

Plastics Additives

Some facts in a nutshell

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Additives in plastics processing

What is the right choice of polymeric material

Market needs – Plastic parts in the specific market requirements

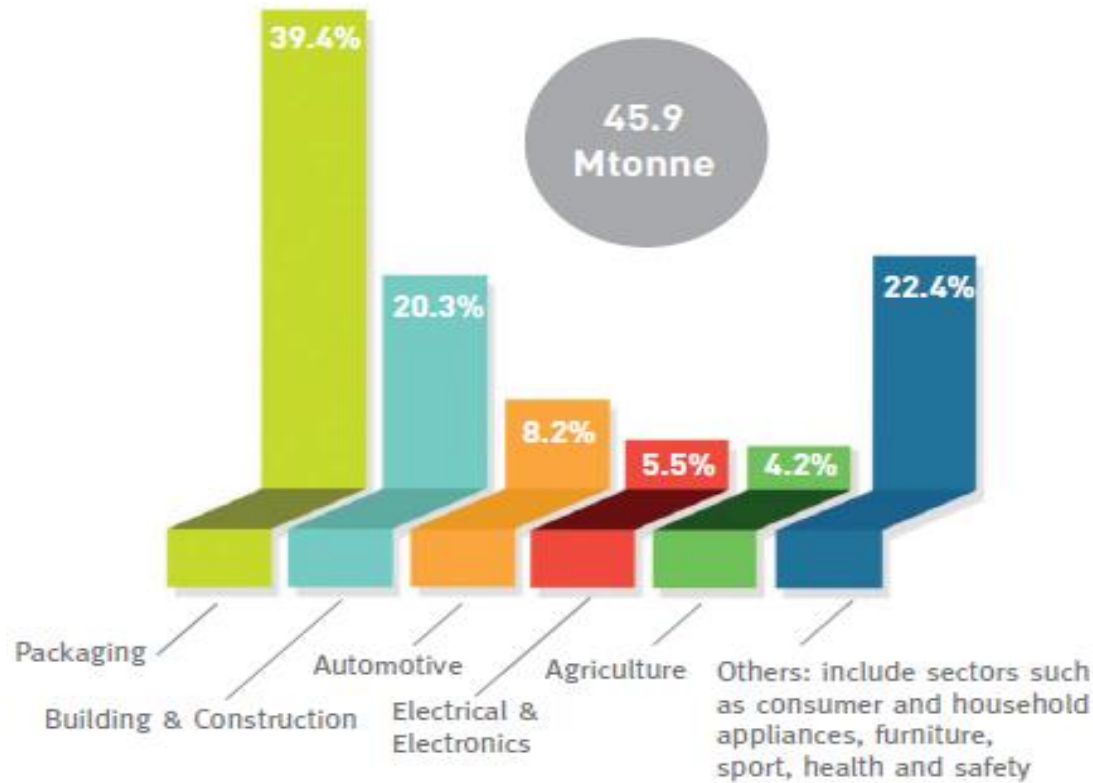
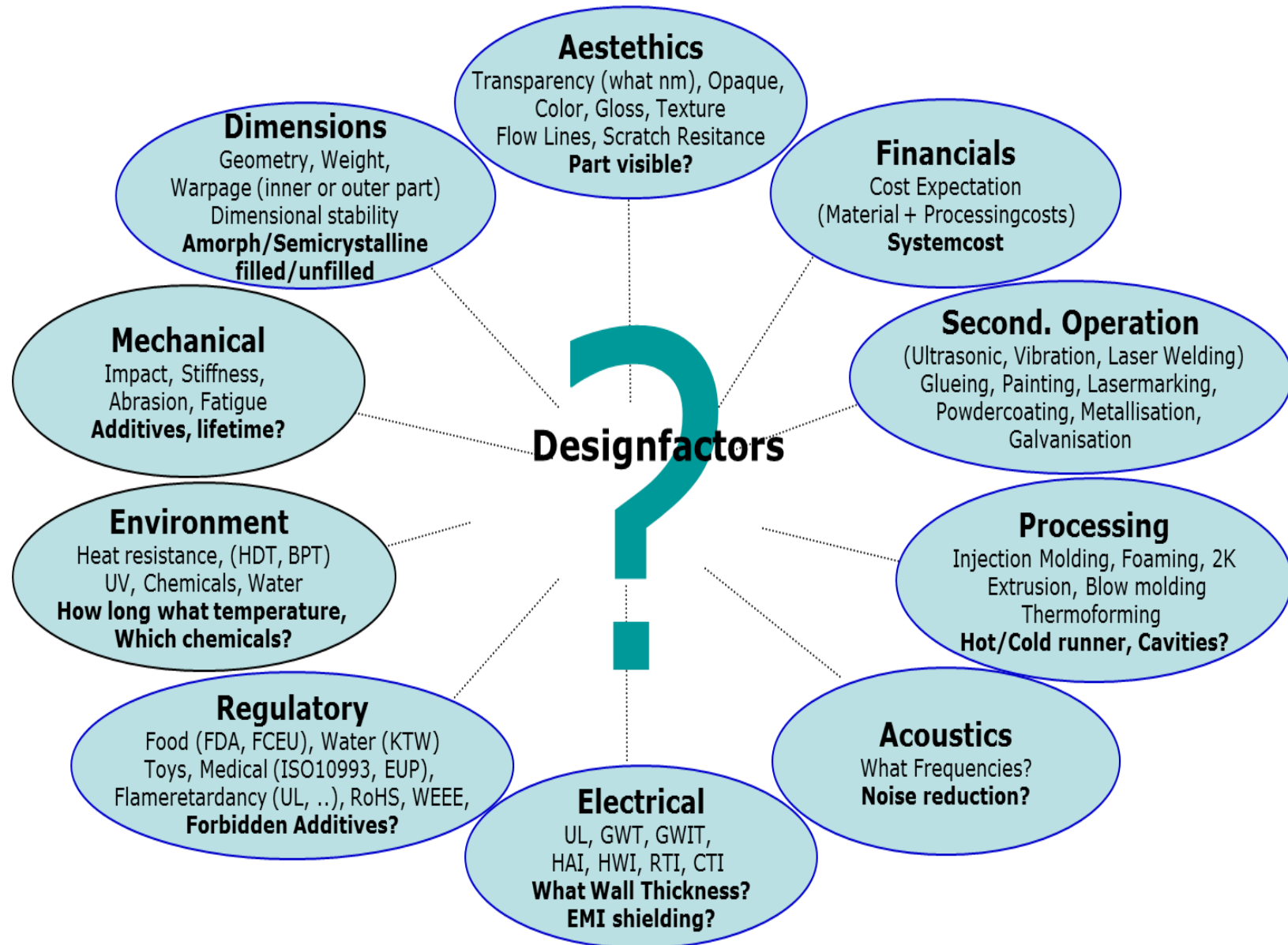


