

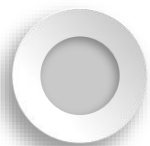
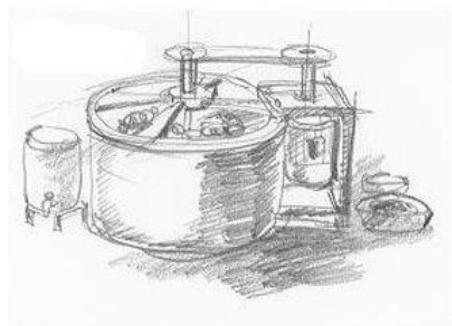
Challenges and Opportunities from HE Washing Machine

来自高效洗衣机的挑战与机遇

安利(中国)研发中心

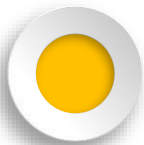


洗衣机发展历程



手动式洗衣机

1858年，美国人汉密尔顿史密斯在匹茨堡制成了世界上第一台洗衣机。该洗衣机的主件是一只圆桶，桶内装有一根带有桨状叶子的直轴。轴是通过摇动和它相连的曲柄转动的。



电动洗衣机

1907年，美国的费希尔在芝加哥试制成功世界上第一台电动洗衣机。电动洗衣机的问世，标志着人类家务劳动自动化的开端。



现代洗衣机

1922年，美国玛塔依格公司改造了洗衣机的洗涤结构，把拖动式改为搅拌式，使洗衣机的结构固定下来，这也就是第一台搅拌式洗衣机的诞生。



高效洗衣机

90年代中后期开始，以环保理念为契机，从欧洲为开端，节能省水的高效洗衣机逐渐流行

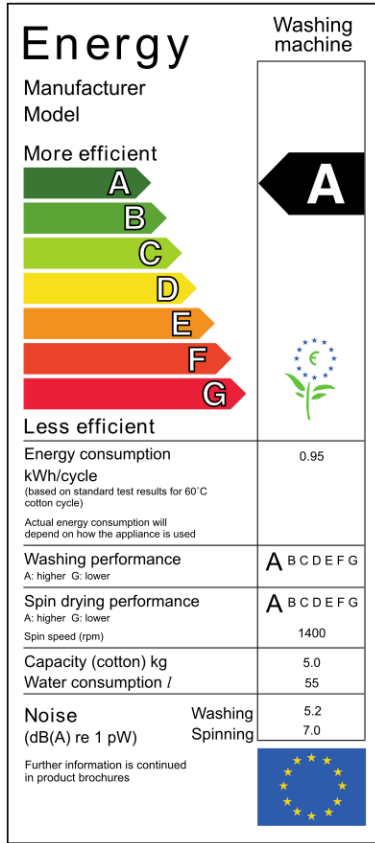




欧盟洗衣机能效相关



EU



topten.eu Best Products of Europe

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Search: Enter search ...

Categories: Cars Household Lighting Office Equipment Consumer Electronics Building Components Professional Refrigerators

You are here: Home » Selection Criteria » Washing Machines

Selection Criteria Washing Machines

Table of Contents

- Methodology
- Glossary
- Infoplus

Recommendations

- Washing Machines

Product List

- Washing machines
- <8kg
- 8kg
- >8kg

Methodology

Scope

Topten.eu – Best products of Europe – presents the most energy efficient household washing machines of Europe. Topten presents three categories of washing machines:

- Washing machines with a capacity < 8 kg
- Washing machines with a capacity of 8 kg
- Washing machines with a capacity > 8 kg

Technical criteria

In order to qualify for Topten.eu, washing machines must meet the following criteria:

- Energy efficiency class: A+++ according to the EU energy label
- Spin-drying efficiency class: A according to the EU energy label
- Available in at least one European country.

In addition, suppliers have to provide Topten with the following data:

- Energy Efficiency Index (EEI)
- Energy consumption per cycle in kWh for the 60°C programme at full load, the 60°C programme at half load and the 40°C programme at half load
- Programme time for the 60°C programme at full load, the 60°C programme at half load and the 40°C programme at half load
- Power in left-on-mode and off-mode
- Maximum spin speed
- Availability of a water protection system (Aqua Stop, waterproof, water control system etc.)

The EU requires washing machines carry an efficiency label

TopTen European organizations provide independent recommendations



相关产品列表:

[洗衣机](#)
[滚筒 洗涤容量<7千克](#)
[滚筒 洗涤容量=7千克](#)
[波轮 洗涤容量<7千克](#)
[波轮 洗涤容量 ≥ 7千克](#)

消费者建议: 洗衣机节能节水窍门
 选择标准: 滚筒洗衣机
 Excel产品表格文件下载
 打印本页

品牌	海尔	LG	海尔	海尔	海尔	海尔	海尔
型号	XQGH80-B12768	WD-RH450B7H	@G9012B868S	EG10014BDX59SU1	XQG100-HBDX14756GU1	XQG100-BDX14756GU1	XQG120-HBDX14696L
类似型号							
参考价格 (元)	4'999	8'099	2'799	5'699	5'999	4'999	8'999
◆电费 (1000次, 元)	260	415	360	400	400	400	486
◆水费 (1000次, 元)	208	280	232	240	240	240	300
◆洗净比	1.05	1.03	1.03	1.03	1.03	1.03	1.03
◆洗涤重量 (千克)	8	10.5	9	10	10	10	12
◆耗电量 (度/工作周期/千克)	0.065	0.079	0.08	0.08	0.08	0.08	0.081
◆用水量 (升/工作周期/千克)	6.5	6.67	6.44	6	6	6	6.25
能效等级	1	1	1	1	1	1	1
◆脱水转速 (转/分钟)	1'200	1'400	1'200	1'400	1'400	1'400	1'400



美国洗衣机能效相关



USA

ABOUT ENERGY STAR PARTNER RESOURCES

The simple choice for energy efficiency.

