Polymer Dispersions

Product line

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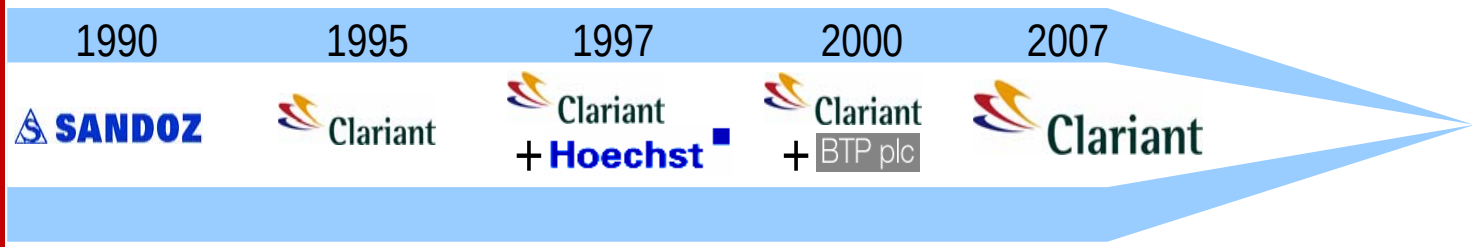
History of Clariant



- IPO in the summer of 1995 out of the Sandoz Chemicals Division
- Integration of the Hoechst specialty chemicals businesses in the summer of 1997

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Company structure

Textile, Leather & Paper Chemicals	Pigmentes & Additives	Functional Chemicals	Life Science Chemicals	Masterbatches
Textile Industry Leather Industry Paper & pulp Industry Polymer Dispersions	Coatings Industry Plastics Industry Printing Industry Specialized Industry	Detergent Industry Cosmetics Industry Oil and gas Industry Construction Industry Agro Industry Metal working Industry Mining Industry	Pharma Industry Agro Industry Manufacturers of coatings, plastics, flavor and aroma fragrances	Resin Producers Compounders Polymer Converters Manufacturers of industrial & consumer goods: carpets, textiles, cosmetics, detergents, food packaging, toys, cars, appliances

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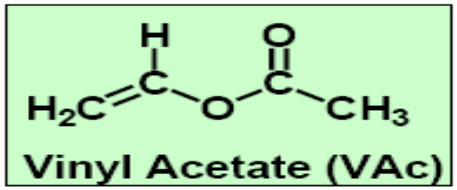
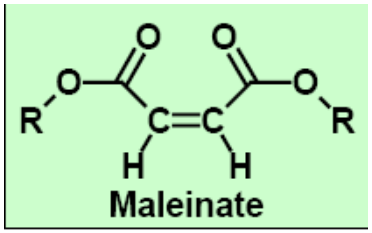
Clariant Emulsion History
科莱恩乳液发展史

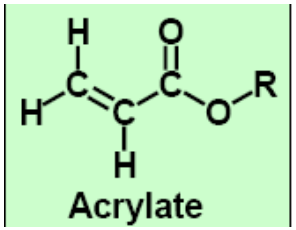
1912 赫斯特注册并开始生产乳液 **Mowilith®**

1934 赫斯特是第一个工业化生产聚醋酸乙烯乳液的公司

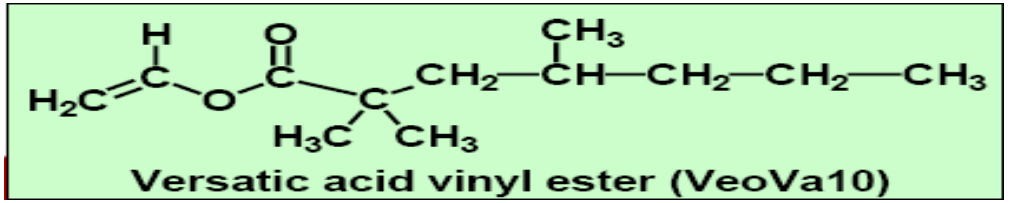


1950 赫斯特是第一个工业化生产聚醋酸乙烯分别和顺丁烯二酸酐及丙烯酸酯共聚乳液的公司





1960 赫斯特是第一个工业化生产醋叔乳液的公司



Clariant Polymer Dispersions production sites in the world （19 Plants)

*3rd Party manufacturing for us

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Clariant Polymer Dispersions in Asia
Some Facts and Figures
科莱恩乳液在亚洲