Figure 5: European plastics demand* by segment 2012

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

* EU-27+N/CH



Market needs – Plastic parts in the specific market requirements

Plastics demand by market

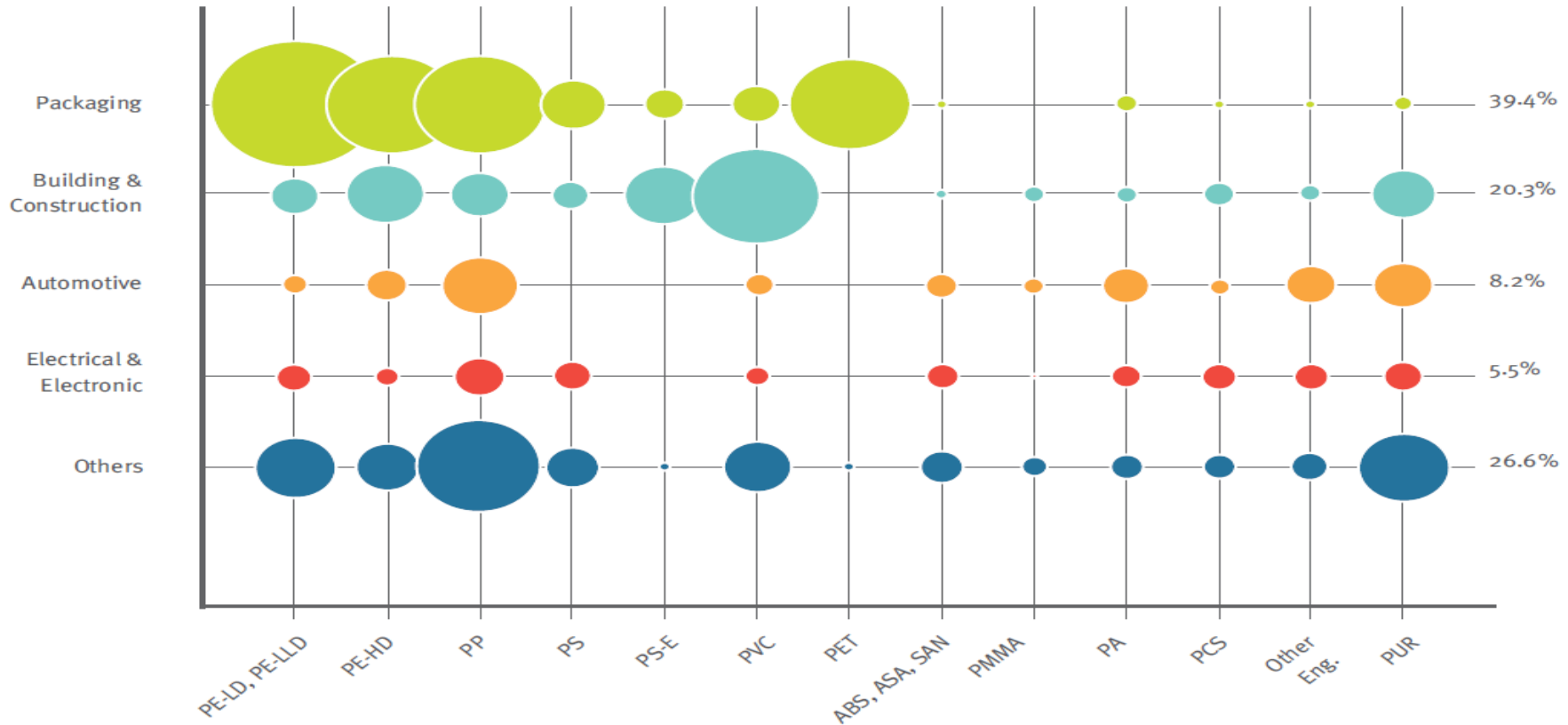
