

Research Reference Guide

Detergent Market · Natural Alternatives · Borax Deep Dive · Burlington, Ontario

A

Detergent Comparison

Enzyme payload, surfactant types, and value — all brands ranked

BRAND	COST/LOAD	ENZYM E	SURFACTANTS	VERDICT
Kirkland Ultra Clean (Costco)	\$0.12–0.18	9/10	LAS + AES + Nonionic	BEST VALUE*
Arm & Hammer	\$0.15–0.22	4/10	LAS + mild nonionic	OK
All Free & Clear	\$0.22–0.30	6/10	AES + Nonionic	SENSITIVE SKIN
Gain Original	\$0.25–0.38	3/10	LAS + AES (low)	SKIP
Tide Original	\$0.28–0.40	7/10	LAS + AES + Nonionic	WORTH IT
Tide Hygienic Clean	\$0.35–0.48	9/10	LAS + AES + Nonionic	WORTH IT
Persil ProClean	\$0.38–0.52	10/10	LAS + AES + Alcohol Ethoxylate	WORTH IT
Seventh Generation	\$0.40–0.58	5/10	APG (plant-derived)	ECO PICK
Dirty Labs	\$0.55–0.80	10/10	Bio-derived + DNase	ACTIVEWEAR

* Kirkland/Henkel:

Widely reported by independent testing to be manufactured by Henkel (Persil maker). Not officially confirmed by Costco or Henkel. The enzyme profile and performance data align closely with Persil ProClean.

B

Natural Alternatives — Honest Verdict

Fact-based assessment of every popular green cleaning option

PRODUCT	CHEMISTRY	VERDICT	NOTES
Citric Acid (Bulk Barn)	C ⁺ H ⁺ O ⁻ Tricarboxylic acid	EXCELLENT	Best rinse-cycle additive. Chelates Ca ²⁺ /Mg ²⁺ with 3 carboxyl groups. No residue. Outperforms fabric softener in every way.
DIY Washing Soda	NaHCO ⁺ + heat → Na ⁺ CO ⁻	WORKS	Bake baking soda at 200°C for 60 min. Identical chemistry to commercial washing soda.
Sodium Percarbonate (OxiClean)	Na ⁺ CO ⁻ ·1.5H ⁺ O ⁻ Oxygen bleach	EXCELLENT	Technically synthetic but safest bleach chemistry available. Degrades to water + CO ⁻ .
Soap Nuts	Saponins Natural surfactants	LIMITED	Real surfactant chemistry but too weak for heavy soils. Cold water: ineffective. No enzymes, no builders.
White Vinegar	CH ⁺ COOH pH 2.4–3.4	LIMITED — use citric instead	Works as rinse acid. Weaker chelator than citric acid. May degrade rubber machine seals with repeated use.
Castile Soap	Saponified oils True soap	AVOID in Burlington	Reacts with Ca ²⁺ /Mg ²⁺ in hard water forming lime soap scum. Will make clothes greyer and stiffer. Dr. Bronner's warns against hard water laundry use.
Baking Soda alone	NaHCO ⁺ pH 8.3	BOOSTER only	pH 8.3 insufficient for saponification or meaningful fiber swelling. Use as odour booster in wash alongside real detergent only.
Essential Oil “Detergents”	Terpene mixtures No surfactant activity	USELESS	Zero surfactant, enzyme, or chelation activity. Fragrance only. Tea tree antifungal properties do not survive laundry dilution.

C

Borax — The Reality Check

Na⁺B⁻O⁻·10H⁺O · pH 9.3 · 20 Mule Team

PROPERTY	BORAX	WASHING SODA
Chemical formula	Na[B(O)10H]O	NaCO
pH in solution	~9.3 (mild)	~11 (aggressive)
Saponifies oils?	No	Yes — pH 11 required
Chelation	Mild borate chelation	Precipitating (makes solids)
Antifungal?	Yes — disrupts fungal cell walls	No
EU safety status	Banned in consumer products (Repro Toxin 1B, ECHA 2010)	Permitted
Best for	Hard water boost, musty towels, general laundry loads	Industrial grease, scrap yard, heavy cotton loads
Safe for delicates?	Yes (at half dose)	No — too aggressive

■ Borax Safety:

EU-banned for reproductive toxicity data (high-dose animal studies). Normal adult laundry use = low risk. Wear gloves. Do not inhale powder. Keep from children and pets. Do NOT use for baby laundry.

D Final Verdict Buy this. Skip this. Use with eyes open.		
BUY THIS	SKIP THIS	USE WITH AWARENESS
Kirkland Ultra Clean (Costco) Persil ProClean or Tide Hygienic Citric Acid — food-grade bulk OxiClean / Sodium Percarbonate Arm & Hammer Washing Soda	Gain (fragrance over enzymes) Castile soap (hard water disaster) Essential oil "detergents" Baking soda + vinegar together Dryer sheets (wax film trap)	Borax — useful, but handle carefully. EU-banned for repro toxicity data. Never for baby laundry. Seventh Generation / Method — eco claims hold up; cleaning does not.