1965 Start selling emulsions in Asia (ex. Europe)
开始在亚洲销售Mowilith® 乳液(欧洲进口)

1973 Start producing emulsions in Asia (Indonesia)
开始在亚洲生产Mowilith®乳液（印尼）

2004 Start producing emulsions in China (leather)
开始在中国生产乳液（供皮革用）

2005 Start producing Mowilith® emulsions for Coatings in China
开始在中国生产涂料用乳液

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Summary 总结

- Clariant has a long history of producing emulsions

  科莱恩有悠久的乳液生产历史

- Clariant has a strong position as supplier of emulsions to the coating industsry in countries where we have production capacity but not yet in China

  作为涂料工业用乳液供应商，科莱恩在很多国家是涂料厂商的最佳合作伙伴。

  → Actions required for China

  在中国，我们将要推广的产品会有以下部分：

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Next Presentation……
接下来的介绍是……

- VeoVa全能型乳液

  Mowilith® VeoVa universal emulsion

- 水性木器漆用乳液

  Mowilith® emulsion for water-based wood coatings

- 水性防火涂料用乳液

  Mowilith® emulsion for fire retardant coatings

- 弹性涂料用乳液

  Mowilith® emulsion for elastomeric wall coatings

- 用于建筑领域的其他乳液

  Mowilith® emulsion for construction

Mowilith DM 230

Polymer Dispersions
May 25th, 2007

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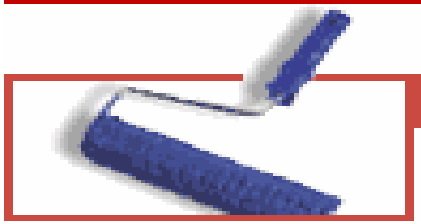
Superior flame retardancy means enhanced protection

for people, property and the environment



Mowilith® emulsions

for the paint industries

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内容 Contents

- 防火涂料的定义 What's the fire retardant coating
- 防火涂料的分类 Type of fire retardant coating
- 防火涂料的组成 Components of fire retardant coating
- 防火涂料的阻燃原理 Principle of fire retardant
- Mowilith DM 230 介绍 What's DM 230

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一、防火涂料的定义

防火涂料是指涂覆于

①可燃性基材表面，能降低被涂材料的可燃性、阻滞火灾的迅速蔓延，或

②结构材料表面，用于提高构件耐火极限的**物质**

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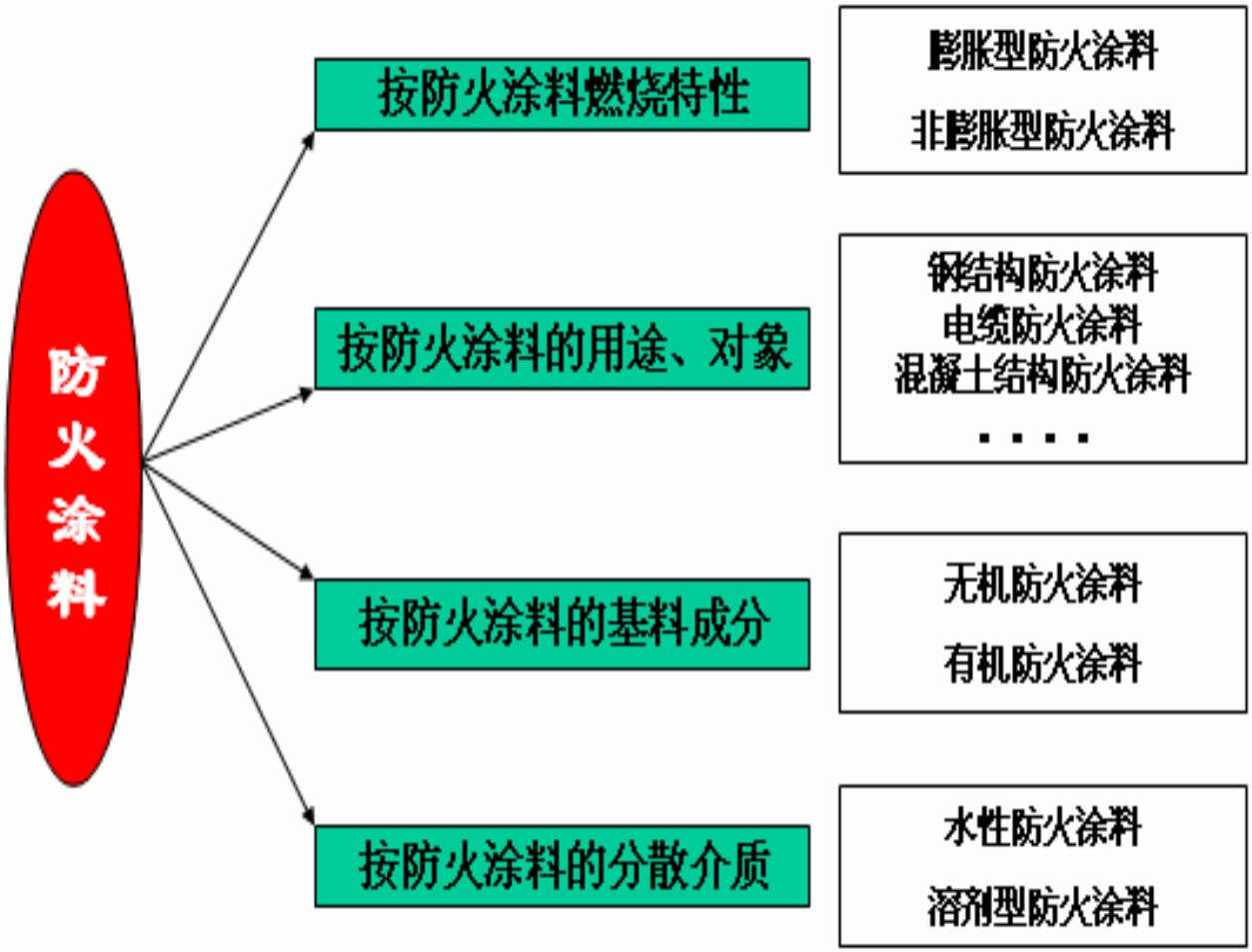
二、防火涂料分类



