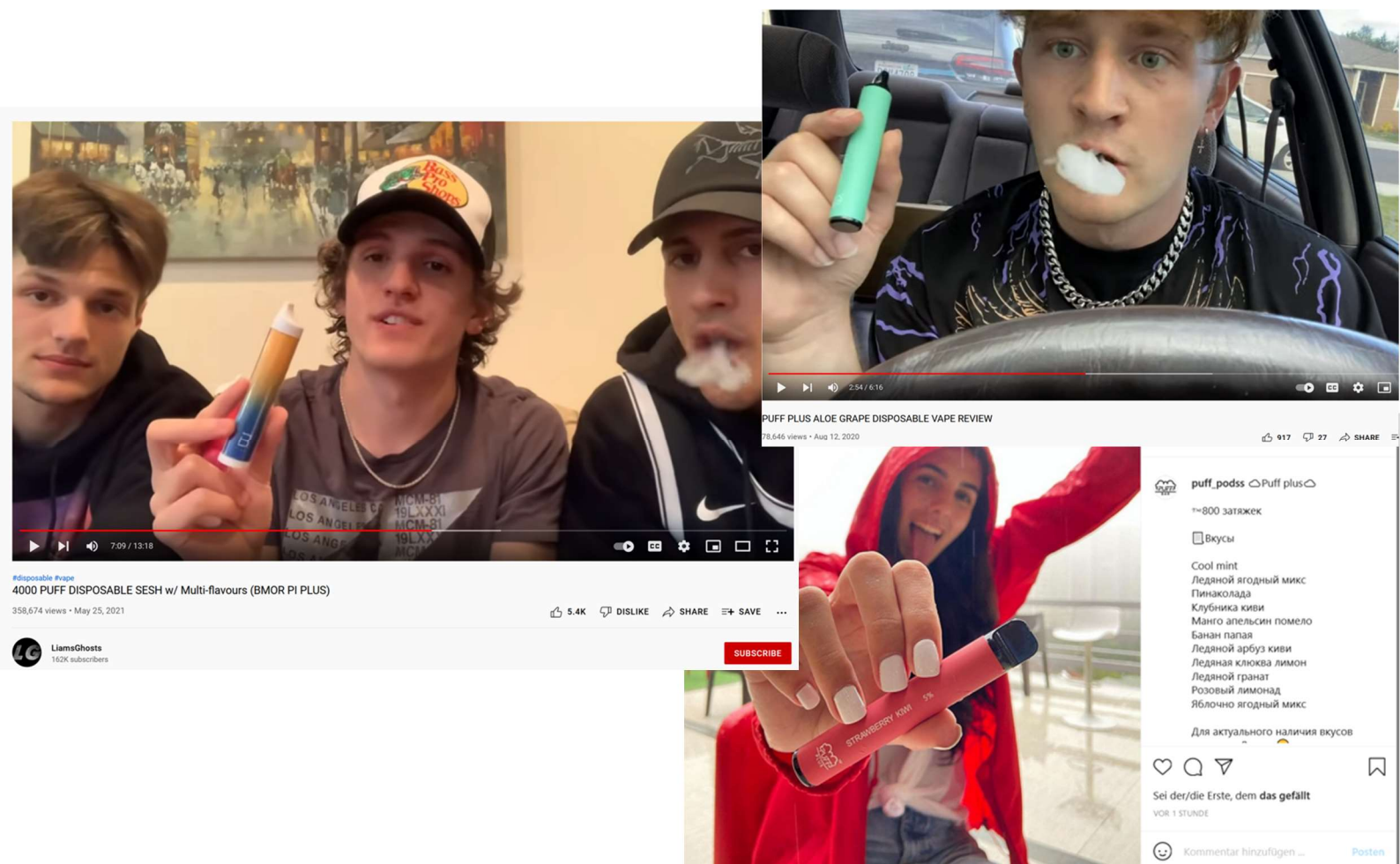


Range of Geek

Due to the recent and fast-moving release of the Puff Bar, surveillance data on consumption rates is limited. However, a study by Dai and Hao (2020) used Google Trends data to report a surge of online searches for the Puff Bar beginning in 2019, surpassing Juul in early February 2020. The surge in online Puff Bar searches suggests that these disposable e-cigarettes are gaining in popularity and have started to replace JUUL and other pod style e-cigarette products in a very short period.<sup>20</sup> Previous studies have shown that Google Search data can be effective in predicting influenza detection, identifying online sales of marijuana, and e-cigarette use, thus this study is detecting and monitoring the rapidly changing landscape of e-cigarette consumption.<sup>20</sup> A search of the hashtag #puffbar on Instagram, for example, yielded more than 79,100 entries, further showing that interest is present. Truth Initiative confirms the success of Puff Bar, stating that by April 2021, Puff Bar held more than half (51.3%) of the disposable e-



cigarette market share in the USA.<sup>2</sup> Various Swiss-based Instagram profiles have begun to appear as well, many of which promote Puff Bar sales.<sup>i</sup> On YouTube, numerous channels of youth reviewing different Puff Bar products, particularly new more impressive ones, have become increasingly popular. Puff Bar was present on Tik Tok as well, with Puff Bar videos of young adults having been viewed 137 million times, until Puff Bar-related content was removed in the past year.<sup>21</sup>