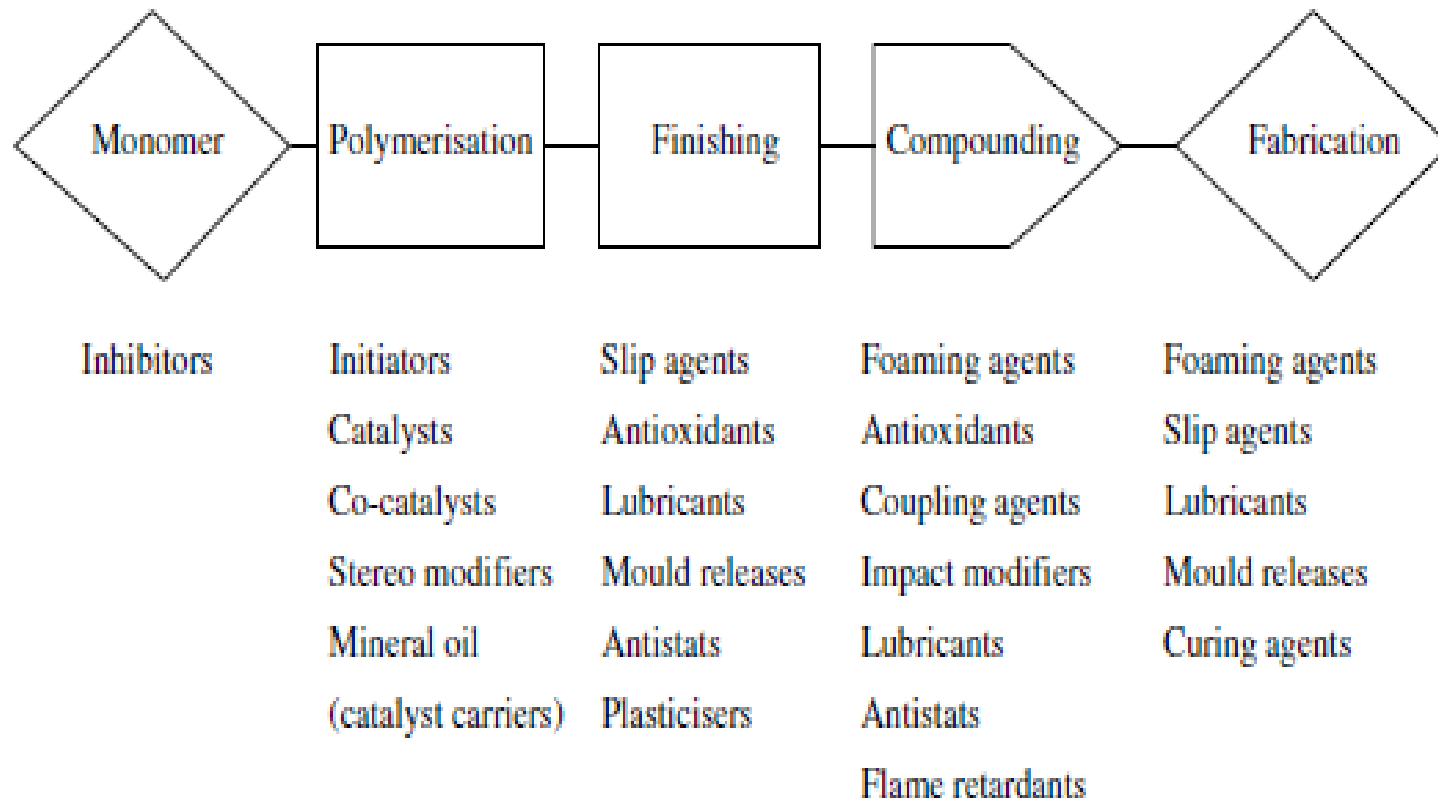


Figure 8: European plastics demand* by segment and resin type 2012

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

* EU-27+N/CH



Scheme 1.1 Exemplified application of additives in various stages of the production process of a polymeric material

