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EU-compliant integral foam systems with HFC-free foaming agents by Zelu

Murr, Germany. Integral foam systems are a must for many applications – in the automotive and furniture industries, for example – on account of their enormous adaptability. However, as of 2023, EU Regulation 517/2014 on the reduction of industrial emissions will ban hydrofluorocarbons, the foaming agent currently employed for the majority of integral foams. ZELU CHEMIE's various products based on alternative agents have proved an effective answer to this problem in practice. These integral foam systems not only enable seamless integration into existing production processes and facilities; they also open the door to new potential applications.

Foaming agents are essential in order to create polymer foams and hence play a key role when processing integral foam systems. However, as of 1 January 2023, EU Regulation 517/2014 will prohibit the use of fluorinated greenhouse gases in the production of polyurethane – including foaming agents belonging to the family of hydrofluorocarbons (HFCs). The reason for this ban on HFCs is their high global warming potential, in other words the impact on global warming compared to the equivalent amount of carbon dioxide. Producers will consequently be forced to choose alternative foaming agents and, where necessary, modify their existing facilities.

Zelu already has a broad portfolio of practice-proven integral foam systems with HFC-free foaming agents and continuously develops new solutions. These agents are based on water, hydrofluoroolefins (HFOs) or pentane – in each case solutions that, to all intents and purposes, are classed as nearly environmentally safe. The three alternatives simultaneously allow an optimum solution to be found, whatever the end use and the production conditions.

Selection criteria for alternative foaming agents

Pentane represents a viable solution for serial production on a large scale. It demands substantial investments both in facilities meeting special fire prevention requirements and in suitable safety devices, yet on the other hand the foaming agent permits the desired skin thickness to be achieved extremely precisely over the cellular foam core. Moreover, the costs incurred subsequently for material are relatively low.

Water is the simplest foaming agent to use when only small batches are manufactured. The Zelu systems compensate for the slightly thinner skin here with good handling and a lower price. HFO-based foaming

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agents are an option for applications where a thicker skin is called for but a pentane system would be uneconomical. The technical requirements during processing are similar to those for the HFCs used to date and the systems can therefore be processed in an existing facility without any problem.

Zelu's pentane, water and HFO-based integral foam systems are already employed in many different branches of industry – including automotive and transportation, industry and construction, furniture and sports and leisure – where they enable customised solutions such as those described in the following examples.

HFO-based integral foam for the medical sector

Zelupur SI 9652 – the newest product – is an HFO-based solution for special, wipeable pillows used in physiotherapy. This Zelu foam system combines low density of 150 kg/m³ with a low Shore 00 hardness of 20 to 65, meaning it is regarded as a flexible foam. Yet the closed integral skin has several advantages compared to flexible foam, for example it is very easy to wipe clean without any cleaning agent infiltrating into the foam. At the same time, the skin has a pleasant feel on the parts of the body being treated. What's more, the addition of a biocide to Zelupur SI 9652 prevents bacterial contamination in future use.

Solutions for the automotive industry and agriculture

Zelu launched Zelupur SF 9619 as one of the first ever water-blown integral foam systems in the market back in 2017 – since when it has been utilised for covers of all kinds in engine compartments. This product is just as resistant to common chemical substances as the HFC system employed previously. Zelu also offers a new pentane-based foam under the name Zelupur SI 9644 for high manufacturing volumes.

A water-blown system known as Zelupur SF 9610 is likewise well-established as a standard feature in agricultural vehicles. It provides floor mats with a durable and resilient skin and its resistance to dust, clay and relevant cleaning agents is every bit as good as that of comparable HFC systems.

About Zelu

Zelu is a medium-sized, international chemicals company based in Germany. The company develops and manufactures tailor-made polyurethane foam systems and adhesives of the very highest quality. Its know-how is based on 130 years of experience in materials science and development. This enables us to find the perfect solution for every application – today and in the future.

Press information

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