



Plastics Burn & Smell Test – Brief with Technical Support *(Identification of each plastic based on burn behavior and smell)*

This blog provides a concise reference for identifying common plastic materials based on their burn characteristics, flame color, smell, and behaviour during combustion. These sensory tests, often called the **Burn & Smell Test**, are useful for quick, low-cost identification of plastic types, especially in recycling, material sorting, and quality control environments. While not a substitute for instrumental analysis, these observations—when combined with technical tests like FTIR, MFI, and density checks—can provide a strong preliminary identification of polymers. This guide also lists the typical applications and testing tools used in plastic identification and recycling workflows.

No.	Plastic Type	Resin Code	Burn Flame	Smell	Burn Behavior	Technical Note
1	PET (Polyethylene Terephthalate)	♻️ 1	Blue-yellow	Sweet (sugar-like)	Shrinks, drips, burns slowly	Density ~1.38 g/cm ³ ; sinks in water
2	HDPE (High Density Polyethylene)	♻️ 2	Blue-yellow	Waxy	Burns, drips, low smoke	Floats in water; MFI confirms grade
3	PVC (Polyvinyl Chloride)	♻️ 3	Green flame	Sharp, pungent, sour	Tends to self-extinguish, green smoke	Releases HCl gas (acidic); toxic
4	LDPE (Low Density Polyethylene)	♻️ 4	Blue-yellow	Waxy	Melts quickly, drips	Softer than HDPE; lower density
5	PP (Polypropylene)	♻️ 5	Blue-yellow	Slight waxy	Burns, melts, clean smoke	Floats; MFI test helps in grade ID
6	PS (Polystyrene)	♻️ 6	Yellow, black smoke	Styrene-like	Burns quickly, brittle, soot	Becomes brittle; density ~1.05
7	ABS (Acrylonitrile Butadiene Styrene)	♻️ 7	Yellow, black smoke	Burnt rubber-like	Softens, produces smoke	Hard; used in electronics, toys
8	PC (Polycarbonate)	♻️ 7	Yellow, slow	Mild phenol-like	Burns slowly, chars	Tough; high Tg; sinks in water
9	PMMA (Acrylic)	♻️ 7	Blue, clean flame	Fruity/ester-like	Burns cleanly, no soot	Clear, brittle, decorative use
10	Nylon (Polyamide, PA)	♻️ 7	Blue-yellow	Burning hair-like	Burns slowly, may self-extinguish	Engineering plastic; self-extinguishing
11	POM (Acetal)	♻️ 7	Blue, popping	Sharp, formaldehyde-like	Burns rapidly, cracks/pops	Emits toxic formaldehyde; dangerous

Application Areas & Key Equipment

No.	Purpose	Key Equipment
1	Identification	FTIR, NIR, Burn Test
2	Chemical Analysis	XRF, Ash Tester
3	Thermal Analysis	DSC, TGA
4	Quality Control	MFI, Density Kit
5	Recycling	NIR Sorter, Burn Setup, FTIR