Behavior and influence

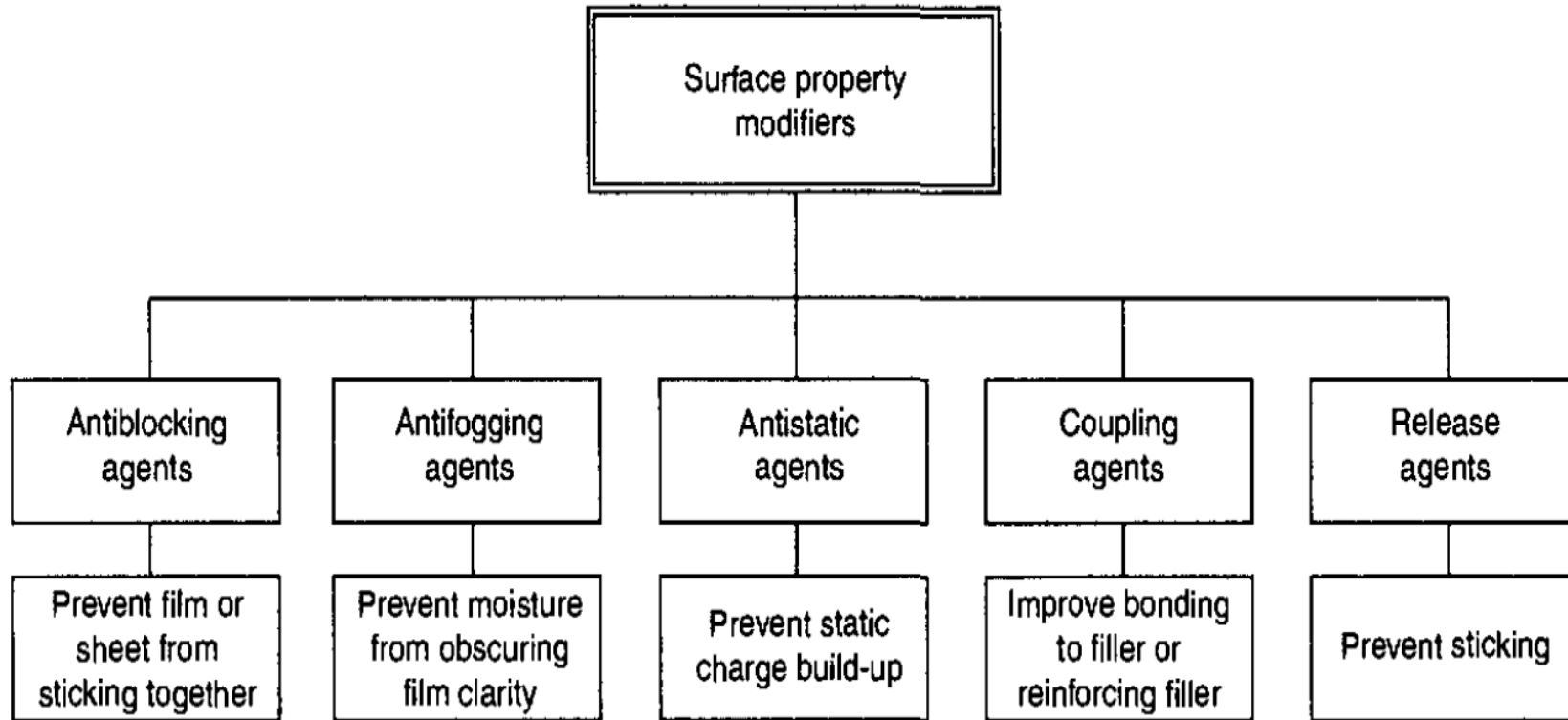


Figure 3.1 Flowchart of surface property modifiers.

