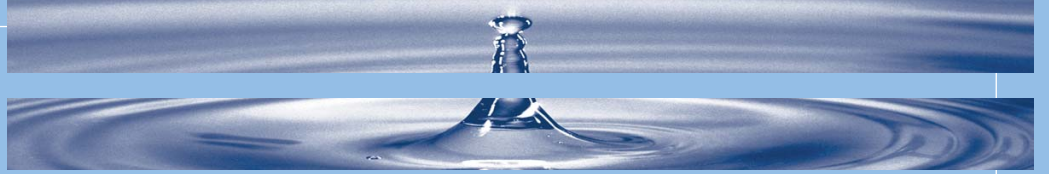


## PVC SAFETY AND ENVIRONMENT



**FLAG**

YOUR ROOFING AND WATERPROOFING PARTNER

# Safety & Environment

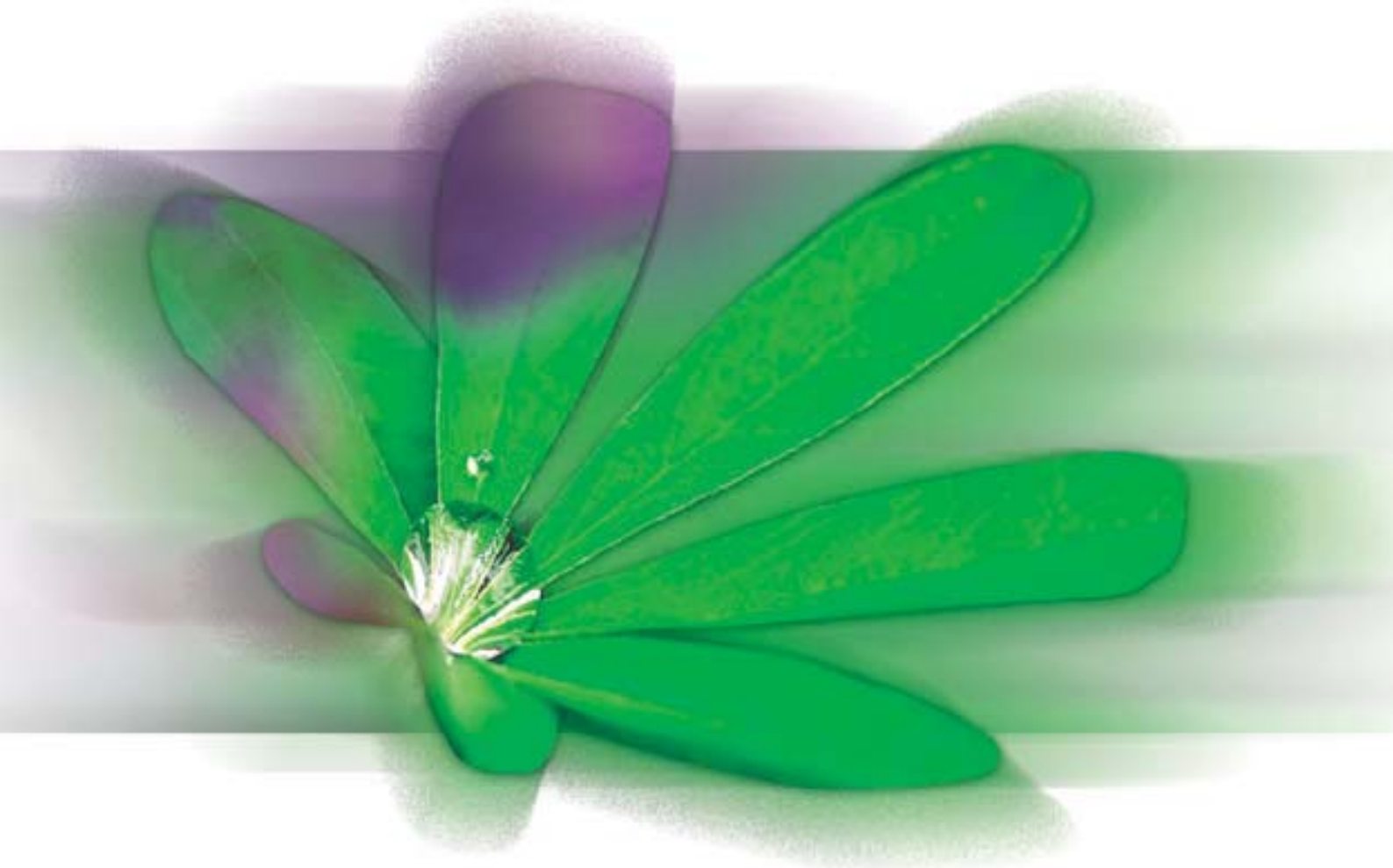
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## **FOREWORD**

In the past industrial design was principally market driven.

