

# Application of SSbD for Construction Chemicals

European Federation for Construction Chemicals, EFCC

## Opportunities & Challenges

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# SSbD for Construction materials

## 1. Introduction

Please allow me to shortly introduce myself and EFCC. My name is Johan Breukelaar, and I am the Director General of the European Federation for Construction Chemicals, EFCC.

I am delighted to speak to you on this occasion, just three weeks ago I had the pleasure to be in Athens on the occasion of the CEFIC General Assembly.

As some of you may know, EFCC represents the Construction Value Chain in the **IRISS project**, a project sponsored by the European Commission.

We have evaluated the application of the SSbD concept for construction chemicals and covered three different sub-value chains:

1. Concrete admixtures
2. Polyurethanes (insulation materials)
3. Carbon sequestration of concrete

Our initial focus has been on a key type of construction chemicals, i.e. **concrete admixtures**. In addition, we have also evaluated the SSbD criteria for **PolyUrethanes (PU)** in their application as insulation materials in construction. Lately, we have evaluated SSbD criteria for **carbon sequestration** using construction chemicals.

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## 2. Concrete admixtures

The evaluation of SSbD for the use of concrete admixtures as *superplasticizers*, has shown that concrete admixtures play an important role in *reducing energy* (and water) use in the application of concrete. Thus, they contribute significant savings in *GHG emissions* in the construction sector in Europe.

We have studied four different types of concrete admixtures, including concrete admixtures using very hazardous chemicals as raw materials, such as melamine and formaldehyde.

A new type of concrete admixtures, based on polycarboxylates (PCE), have been developed as an alternative, that also offers significant savings of GHG emissions and reduction of water used.

## 3. Polyurethanes

Another construction value chain is that of chemicals-based insulation materials and in particular polystyrene (PS) and *polyurethane (PU)* based insulation materials. It goes without saying that both materials result in the reduction of GHG emissions.

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## 3. Polyurethanes (continued)

The application of PU based insulation materials has its challenges in particular through the use of di-isocyanates as raw materials. Di-isocyanates attract severe classification and labelling in the EU. As their application is typically by professional users, the entire PU value chain has been involved in the development of a ***comprehensive training package*** to allow their safe use by professionals in the European Union.

## 4. Carbon sequestration

The current situation in Europe is that large volumes of concrete demolition waste are generated every year. Most of this demolition waste ends up in landfill. Instead, this waste can now be recycled instead.

Particularly in urban areas, recycling demolition waste is important, as this is where most of the concrete waste now accumulates. Construction chemicals companies in Europe have recently developed new recycling technology by chemo-mechanical treatment of concrete demolition waste.

This technology involves the **carbonation** of the cementitious matrix that is softened and removed upon attrition. Thus, freshly exposed surfaces are obtained, that allow further carbonation until aggregates free from cementitious material are obtained.

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## 4. Carbon sequestration (continued)

Through this process concrete demolition waste can be separated into secondary aggregates for recycling at a ***quality level of the primary material*** and a powdery material that can be used as secondary raw materials in a broad range of applications.

## 5. Conclusions

In conclusion, although SSbD is a relatively new concept, the construction chemicals industry has already taken into account key sustainability aspects of construction.

### In summary:

**Research & Innovation** - Ongoing R&I towards SSbD: development of substitutes for melamine-based or formaldehyde-based concrete admixtures, PCE based admixtures.

**Health & Safety** - Safe handling of restricted substances used as raw materials for PU based insulation through a comprehensive training package for professional users.

**Environment** – reduction of energy use and GHG emissions, reduction of water use.

**Circular economy** – recycling AND reuse of concrete, carbon sequestration.

**Standardisation** – CEN/TC 350 'Sustainability of Construction Works' and CEN/TC 350-SC1 'Circular Economy in the Construction Sector'