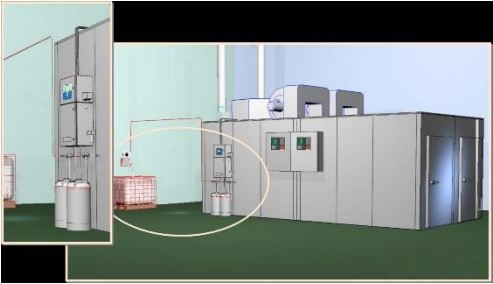
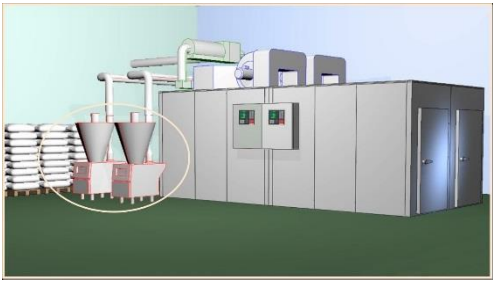




## CleanSmoke vs. Combustion Smoke

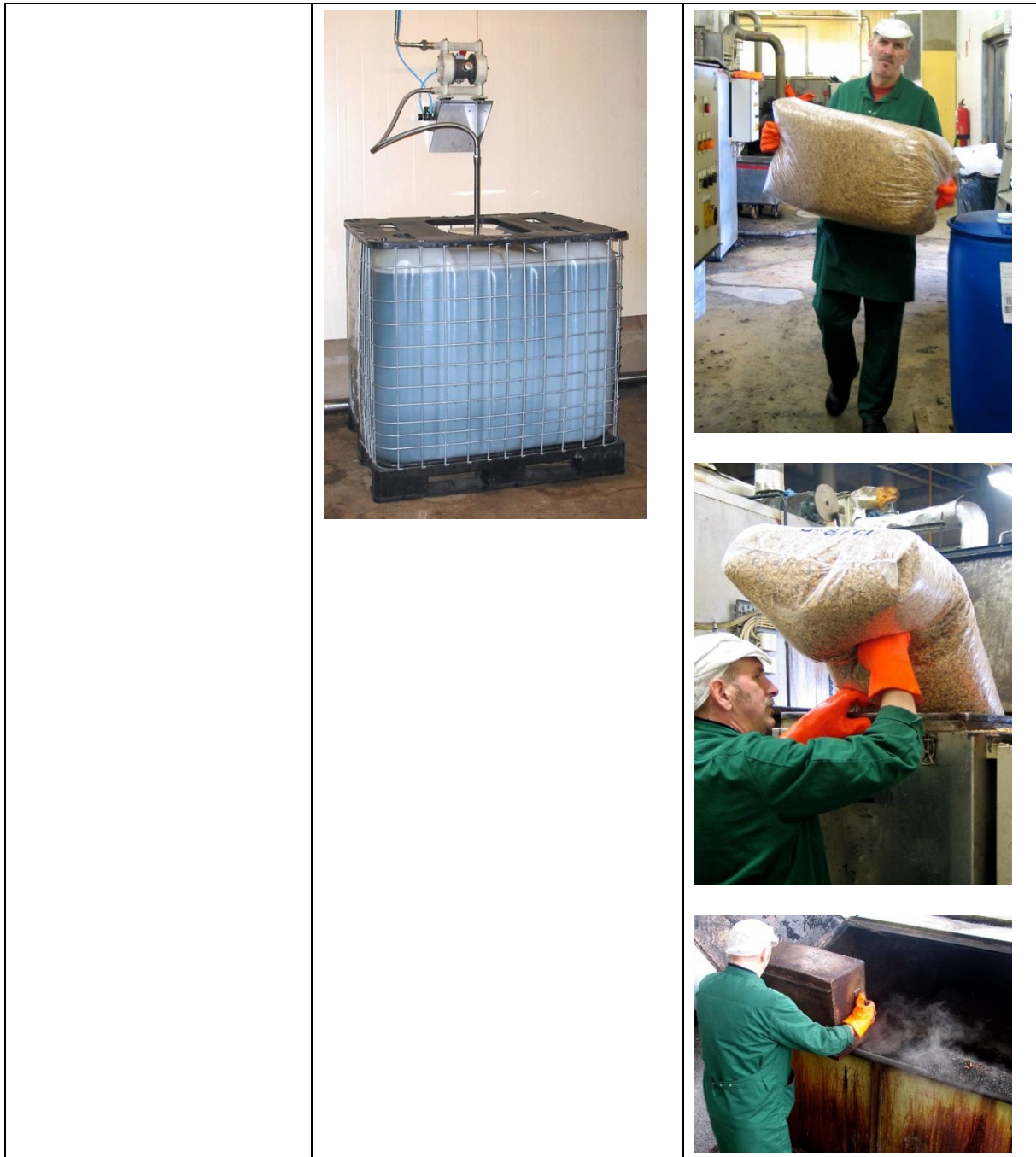
CleanSmoke	Combustion Smoke	
Purified smoke generated on the basis of purified primary products (smoke condensates)	Smoke generated from sawdust or woodchip. Sawdust or woodchips of different particle size and different moisture content are ignited by a heating wire and under supply of air smouldered.	
<i>Installation examples</i>		
<p>CleanSmoke</p> 	<p>Combustion Smoke</p> 	
<b>Facts</b>		
	<b>CleanSmoke</b>	<b>Combustion Smoke</b>
<i>Temperature</i>	ambient temperature	500-800°C
<i>Smoking times</i>	short	short
<i>Smoke taste and colour</i>	adjustable as per request	Strong till unpleasantly
Limitation for application	none	none
Handling and work safety	No heavy lifting necessary, clean work environment, no tar and no ashes	Working with: combustions gases, wood dust and wood chips, tar and ash, heavy lifting is necessary
Safety	No danger of fire and explosion	Danger of fire and explosion, special protection measures must be taken
Health	<ul style="list-style-type: none"> <li>- PAH largely eliminated,</li> <li>- 3-MCPD not present,</li> <li>- Formaldehyde largely reduced</li> </ul>	High level on PAKs, 3-MCPD and Formaldehyde