ENERGY EFFICIENT products ENERGY SAVINGS at home ENERGY EFFICIENT new homes ENERGY STRATEGIES FOR buildings & plants

Home » Certified Products » Appliances » Clothes Washers » Key Product Criteria

Certified Products Your source for energy efficient product information

All Certified Products Appliances Lighting Office Equipment Electronics Product Specifications Search

Clothes Washers Key Product Criteria

The ENERGY STAR criteria for clothes washers was changed on March 7, 2015 and is as follows:

Product Type	Current Criteria Levels (as of March 7, 2015)
ENERGY STAR Residential Clothes Washers, Front-loading (> 2.5 cu-ft)	IMEF ≥ 2.38 IWF ≤ 3.7
ENERGY STAR Residential Clothes Washers, Top-loading (> 2.5 cu-ft)	IMEF ≥ 2.06 IWF ≤ 4.3
ENERGY STAR Residential Clothes Washers (≤ 2.5 cu-ft)	IMEF ≥ 2.07 IWF ≤ 4.2
ENERGY STAR Commercial Clothes Washers	MEF ≥ 2.2 WF ≤ 4.5

ENERGY STAR Qualified Clothes Washer Eligibility

Only front and top-loading clothes washers with capacities greater than 1.6 ft³ and less than 6.0 ft³; and are not defined as Combination All-In One Washer-Dryers or Residential Clothes Washers with an Optional Dry Cycle are eligible for ENERGY STAR Certification.

Energy Performance Metrics

Modified Energy Factor, MEF, is the energy performance metric for ENERGY STAR certified commercial clothes washers as of March 7, 2015.

MEF is the quotient of the capacity of the clothes container, C, divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the sum of the machine electrical energy consumption, M, the hot water energy consumption, E, and the energy required for removal of the remaining moisture in the wash load, D. The higher the value, the more efficient the clothes washer is. The equation is shown below and the metric units are ft³/kWh/cycle:



- Home
- Consumers (*en español*)
- Businesses
- Builders/Manufacturers
- General Information
- About TIAP
- Contact Us

The Tax Incentives Assistance Project (TIAP) www.energytaxincentives.org

The Tax Incentives Assistance Project (TIAP), sponsored by a coalition of public interest nonprofit groups, government agencies, and other organizations in the energy efficiency field, is designed to give consumers and businesses information they need to make use of the federal income tax incentives for energy efficient products and technologies passed by Congress as part of the Energy Policy Act of 2005 and subsequently amended several times.

Update as of 12/22/14

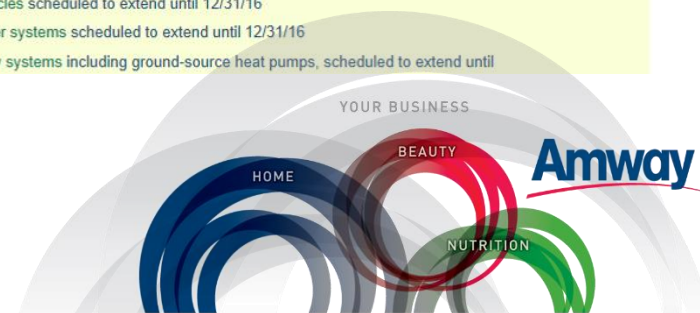
Several tax incentives were extended as part of the Tax Increase Prevention Act of 2014, also known as the "tax extenders package," passed on December 19, 2014. Qualification levels from 2013 were not changed. The following energy efficiency measures are eligible for these incentives, if installed by December 31, 2014:

- Residential energy efficiency improvements including:
 - Windows, insulation, air sealing homes and duct sealing;
 - Air conditioners, heat pumps, furnaces and water heaters.
- Builder incentives for energy efficient new homes;
- Energy efficient new and retrofitted commercial buildings;

The new Congress will have to decide whether to extend these again to cover 2015. We will post updates on our website if there are any updates or changes.