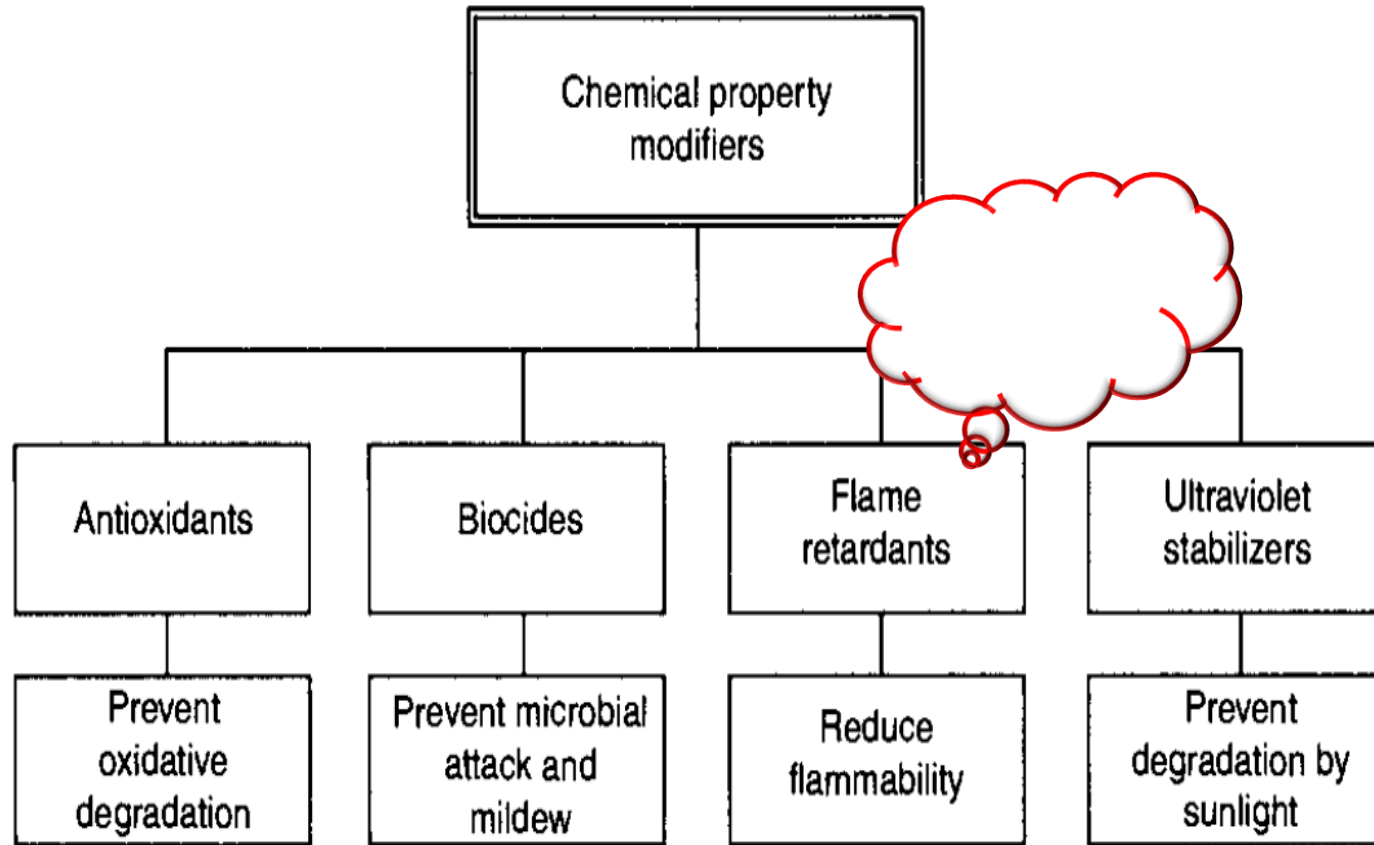


Figure 3.3 Flowchart of chemical property modifiers.