<b>Environmental impact</b>		
	<b>CleanSmoke</b>	<b>Combustion Smoke</b>
Emissions to air	No emission is being produced	Emissions such as NO <sub>x</sub> , CO, TVOC are being produced  <b>CO:</b> 80,00 mg / Nm <sup>3</sup> <b>TVOC:</b> 352,00 mg / Nm <sup>3</sup>
Air treatment	Unnecessary	Necessary
Tar deposits <sup>1</sup>	No deposits	4,1 kg tar is being produced per 1 ton of smoked products
Ash deposits <sup>1</sup>	No deposits	7,8 kg ash is being produced per 1 ton of smoked products
Water consumption for cleaning <sup>1</sup>	0,037 m <sup>3</sup> per 1 ton of smoked products	0,30 m <sup>3</sup> per 1 ton of smoked products
Waste water pollution	<b>COD:</b> 384.377,76 g per 1 ton <sup>1</sup> <b>BOD:</b> 173.983,68 g per 1 ton <sup>1</sup> <b>Total N:</b> 1347,84 g per 1 ton <sup>1</sup> <b>PAH:</b> 0.48 mg per 1 ton <sup>2</sup> <b>HC-Index:</b> 0.19 g per 1 ton <sup>2</sup> <b>Phenols:</b> 0.35 g per 1 ton <sup>2</sup>	<b>COD:</b> 17.462.739,00 g per 1 ton <sup>1</sup> <b>BOD:</b> 11.122.762,00 g per 1 ton <sup>1</sup> <b>Total N:</b> 110.859,84 g per 1 ton <sup>1</sup> <b>PAH:</b> 76.04 mg per 1 ton <sup>2</sup> <b>HC-Index:</b> 1,86 g per 1 ton <sup>2</sup> <b>Phenols:</b> 53,11 g per 1 ton <sup>2</sup>
Cleaning detergent	0,34 litres per FU <sup>2,3</sup>	1,79 litres per FU <sup>2,3</sup>
		

<sup>1</sup> FDM\_BREF\_Fragebogen-MeatProcessing\_Heinrich Bille GmbH & Co. KG\_v2.xlsm

<sup>2</sup> Final report on life cycle assessment of meat products smoked by the use of purified primary smoke products in comparison to conventional smoking, Deutsches Institut für Lebensmitteltechnik e.V. (DIL)

<sup>3</sup> Functional unit (FU): 1 ton of smoked sausages



**Reference companies**

	<i>CleanSmoke</i>	<i>Combustion Smoke</i>
For the comparison	<ul style="list-style-type: none"> <li>• Heinrich Bille GmbH &amp; Co. KG</li> </ul>	<ul style="list-style-type: none"> <li>• Heinrich Bille GmbH &amp; Co. KG</li> </ul>
Further companies	<ul style="list-style-type: none"> <li>• Kleinemas Fleischwaren GmbH &amp; Co. KG</li> <li>• Die H. &amp; E. Reinert Westfälische Privat-Fleischerei GmbH - Vörden</li> <li>• Glocken-Beune GmbH</li> </ul>	