These other four incentives remain in place and unchanged from the prior law:

- Plug-in electric drive vehicles scheduled to extend until 12/31/16
- Combined heat and power systems scheduled to extend until 12/31/16
- On-site renewable energy systems including ground-source heat pumps, scheduled to extend until





中国洗衣机能效相关



China

洗净比

洗涤桶有效容积

漂洗率

待机功耗

用水指数

关机功耗

GB/T 4288-2008

《家用电动洗衣机》

QB/T 4829-2015

《家用和类似用途节水型洗衣机技术要求及试验方法》



GB12021.4-2013

《电动洗衣机能效水效限定值及等级》





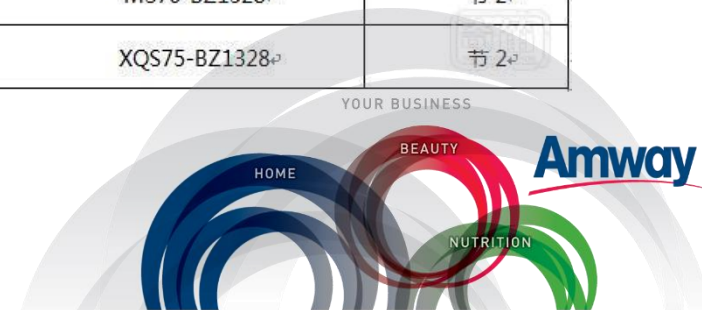
中国洗衣机能效相关



附：首批通过 QB/T4829-2015 标准检测洗衣机产品名单（排名不分先后）

企业名称	品牌	通过 QB/T4829-2015 标准的型号	节水等级
无锡小天鹅股份有限公司	小天鹅	TD80-1411DXS	节 1
		TD80-1416MPDG	节 1
合肥美的洗衣机有限公司	美的	MG90-1433WDXG	节 2
		MD80-1405DQCG	节 1
杭州松下家用电器有限公司	松下	XQG90-VD9059	节 2
		XQG100-E1255	节 1
		XQB80-X8156	节 3
广东海信冰箱营销股份有限公司	海信	XQB75-V6702LD	节 2
		XQG80-B1402FPCI	节 1
金羚电器有限公司	金羚	DX90-B15SIT	节 1
	卡迪	GV LHWS1594	节 1
青岛海尔洗衣机有限公司	海尔	MS70-BZ1528	节 2
		XQS75-BZ1328	节 2