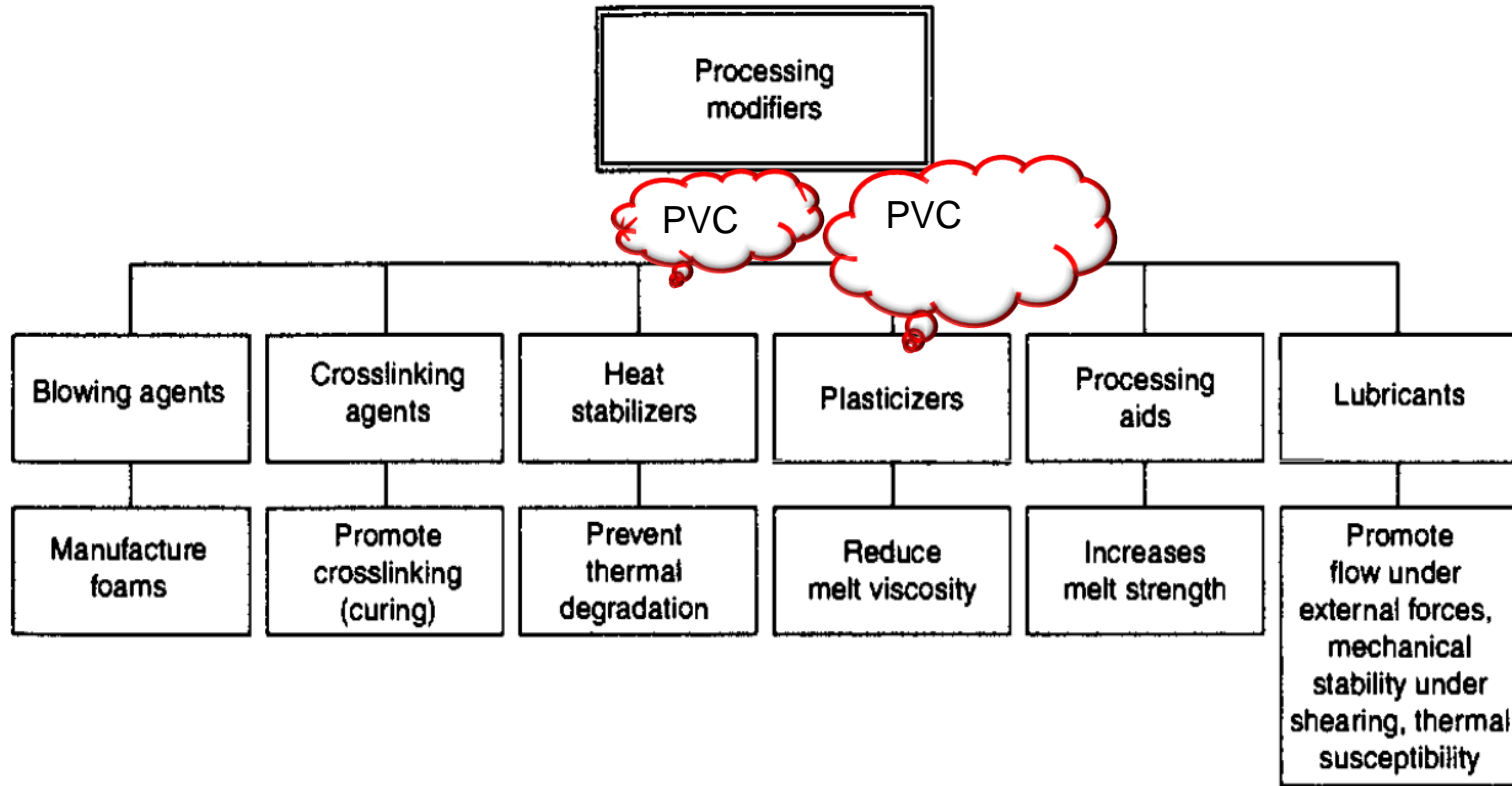


Figure 3.4 Flowchart of processing property modifiers.

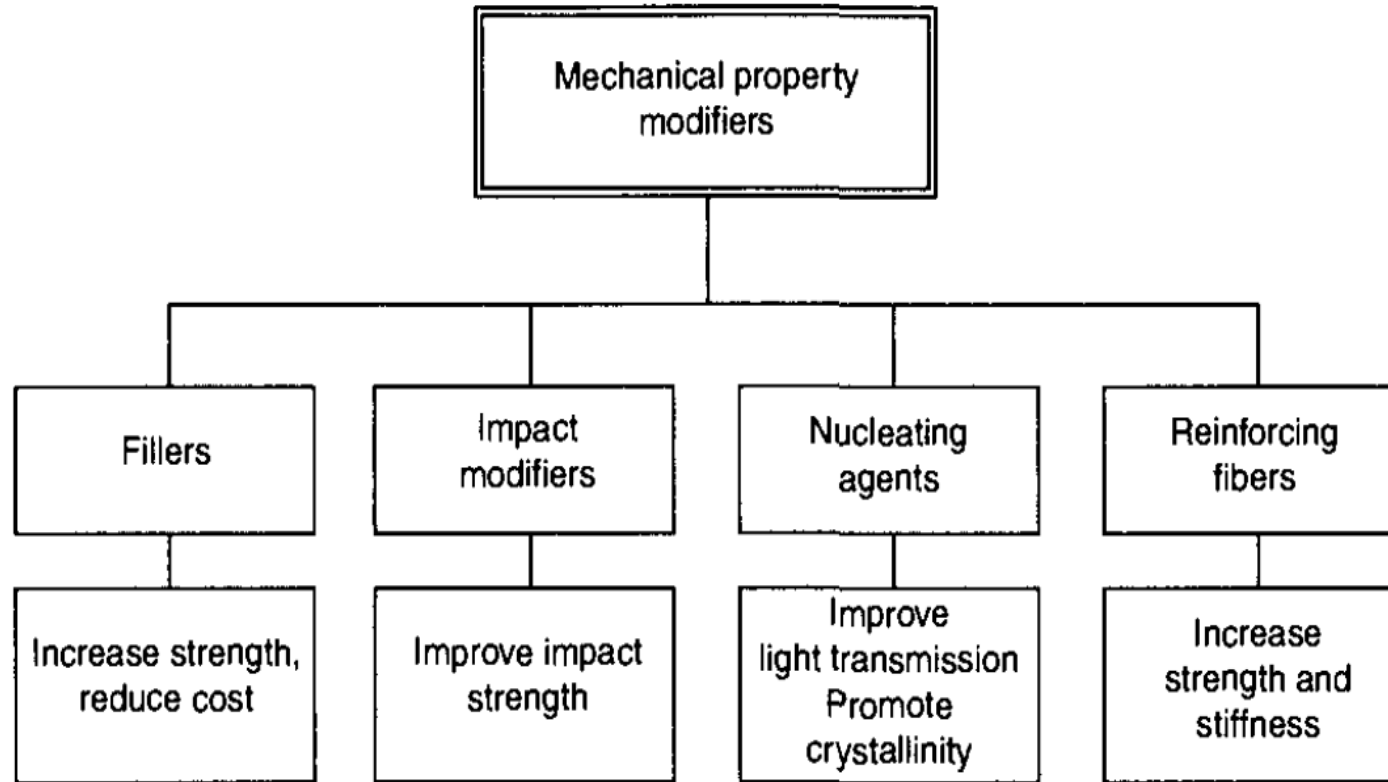


Figure 3.5 Flowchart of mechanical property modifiers.