Today, we also consider the mode of manufacture, from first concept to end product, that product's use and even the issues of waste and recycling.

This new way of thinking about industrial projects respects the environmental and ecological sensitivity that is now evident throughout the world.



## THE PRODUCTION OF PVC

Polyvinyl chloride (PVC) was discovered by chance in 1835 by the French research chemist Regnault.

Its first significant application was in the 1930's when it was used for pipes in buildings but it wasn't fully developed until after World War II.

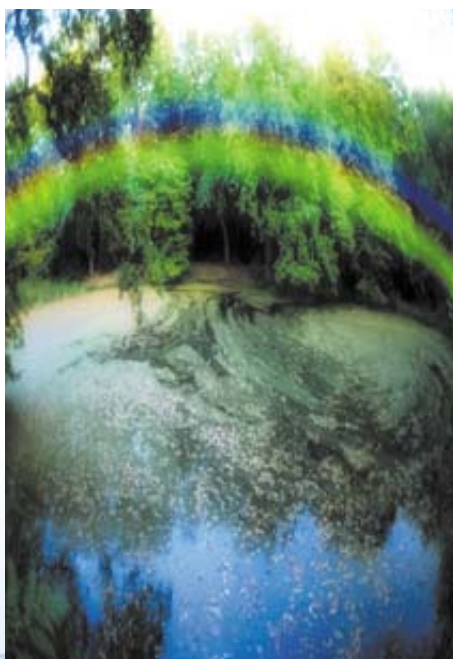
Today PVC is manufactured by large, multinational chemical companies all over the world.

During recent decades much research has been carried out into manufacturing technology, concentrating on environmental impact and worker safety.

Today, all modern PVC production plant use closed and integrated-cycle, automated production systems that concentrate on recycling by-products and reducing emissions.



## FLAGON PVC liners



### PVC PROCESSING

The main characteristic of PVC is its versatility, allowing it to be used for a variety of applications.

Particular additives can create different characteristics.

This process is carried out in closed mixers to avoid any kind of chemical reaction.

During mixing, additives are permanently fused to the basic compounds.

The result is a homogenous powder or granules ready for the next stage of manufacture into the required product.

All stages of dosing and transport of polymer and/or additives are carried out in controlled conditions.

Any residue in filters is returned to the manufacturing process.

The price/performance ratio of PVC, compared to alternative products, makes its use extremely advantageous.

Analysis of cost to the environment has proved that PVC is equal to, or better, than products it has replaced, or its current competitors.

### PVC WASTE

In Italy the following methods of disposal are used for plastic products:

1. **Monitored landfills**
2. **Incineration**
3. **Recycling**

*Here is a description of the behaviour of PVC in each case:*

#### 1. **Monitored landfills**

Thanks to the perfect stability and inertia of the material, PVC waste does not cause any problems.

Aerobic and anaerobic bacteria existing in the ground, destroy any plasticisers in the product but they do not attack inert polymeric fraction.