首批通过QB/T4829-2015标准认证的节水型洗衣机



现实意义



传统洗涤模式



高效节水洗涤模式

VS





风险还是机遇？

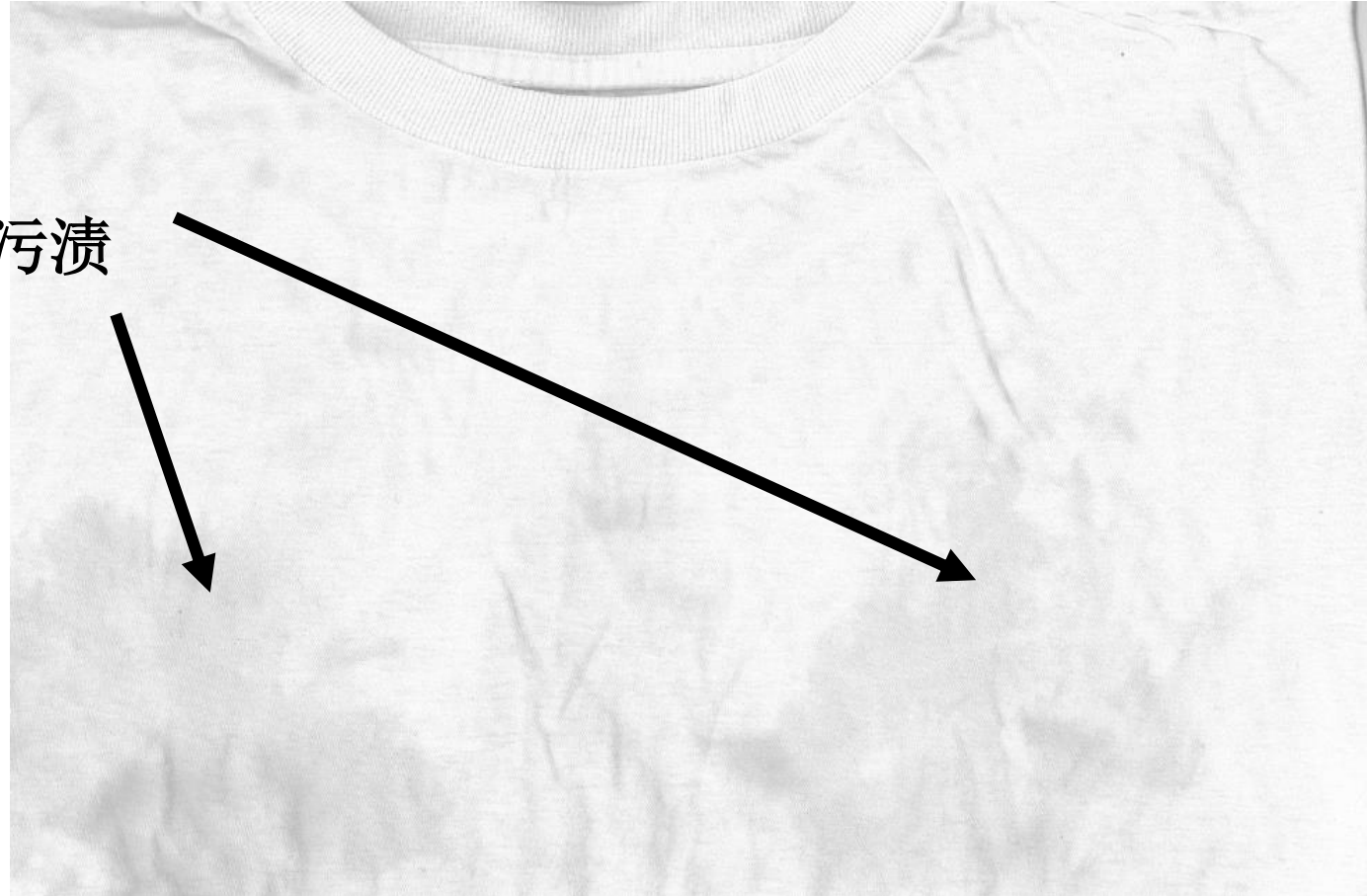




源于1998年的消费者投诉



洗涤后出现的污渍



来源分析



1. 仅在欧洲市场出现投诉
2. 投诉频率比较低
3. 投诉中出现的染色是永久性的
4. 染色的位置和形状

可能来源分析



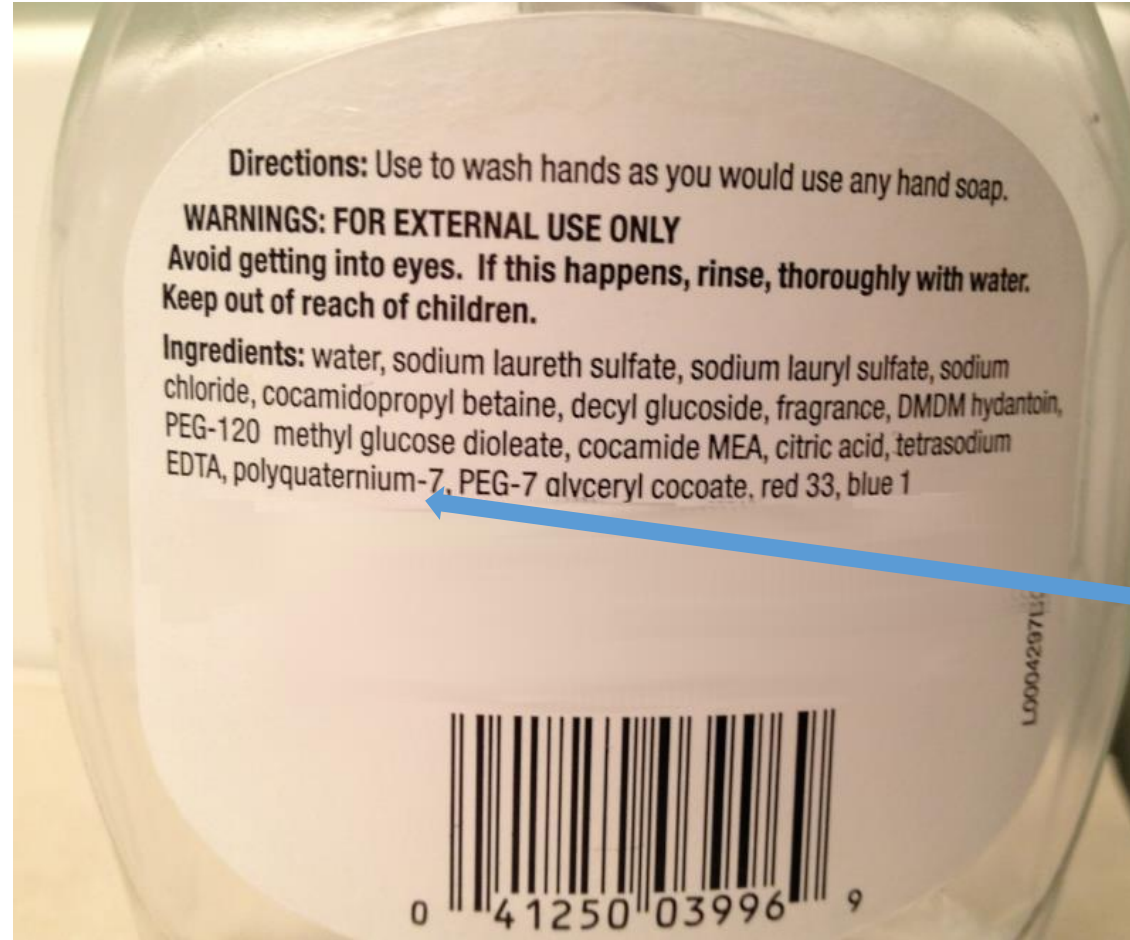
1. 仅在欧洲市场出现投诉
2. 投诉频率比较低
3. 投诉中出现的染色是永久性的
4. 染色的位置和形状

可能的来源：发用或者身体用产品





来源分析



Directions: Use to wash hands as you would use any hand soap.
WARNINGS: FOR EXTERNAL USE ONLY
Avoid getting into eyes. If this happens, rinse, thoroughly with water.
Keep out of reach of children.
Ingredients: water, sodium laureth sulfate, sodium lauryl sulfate, sodium chloride, cocamidopropyl betaine, decyl glucoside, fragrance, DMDM hydantoin, PEG-120 methyl glucose dioleate, cocamide MEA, citric acid, tetrasodium EDTA, polyquaternium-7, PEG-7 alvceryl cocoate, red 33, blue 1