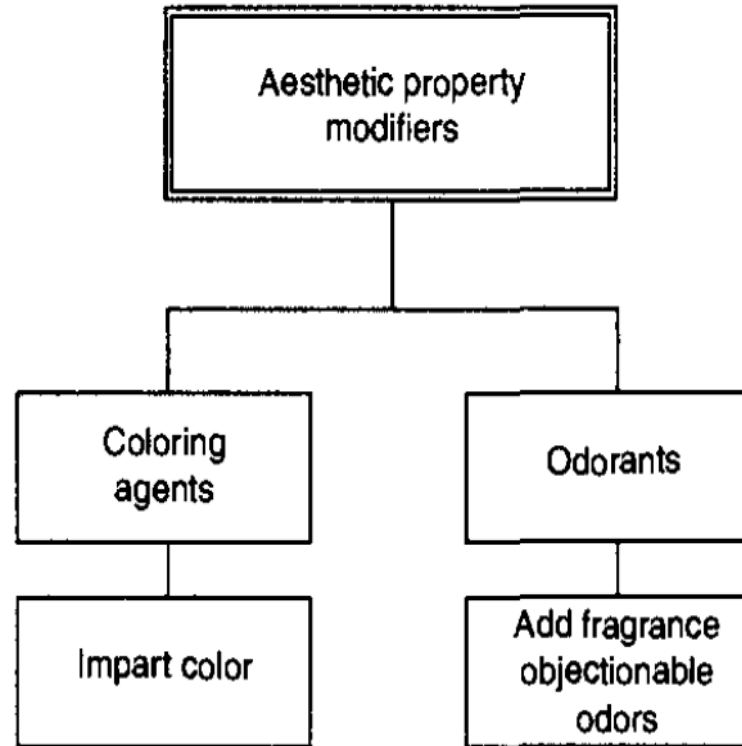


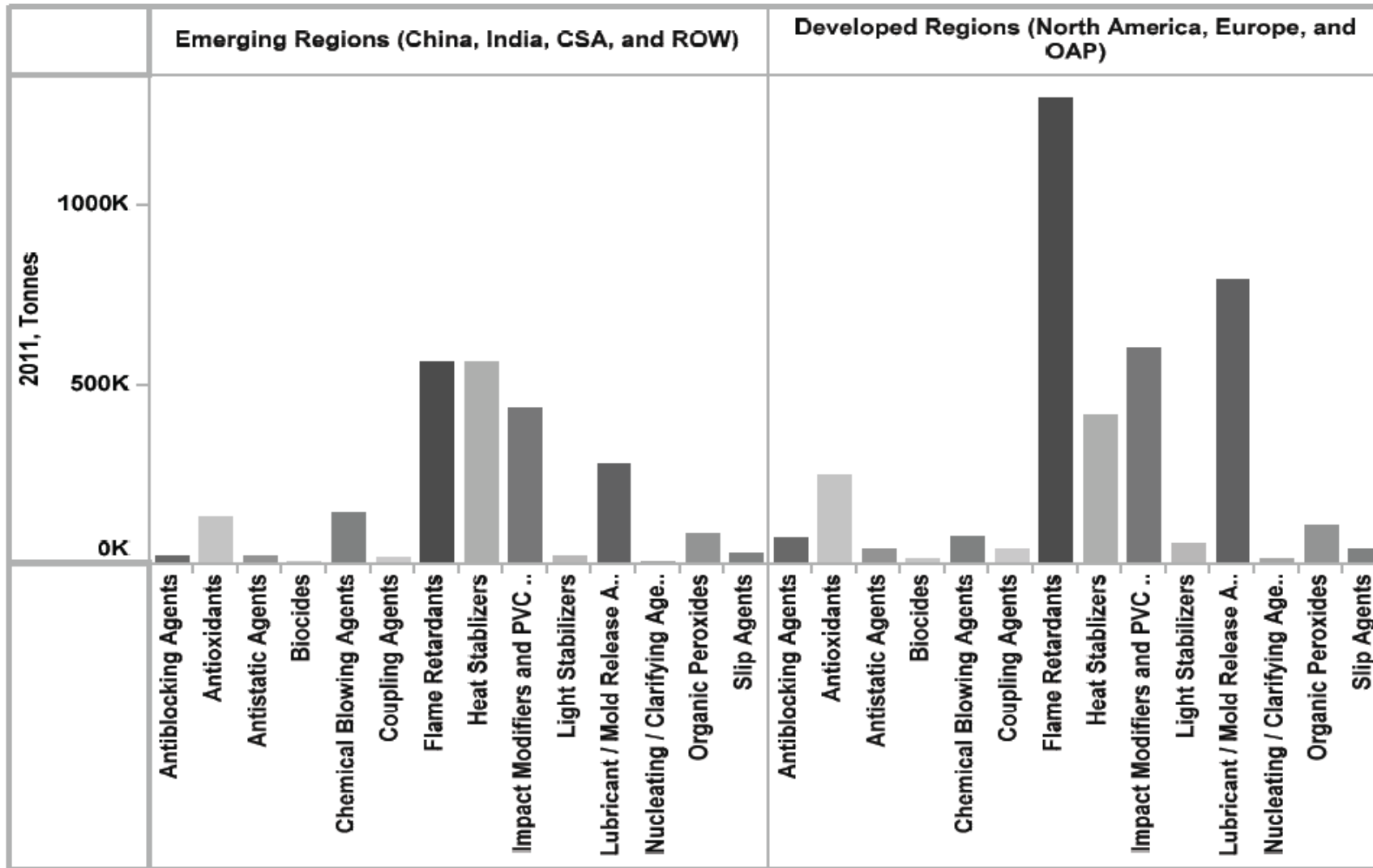
Figure 3.6 Flowchart of aesthetic property modifiers.

