



SOLVAY

asking more from chemistry®

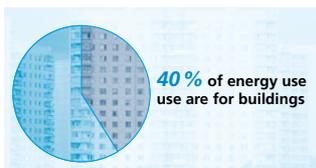


SOLKANE®



HFC-blown PUR Thermal
An Eco-Efficient High-Performance Solution for
Renovation of Domestic and Commercial Buildings

The Importance of Buildings for Climate Protection



Buildings account for more than 40% of the energy use across the EU-25. As yet, energy consumption and the corresponding carbon dioxide (CO₂) emissions continue to rise. Governments address this problem, not least due to their commitment under the Kyoto Protocol. Adopting energy efficiency measures for buildings could allow for CO₂ emission reductions in the order of 15–25%.

Why Focus on Renovation?



New construction offers the chance to achieve energy efficiency in buildings. But generally, new buildings only meet the demand for growth, whereas existing buildings, although they represent a much greater energy saving potential, remain sub-standard for very long periods.

Therefore, substantial emission reductions are only possible by giving a strong priority to the renovation of the existing building stock.

European Directive on Energy Performance in Buildings

The new EU Energy Performance in Buildings Directive (EPBD) will from 2006 stimulate the renovation of many non-domestic buildings. The EPBD mandates the upgrade of the energy performance of buildings with floor space of more than 1,000 m² when wider renovation takes place (Article 6).

This rule depends on finding “technically, functionally and economically feasible” solutions. Hence, cost effectiveness will be a decisive factor in any governmental strategy to promote improved energy efficiency in buildings.

What Are the Solutions?

Future building renovation programmes are likely to be selected on the basis of their cost effectiveness, with governments seeking to optimise emission savings under a constrained budget. Evidence from many studies shows that the upgrade of thermal insulation makes a significant and important contribution to overall renovation programmes. Yet, the first cost of thermal insulation measures will often keep investors from tackling these otherwise attractive measures.

The following case study from Spain demonstrates that spray foam insulation of roofs has both economic and environmental advantages: it is an eco-efficient solution.

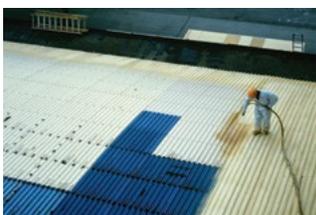
Case Study Spain



The Spanish Government decided to renovate 5% of its housing stock – more than 300,000 dwellings in total – between 2005 and 2012. Many of these are flat-roofed town houses. The budget available for wall or roof renovation is close to € 3 billion.

In this constant budget scenario, the number of dwellings renovated depends on the cost of renovation. A solution which allows for renovating more dwellings saves more CO₂ emissions and thus wins the day.

HFC-blown PUR Spray Foam: a Unique Solution



Rigid polyurethane (PUR) foams blown with hydrofluorocarbons (HFC) are a unique high-performance solution to this challenge.

One clear economic benefit of PUR spray-based renovation strategy is that the existing flat-roof cover does not need to be stripped off. Basically, PUR spray foam can be applied on top of the existing roof with minimal preparation. This is a substantial simplification in logistics resulting in saved labour costs. Only PUR spray foam can be applied in this way. Using HFCs as high-performance blowing agents optimises the thermal insulation performance. This allows for flexible and cost-effective solutions like spray foam or cavity wall injection.

What about Alternatives?

Other blowing agents may not meet requirements concerning thermal insulation performance or process safety. Especially process safety is important when applying renovation techniques directly on site. HFCs play a key role in enabling these advanced techniques.

SOLKANE® 365 - A Multi-Faced Blowing Agent for Plastic Foams

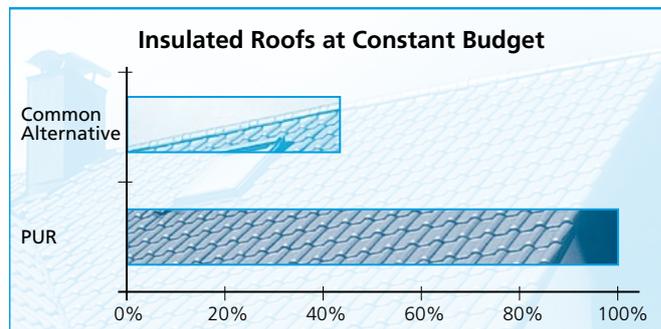
*members of IPUR
**member of IVPU

Solvay Fluor has developed the hydrofluorocarbon (HFC) SOLKANE® 365mfc to replace HCFC-141b as a blowing agent for PUR foams. Unlike hydrochlorofluorocarbons (HCFC), SOLKANE® 365mfc does not affect the ozone layer. Together with their partners – ATEPA (Asociación Técnica del Poliuretano Aplicado)*, Elastogran Spain (BASF Group), and Synthesia Española, S.A.* – Solvay Fluor** had commissioned a life cycle assessment (LCA) study. This independently verified LCA study demonstrated that, looking at the full picture, the high-performance blowing agent SOLKANE® 365mfc in PUR foam sprays is an environmentally favourable solution. By saving more energy than alternatives, even its overall climate performance can be advantageous.

What about costs?

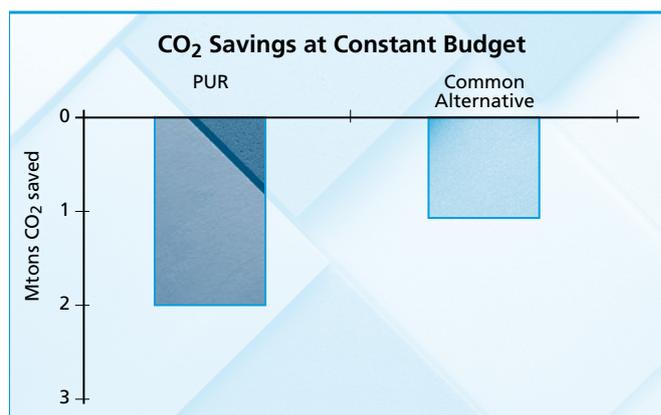
The total costs of applying PUR spray foam insulation to a flat roof are less than half of an alternative. Even though some other insulation material may be cheaper, their necessity to remove the previous roof cover is the primary cost driver.

Additionally, as spray foam avoids a longer-term renovation period with possible restrictions on building use, this can further tip the balance in favour of the PUR solution. High-performance thermal insulation using SOLKANE® 365mfc-blown PUR sprays can provide substantial cost savings for heating and cooling of buildings. Therefore amortisation periods are well acceptable.



How does the climate performance of HFC-blown PUR foams compare?

Aside from high-performance solutions like PUR spray foam, completely different solutions might be considered as well. However, another independent study showed that, even taking blowing agent emissions into account, due to the higher number of roofs insulated at the given budget, the SOLKANE® 365mfc-blown PUR spray foam solution allows for greater CO₂ emission savings than common alternatives.



Conclusions

- Renovation of the existing building stock is among the most important ways to cut energy demand and CO₂ emissions in Europe. Consequently, the EU Energy performance in Buildings Directive (EPBD) promotes the upgrade of the energy performance of buildings.
- Cost-effectiveness is the key success factor of renovation measures. HFC-based PUR spray foam systems are particularly flexible, provide cost-effective solutions, and ensure process safety on site. This allows for more buildings to be insulated, more energy to be saved, and more CO₂ emissions to be avoided.
- Since industry makes such cost-effective solutions available, the first-cost barrier that may still cause investors to hesitate could easily be overcome if governments provided further incentives, e.g. energy efficiency services, tax breaks or grants.



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