聚季铵盐-7



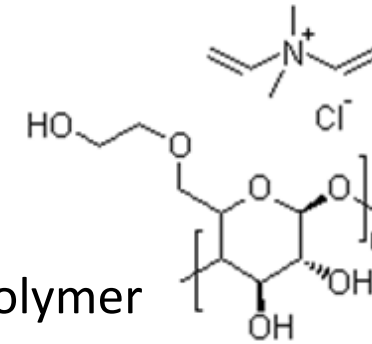
可能来源分析

聚季铵盐是潜在的污点来源

定型摩丝

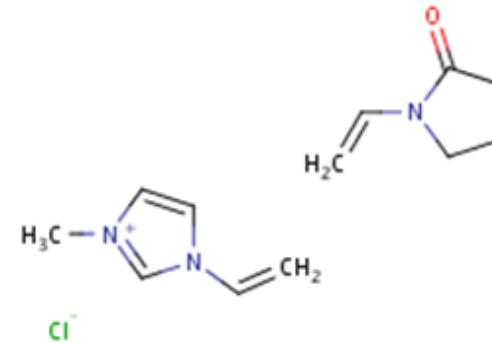
Polyquaternium 4

hydroxyethylcellulose and diallyldimethyl ammonium chloride copolymer



Polyquaternium 16

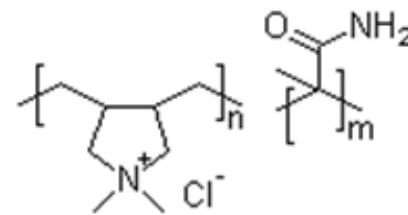
vinylimidazolium and vinylpyrrolidone polymer