2. Growth by Additive Type in Emerging Regions (2007 – 2016)

Additive	Regions					
	Developed Regions (North America, Europe, and OAP)			Emerging Regions (China, India, CSA, and ROW)		
	2007, Tonnes	2011, Tonnes	% AAGR 2007 - 2011	2007, Tonnes	2011, Tonnes	% AAGR 2007 - 2011
Antiblocking Agents	71,100	70,090	-0.4%	16,000	21,780	8.0%
Antioxidants	264,900	243,900	-2.0%	72,000	129,200	15.7%
Antistatic Agents	36,675	38,960	1.5%	14,100	20,940	10.4%
Biocides	12,770	12,120	-1.3%	2,730	3,750	8.3%
Chemical Blowing Agents	82,900	75,050	-2.5%	114,200	141,550	5.5%
Coupling Agents	31,740	35,530	2.9%	12,510	17,370	8.6%
Flame Retardants	1,249,750	1,296,490	0.9%	418,650	561,510	7.6%
Heat Stabilizers	470,900	411,950	-3.3%	440,100	564,400	6.4%
Impact Modifiers and PVC Processing Aids	622,500	599,800	-0.9%	328,500	433,400	7.2%
Light Stabilizers	52,355	53,270	0.4%	12,350	21,330	14.6%
Lubricant / Mold Release Agents	772,860	791,900	0.6%	224,040	280,800	5.8%
Nucleating / Clarifying Agents	9,700	9,880	0.5%	2,150	3,270	11.1%
Organic Peroxides	123,500	109,750	-2.9%	83,100	80,150	-0.9%
Plasticizers	3,661,000	3,196,200	-3.3%	2,989,000	3,706,300	5.5%
Slip Agents	34,800	36,600	1.3%	15,300	24,900	12.9%
Totals/Avg	7,497,450	6,981,490	-1.8%	4,744,730	6,010,650	6.1%

Source: Townsend Solutions Estimate

Figure 1. Plastics Additives Demand 2011



Excluding Plasticizers

Source: Townsend Solutions Estimate

PVC Heat Stabilizer

The global heat stabilizer market is undergoing widespread change due to environmental pressure on heavy metals, notably lead. Cadmium is all but gone. Barium, a key component of many of the heavy-metal-replacement stabilizer systems for flexible PVC, may be the next metal to come under scrutiny for toxicity. Consequently, suppliers are working to come up with environmentally friendly systems, especially improved calcium/zinc formulations. The new replacements are quickly evolving to provide performance at least equal to that of their heavy metal counterparts, while at the same time narrowing the cost differential. The switch from lead to mixed metals stabilizers has resulted in numerous improvements to existing products. Any switch from lead to Ca-Zn stabilizers results in the loading going up (from 0.5% to 1%) and a probable change in lubricant type.

PVC Phtalate issue (Migration)

The EU has restricted some phthalates since 1999, and in 2005 banned DEHP, DBP, and BBP in all products for young children, and banned DINP, DIDP, and DNOP in items intended to be mouthed by children (European Directive 2005/84/CE). In 2008, the US Consumer Product Safety Improvement Act (CPSIA) limited the amount of certain phthalates (DEHP, DBP, DIDP, DNOP, and BBP) to 0.1% in children's toys and child-care articles, and in 2009 banned DEHP in these applications completely. In January 2010, Australia's Consumer Affairs minister banned products containing more than 1% DEHP. The EU Medical Device Directive (2007/47/EC) required medical devices plasticized with DEHP be labeled as such beginning in March 2010. While some preliminary studies are being conducted in France on banning DEHP in medical uses, the additive has an important benefit of preventing blood clotting and so use is likely to continue.

Another EU regulation affecting plasticizers is the EU Construction Products Regulation, adopted January 18, 2011, which restricts emissions and volatile organic compounds (VOCs) from construction products like flooring and wall coverings. The regulation leaves specific restrictions up to the member states, but, in general, low-molecular weight phthalates like DEHP, BBP, and DBP would be affected. The VOC restrictions are not specific to phthalates; some non-phthalate plasticizers like benzoates can also be affected.

The EU REACH legislation classifies some low-molecular weight phthalates (DEHP, DBP, BBP, DIBP) as substances of very high concern, which means that they would need special authorization to use, and thus are being phased-out as replacements are identified. High-molecular weight phthalates like DINP, DIDP, and DPHP are not classified under REACH but are still subject to negative public opinion.