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三、防火涂料的组成

- 基料
- 阻燃剂
- 颜填料
- 助剂
- 分散介质

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防火涂料的组成--基料

- 组成涂料的基础、骨架，对性能起决定作用
- 包括无机成膜物和有机成膜物
- 无机成膜物—硅酸盐、硅溶胶、磷酸盐
- 有机成膜物—过氯乙烯、有机硅树脂、氯化橡胶、Mowilith DM 230

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防火涂料的组成--阻燃剂

- 起防火作用的关键组分
- 吸收大量的热
- 释放出不燃性气体
- 形成隔热隔氧，热导率很低的膨胀碳层

- 有卤系阻燃剂（氯化石蜡）、磷系（磷酸酯）、卤-磷系、无机系（氢氧化铝）、膨胀型阻燃剂等
- 膨胀型阻燃剂由脱水剂（聚磷酸铵）、成碳剂（季戊四醇）、发泡剂（三聚氰胺）组成

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防火涂料的组成--颜填料

- 改善涂料的物理性能（遮盖、硬度等）、 化学性能（耐酸碱、耐水）

- 钛白粉、硫酸钡

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防火涂料的组成--助剂

- 改善涂料的柔韧性、附着力、强度、稳定性等性能
- 是辅助成分，用量少、作用大
- 增加强度，减少开裂—玻璃纤维
- 增加施工厚度，防流挂—增稠剂
- 柔韧性—DOP等增塑剂
- 热稳定剂、抗老化剂、表面活性剂

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Exactly your chemistry.

防火涂料的组成--分散介质

- 有利于各组分的分散，便于施工
- 水性—水
- 溶剂型—有机溶剂（二甲苯、200#）

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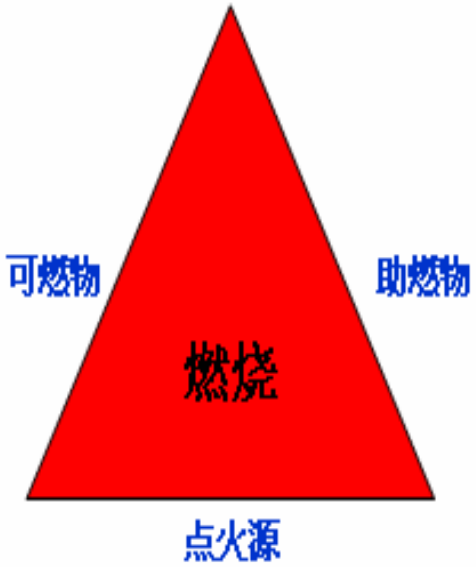
四、防火涂料的防火阻燃原理