洗手液

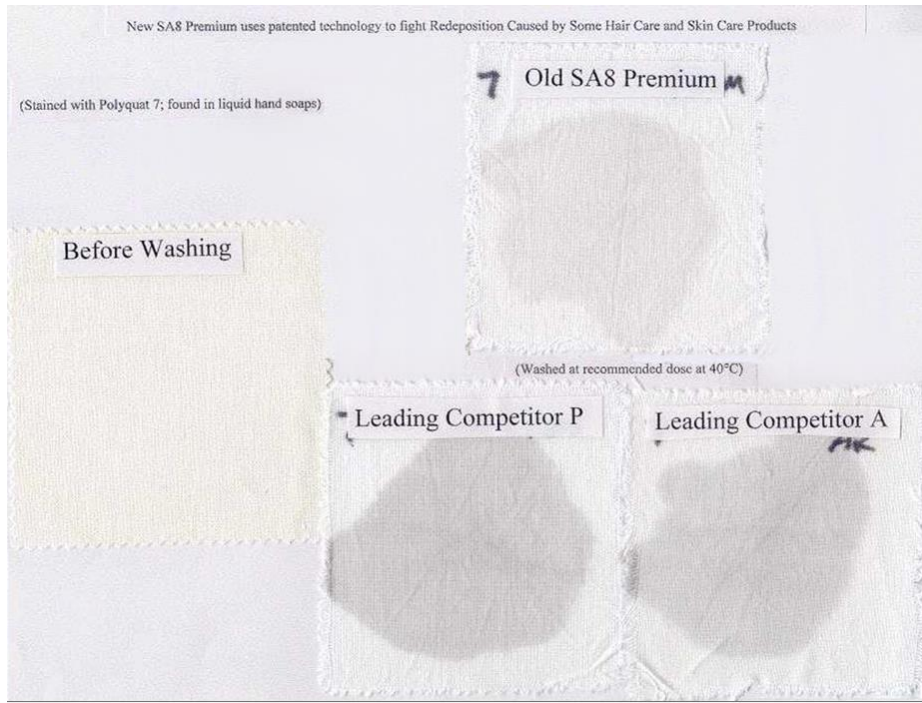
Polyquaternium 7

propenamminium/propenamide polymer



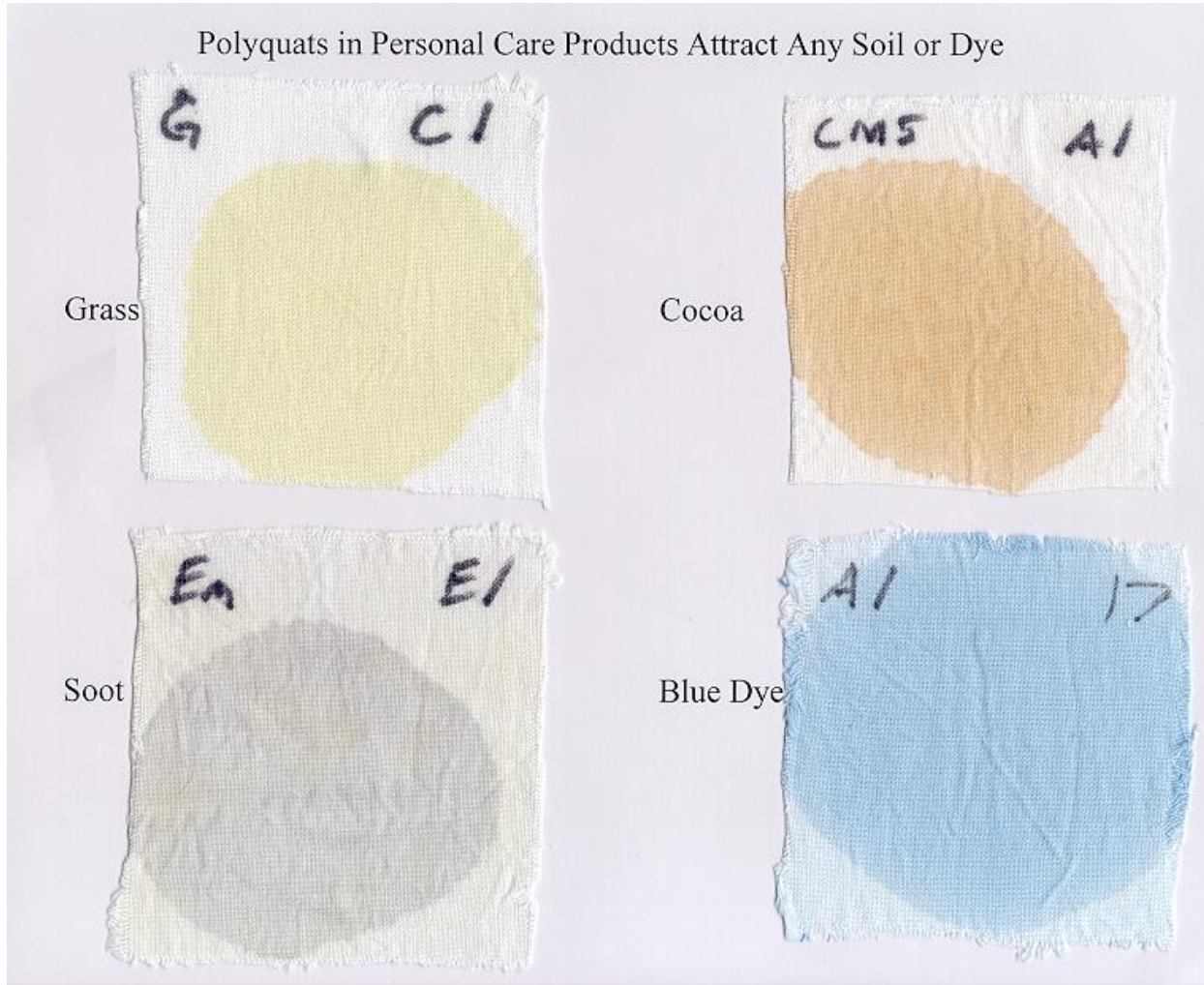
实验室重现投诉样本

将1g的洗手液涂抹于棉布然后风干
使用实验室级别立式去污机
分别用三种市售的洗涤剂进行洗涤
1g无机粘土作为污渍样本参与洗涤



实验室重现投诉样本

基本上所有类型的污渍都会被附着



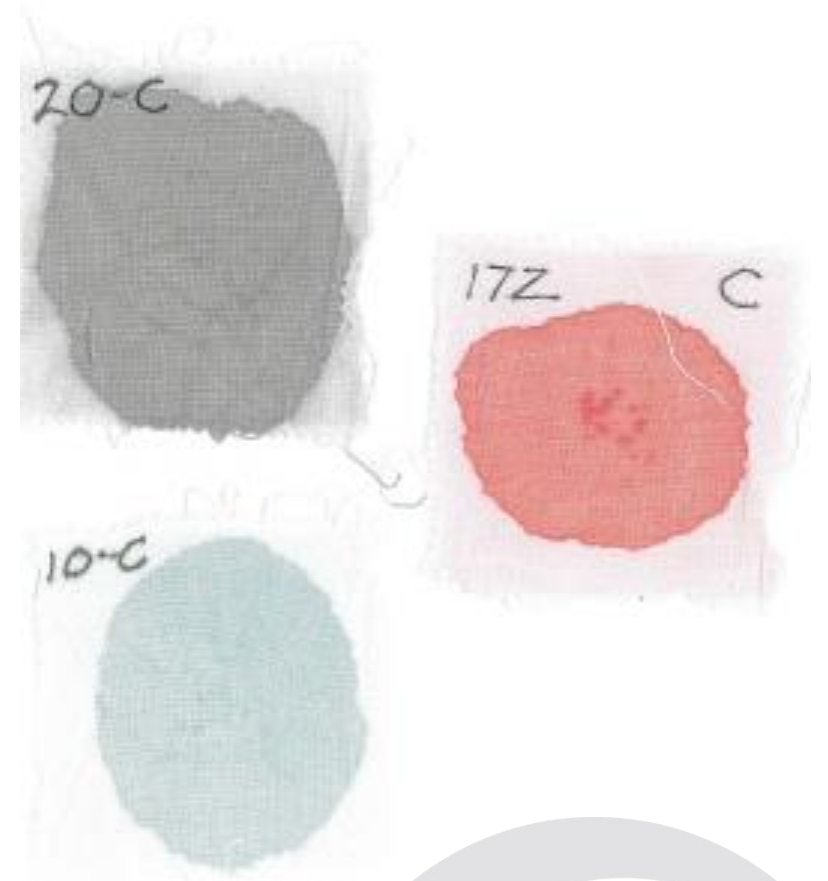
消费者实测验证

- 将1g定型摩丝涂抹在棉布样本上
- 让德国消费者带回家，每次洗涤时加一块样本
- 使用家用普通洗涤剂（不限品牌）
- 回收洗涤后的测试样品进行分析

结论：

季铵盐聚合物可以吸附几乎任何污渍和颜色
并使其与织物结合形成永久性污渍

German Consumer Test Swatches
Color Load





追根溯源



为什么仅在欧洲？