## **2. Incineration**

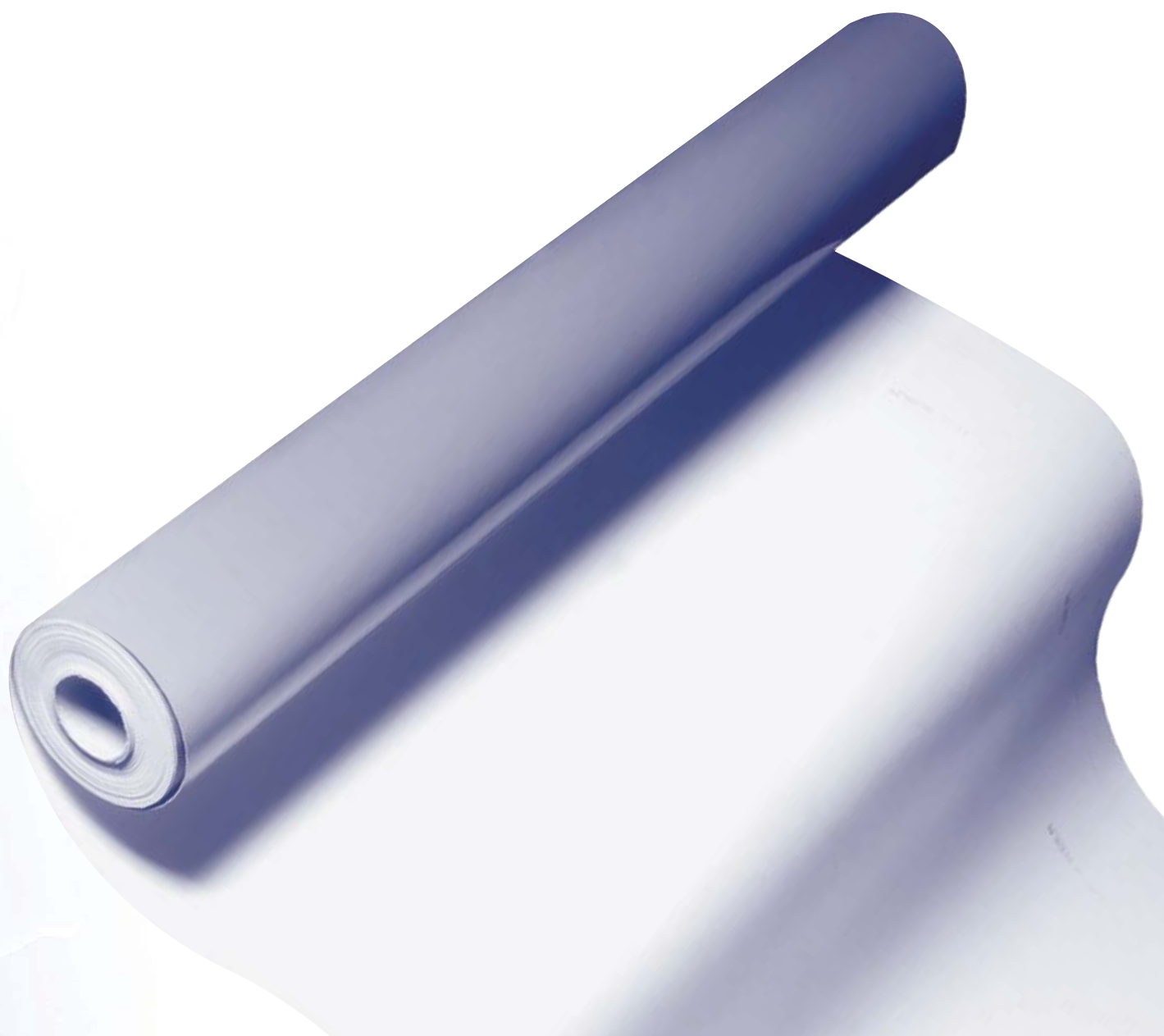
New laws decree that incinerators must have active systems to recover electric or thermal energy using the calorific power of waste. PVC represents only a small proportion of waste but helps contribute to such energy production.

Its calorific power is located between paper and wood.

There have been concerns that PVC might cause dioxins during incineration. Several test reports have shown that dioxins are caused by combustion of organic materials together with chlorine.

The total chlorine value in RSU averages 1%, principally caused by materials containing salt or chlorine, as in organic waste, paper, wood etc.

Modern RSU incinerators burn at temperatures not lower than 950°C and are equipped with a secure post-combustion room guaranteeing compliance with laws relating to the emission of atmospheric pollution.





### **3. Recycling**

Technically, PVC is one of the most easily recycled plastic products.

Mechanical recycling is easy and does not cause any environmental impact. Once separated from other materials, PVC is washed to clean it of any trace of other waste or soil, and crushed into flakes.

At this point, recycled PVC can be re-used keeping a large part of its physical-mechanical characteristics unchanged.

After the addition of new ingredients it can be returned to the manufacturing process described above.

During the manufacture of Flag products all waste matter from cutting, change in colour etc., is crushed before being returned to the manufacturing process. This avoids accumulation of waste and contributes to keeping the consumption of raw materials to a minimum.

PVC manufacturers, PVC recycling and manufacturing companies, PVC users and Standard Institutions are collaborating to draft standards to regulate recycling of products at the end of their life.