- 本身不燃或难燃，使可燃基材不直接与火接触
- 形成隔热层，阻止热量的传递
- 遇火受热分解出不燃性的惰性气体冲淡易燃气体和氧气 或形成隔氧层
- 涂料分解吸热，降低基材温度，延缓温度上升



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五、*About Mowilith DM 230*

- Based on vinyl acetate and VeoVa monomer 醋叔乳液
- Plasticizer-free dispersion 不含增塑剂
- Solid content: approx. 50% 固含量约50%
- MFFT: approx. 14°C 最低成膜温度约14度
- Tg: approx. 24°C 玻璃化温度24度
- Usage: 用途

  fire retarding paints 防火涂料

  mid sheen/semi gloss paints 有光漆

  interior/exterior paints 内外墙涂料

  plasters 灰浆

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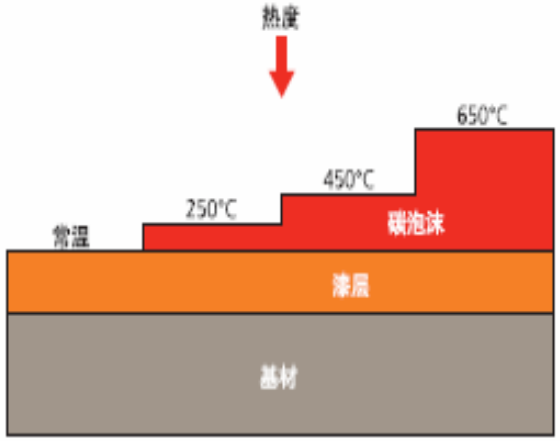
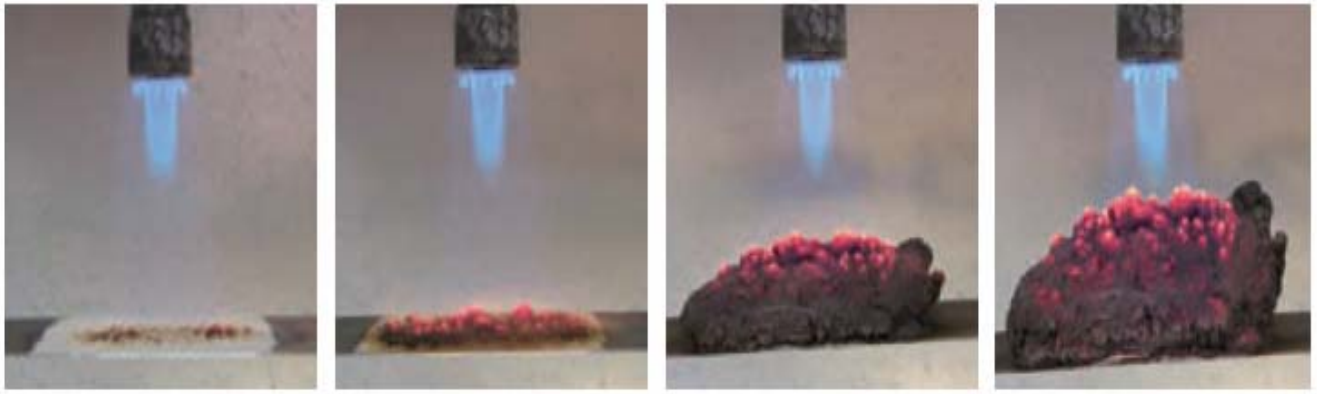
加厚的焦化层提高了耐火能力

当大约 1 毫米厚的膨胀型涂料层暴露在不低于 250°C 的高温中时，它可以膨胀 10 到 100 倍，形成一个泡沫焦化层，使底层基材绝热。



膨胀型涂料的热效应

1. Mowilith® DM230 分散剂 / 粘合剂融化，以允许在柔软基质中发生进一步的化学反应。
2. Exolit® AP 422 酸供体分解生成多聚磷酸。
3. 多聚磷酸与 Charmor® 碳供体反应生成多聚磷酸酯。
4. 多聚磷酸酯分解生成可发泡的碳基质。
5. 三聚氰胺发泡剂放出气体，使碳基质产生泡沫，泡沫硬化后生成绝热性的焦化层附着于基材表面。



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US005749948A

United States Patent [19]

Scholz et al.