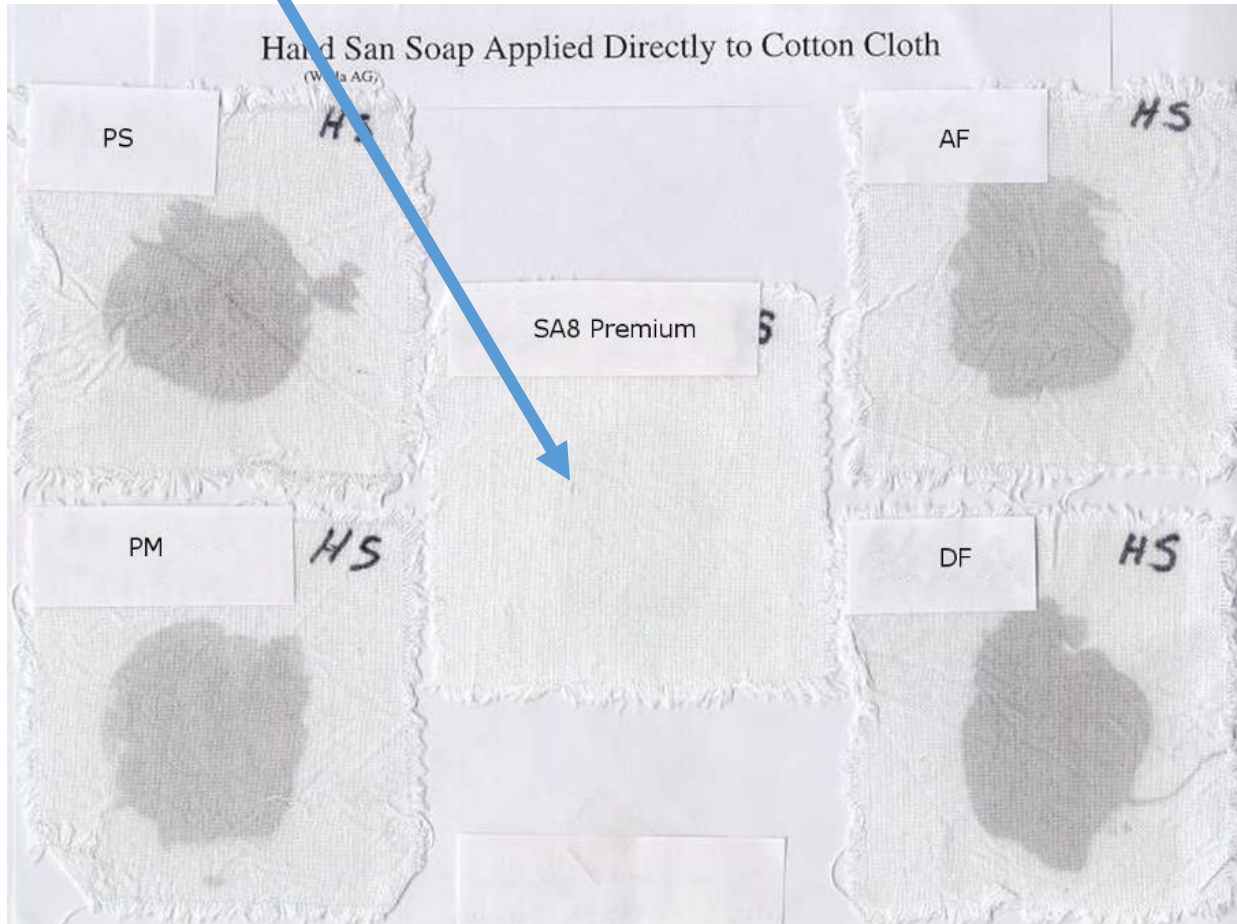
欧洲洗衣机
20 L Wash/4.5kg Fabric
Low Water Volume/High Soil



北美及亚洲洗衣机
50 – 70 L Wash/3 kg Fabric
High Water Volume/Low Soil



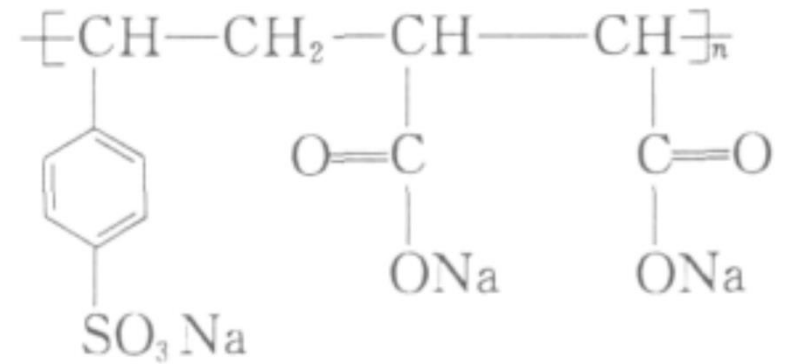
SSMA可以阻止污渍的附着与再沉积



SA8 Premium with SSMA

SSMA

磺化苯乙烯马来酸酐共聚物





解决方案



US006310031B1

(12) **United States Patent**
Sliva

(10) **Patent No.:** US 6,310,031 B1
(45) **Date of Patent:** Oct. 30, 2001

(54) **METHOD OF INHIBITING SOIL REDEPOSITION**

(75) **Inventor:** Philip G. Sliva, Rockford, MI (US)