In the specific case of waterproofing membranes, the recycled material should be reused, as is already happening, to manufacture separating and protective layers.

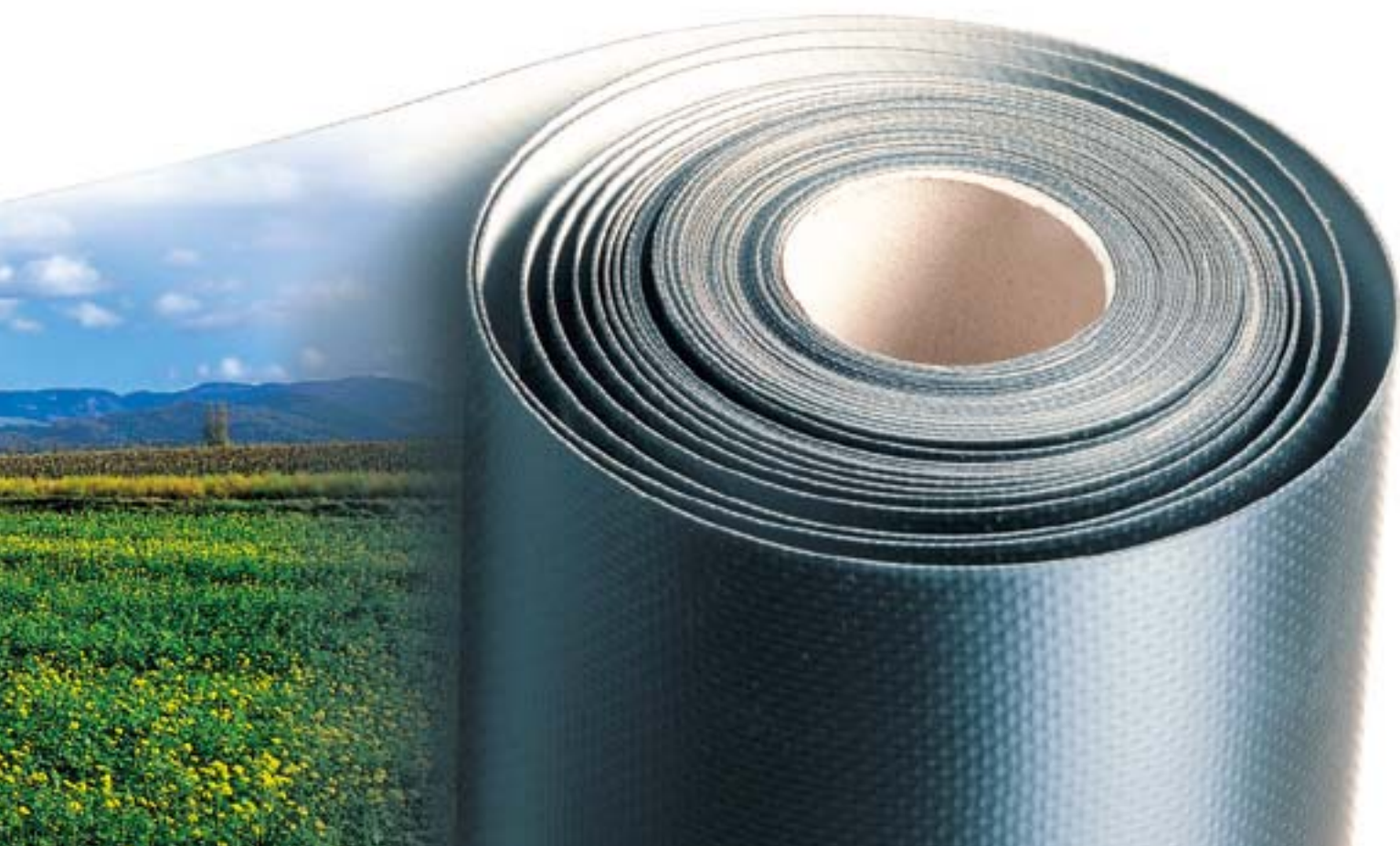


## CONCLUSIONS

The choice and evaluation of manufacturing processes or materials must be based on the results of comparative tests. Each aspect must be examined with its impact on the environment in mind.

PVC has been thoroughly studied and tested for many years. Doubts about its safety have been dismissed allowing it to be used without risk.

The general judgement about PVC membranes and the environment is, therefore, positive.



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