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- <sup>i</sup> - With Puff Bar logo : puffbarriviera\_lavaux, puff.riviera18, puffbar\_lausanne, puff\_lsn, lausannepuffbars  
 - With other images : puffbar\_bulle\_, puffbarmartigny, puffbarsuisse, [puffloz.ch](https://puffloz.ch), smokepuff.loz, thenotoriouspuffbarlausanne, puff\_puff\_pass\_shop, puffyverdon  
 -Without Puff Bar images : vente\_puff\_vaud, puffbar\_vaud

## Environmental Impact

Puff Bar products are marketed and advertised with an emphasis on their disposability, however they provide only minimal disposal instructions, and they are more often than not disposed of incorrectly. Single-use, disposable e-cigarettes like the Puff Bar pose the biggest threat to the environment because, as the name suggests, they are used only once, and then discarded with their plastic exterior and lithium-ion battery made of lithium, cobalt, and nickel. In addition to their batteries and plastics, they typically contain metal coils and harmful chemicals. Heavy metals like lead, as well as nicotine, can leak out and pose a biohazard risk. In consideration of the major raw materials required to make the Puff Bar, the production chain has a destructive impact on ecosystems and communities, as the raw materials needed are acquired through unsustainable mining.<sup>22</sup>



Like Juuls, Puff Bar products are often disposed of incorrectly.

## Puff Bar Regulation in the EU and Switzerland

Article 20 of the Tobacco Products Directive (2014/40/EU) lays down rules for electronic cigarettes sold as consumer products in the EU. The Directive sets various safety and quality requirements for e-cigarettes, such as a maximum nicotine concentration and volume for liquids. Moreover, mandatory health warnings must advise consumers that the products contain nicotine and should not be used by non-smokers. Packaging must also include a leaflet with instructions for use, a list of ingredients contained in the product, information on the product's nicotine content, toxicity, and adverse effects, and additional risks to certain groups. Promotional elements are not allowed.

In April 2018, a ban on sales of e-cigarettes with nicotine was overturned by the Swiss Federal Administrative Court. No other federal rules have been implemented to prevent harm from e-cigarette use. So far, all ENDS can be purchased legally by minors in Switzerland. Only a few cantons adopted a sales ban. The new Federal Act on Tobacco Products, adopted by the Swiss Parliament on Oct. 1, 2021, will ban the sale of all tobacco and nicotine products to minors nationwide, but it will enter into force only in mid-2023.<sup>23</sup> At the moment, until the new Federal Act enters into force, all ENDS are considered food products and can be sold in Switzerland if they are legally sold in any EU country and as long as they respect EU technical standards.<sup>ii</sup> Therefore, in accordance with European directives, the amount of nicotine contained in e-liquids is limited to 20 mg/ml (or 2%).<sup>24</sup>

Worryingly, products exceeding these limits are currently circulating in both Switzerland and the EU, in particular Puff Bar products clearly labelled at 50 mg/ml (or 5%) of nicotine content on an EU web page (<https://puffbar.eu>), below left, and on a Swiss web page (<https://puffplus.ch/>) below right, where products even labelled at 60 mg/ml (6%) are available (pages last checked on 16.02.2022).<sup>25</sup> Puff Bars at 50 mg/ml are usually sold on the US market.<sup>3</sup> These products are thus being sold illegally. As there is an absence of proper surveillance of these products, even when the products are labelled at 20 mg/ml, we suspect some to have concentrations higher than legally allowed. Although we observe a strong increase of Puff Bar availability on the internet and in shops, Switzerland has no data on the quantity of the products currently being sold. Moreover, any prevalence data, especially among youth, is non-existent, as the arrival of these products on the market is still relatively recent. The only surveillance data that provide some hints of ENDS use among Swiss teenagers is based on surveys conducted before the arrival of the JUUL or the Puff Bar.

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<sup>ii</sup> <https://www.blv.admin.ch/blv/fr/home/gebrauchsgegenstaende/e-zigaretten.html>



Screenshots of Puff Bars with 5% nicotine sold online on EU and Swiss shops



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