(73) **Assignee:** Amway Corporation, Ada, MI (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/451,477

(22) **Filed:** Nov. 30, 1999

(51) **Int. Cl.⁷** C11D 3/37

(52) **U.S. Cl.** 510/528; 510/475

(58) **Field of Search** 510/475, 476, 510/528

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,663,053	5/1987	Geiger .	
4,698,161	10/1987	Hansen .	
4,711,740	* 12/1987	Carter et al.	252/174.24
4,941,946	7/1990	Henn et al. .	
5,196,139	* 3/1993	Moschner	252/186.25
5,429,765	7/1995	Flower .	
5,456,854	10/1995	Flower .	
5,489,397	* 2/1996	Bainbridge	252/174.24
5,496,486	3/1996	Staley .	
5,635,467	6/1997	Staley .	
5,925,610	* 7/1999	Austin et al.	510/361

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877076 A2 * 11/1998 (EP) .

935733	9/1963	(GB) .
2023121	12/1979	(GB) .
2138439	10/1984	(GB) .
62-141099	6/1987	(JP) .
WO 97/20024	6/1997	(WO) .

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Database WIP, Section CH, Week 198731, Derwent Publications Ltd., London, GB; Class A97, AN 1987-216333, XP002166009 & JP 62 141099 A (Lion Haijin KK) Jun. 24, 1987 (Jun. 24, 1987) abstract.

Chemical Abstracts, vol. 106, No. 24, Jun. 5, 1987 (Jun. 5, 1987); Columbus, Ohio, US; Abstract No. 19853a, Tamura C et al., "Studies on the Removal of Particulate Soil", p. 101; XP002166008 Abstract & Yukagaku, vol. 36, No. 3, 1987, pp. 192-199.

* cited by examiner

Primary Examiner—John Hardee

(74) *Attorney, Agent, or Firm*—Brinks Hofer Gilson & Lione; G. Peter Nichols

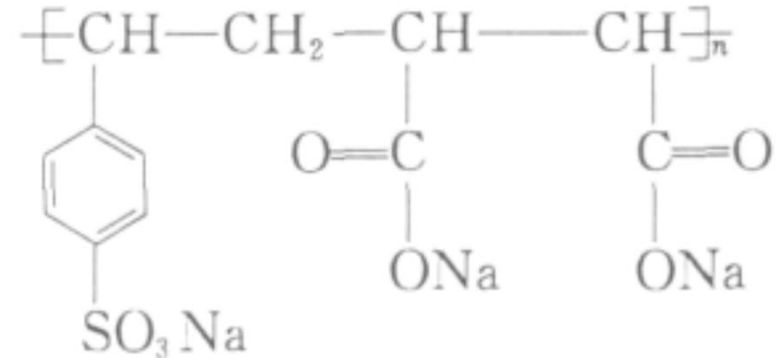
(57) **ABSTRACT**

A method of inhibiting soil redeposition on fabric stained by one or more quaternary compounds by providing a sulfonated material in an effective amount to a wash liquor. The sulfonated material includes water-soluble sulfonated polymers. Generally, the sulfonated material is incorporated with a laundry detergent to provide a use level of about 30 ppm to about 300 ppm in the wash liquor.

9 Claims, 3 Drawing Sheets

SSMA

磺化苯乙烯马来酸酐共聚物



Patent US 6,310,031





解决方案



US006310031B1

(12) **United States Patent**
Sliva

(10) **Patent No.:** **US 6,310,031 B1**
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5,489,397	* 2/1996	Bainbridge 252/174.24	
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9 Claims, 3 Drawing Sheets

SSMA

磺化苯乙烯马来酸酐共聚物

1. 基于苯乙稀合成
2. 磺化过程费用高且不安全
3. 不可生物降解

“Safer Choice”审核不通过

急需绿色替代方案

Patent US 6,310,031





长期解决方案



“新”聚合物的开发过程:

- 与供应商制定开发计划（始于2006年）
- 与供应商合作开发原料/安利实验室测试效果
- 2012年含有新原料的产品成功上市





长期解决方案



“新”淀粉基聚合物的特点:

1. 满足相同性能所用的剂量更少
2. 水溶剂工艺处理工艺，更安全，更高效
3. 原料成本降低使得供应商和安利获得双赢
4. 淀粉基构架可再生指数为45%
5. 新原料部分可生物降解
6. 满足“Safer Choice”要求





洗涤产品如何适应新洗涤模式？





Thanks !