[11] Patent Number: 5,749,948

[45] Date of Patent: May 12, 1998

The following components were introduced in succession into a stirred vessel fitted with a dissolver disc:

20.8% by weight of water

3% by weight of ®Tylose

0.2% by weight of ®Lopon 890

4% by weight of titanium dioxide

12% by weight of pentaerythritol

24% by weight of ammonium polyphosphate

14% by weight of melamine

20% by weight of ®Mowilith DM 230

2% by weight of chlorinated paraffin 50, liquid.

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美国专利防火涂料配方，

专利号：5749948，日期：1998年5月12日

原料名称	重量比（%）
水	20.80
Tylose 纤维素	3.00
Lopon 890	0.20
钛白粉	4.00
季戊四醇	12.00
聚磷酸铵	24.00
三聚氰胺	14.00
Mowilith DM 230	20.00
50#氯化石蜡	2.00

100.00

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Exactly your chemistry.

The resulting coating composition was roller-coated onto one side of a steel panel (St 37) of dimensions 280×280×6 mm^3. After drying for one day at room temperature coating composition was again applied. The weight of the applied composition was now 2 kg/m^2. Finally, the coated panel was dried in air at 20° C. for 2 weeks.

The surface of the coating was smooth and free from cracks.

The fire testing of the coated panel according to DIN 4102 gave the fire resistance class F 60.

根据上述配方制漆，然后滚涂于280*280*6mm的钢板上，室温干燥一天后重涂，直到达到2kg/m^2,涂好的钢板在20度下保养2周。漆膜表面平整光滑无开裂。

按DIN 4102进行耐火试验，可达F60等级。

Clariant

Exactly your chemistry.

The same coating composition as in Example 1 was prepared, but the film-forming binder Mowilith DM 230 was replaced by ®Impranil DLP.

The surface of the panel provided with this coating composition was smooth and free from cracks.

The fire testing of the coated panel according to DIN 4102 gave the fire resistance class F 30.

同样的配方，成膜物用Impranil DLP 代替 Mowilith DM 230，耐火试验的等级是F30.

Clariant

Exactly your chemistry.

The same coating composition as in Example 1 was prepared, but without the chlorinated paraffin component. In addition, the film-forming binder Mowilith DM 230 (vinyl acetate-vinyl ester copolymer from Hoechst AG, Frankfurt) was replaced by ®Impranil DLP (anionic, aliphatic polyester-polyurethane dispersion from Bayer AG, Leverkusen).

The surface of the panel provided with this coating composition was rough and traversed by fine cracks.

The fire testing of the coated panel according to DIN 4102 did not meet the requirements of fire resistance class F 30.

若减去上述配方中的氯化石蜡，同时用Impranil DLP 代替 Mowilith DM 230,制板后漆膜表面粗糙且有细小裂纹，耐火等级是F30

Clariant

Exactly your chemistry.

The same coating composition as in Example 1 was prepared. but the film-forming binder Mowilith DM 230 was replaced by ®Mowilith DM 60 (styrene-acrylate copolymer from Hoechst AG. Frankfurt).

The surface of the panel provided with this coating composition was smooth and free from cracks.

The fire testing of the coated panel according to DIN 4102 gave the fire resistance class F 30.

若用苯丙乳液Mowilith DM 60 代替Mowilith DM 230,
漆膜表面平整光滑无裂纹，耐火等级F 30

Clariant

Exactly your chemistry.

A coating composition analogous to that in Example 1 was prepared, with the film-forming binder Mowilith DM 230 being replaced by ®Mowilith DC (homopolymer based on vinyl acetate, from Hoechst AG, Frankfurt) and the chlorinated paraffin being replaced by tris(2-chloroethyl) phosphate.

The surface of the panel provided with this coating composition was smooth and free from cracks.

The fire testing of the coated panel according to DIN 4102 gave the fire resistance class F 30.

若用Mowilith DC 代替Mowilith DM 230, 同时用三（2-氯乙烯）磷酸酯代替氯化石蜡，耐火等级是F 30

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从美国专利5749948的研究中可以看出，Mowilith DM 230 作为水性膨胀型防火涂料的成膜基料，成膜性好，表面平整光滑无裂纹，耐火等级可达德国标准DIN 4102中的F 60等级。

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Exactly your chemistry.

Clariant

[Exactly your chemistry]

Polymer Dispersions
May 25th, 2007