



CASE STUDY

**RELIABLE ELASTOMERS
IN FIRE PROTECTION
TECHNOLOGY**

**HIGHEST RESISTANCE
FOR A LIFE-SAVING
EXTINGUISHING SYSTEM**



KUNDENPROFIL

Company:

protecfire GmbH

Headquarters:

Lübeck, Germany

Size:

11-50 employees

Year of foundation:

2002

Industry:

Fire protection

Products:

Various extinguishing systems for vehicle construction, wind power plants, commercial kitchens, electr. systems, etc.

CHALLENGE

Temperature resistance
from -30 °C to +80 °C

Thin and consistent wall thickness
throughout the entire product

Maintenance-free
and reliable use over 10 years



SOLUTION

Manufacturing within the JÄGER Group

Precise adjustments
of the manufacturing process

Extensive tests to verify product properties



RESULT

All product tests are successfully completed

Tightest tolerances
and product properties are realized

More effective extinguishing behavior
than initially calculated



CHALLENGE

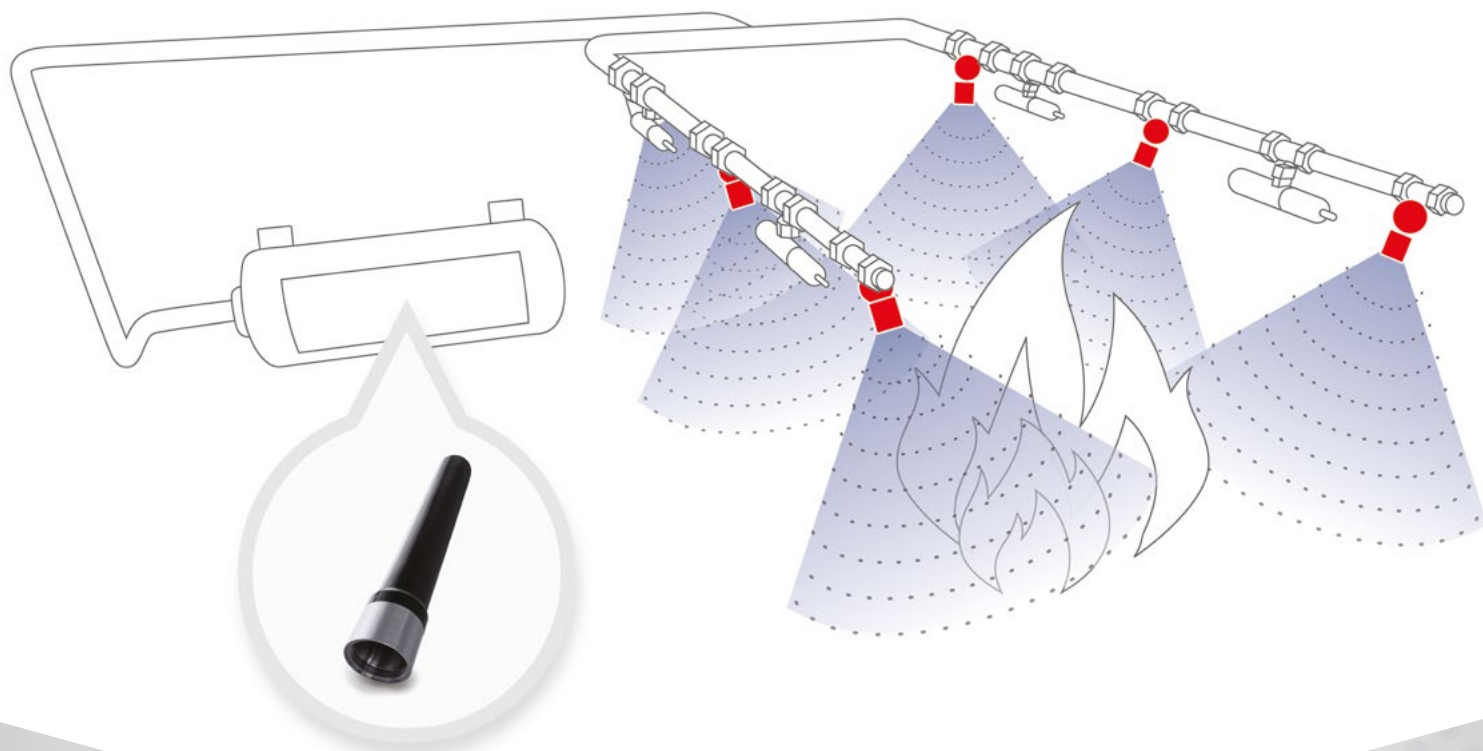


SAFE ON THE ROAD

Taking the bus to work, kindergarten or sports? For many people, this is everyday life. None of the passengers think about a fire in the bus. Nevertheless, manufacturers of buses and trucks must also take this eventuality into account in their design and take appropriate preventive measures. According to analyses by the expert organization DEKRA, 75 percent of all bus fires occur in the engine compartment. For this reason, the specialist

for fire protection and early fire detection, the company Protecfire from Lübeck, has developed a new, space-saving extinguishing system with only one line especially for the protection of these vehicles. The company turned to Jäger Gummi und Kunststoff GmbH with the challenge of being able to pump the extinguishing agent precisely into the line, regardless of its position.

CHALLENGE



HELPS IN SECONDS

Since the patented "detexline" extinguishing system, unlike conventional systems, works with only one line, both for fire detection and extinguishing at the same time. In normal operation, the system is depressurized and only becomes active in the event of an emergency. In the event of a fire, however, the extinguishing agent must be precisely delivered from the opening of the stainless steel extinguisher into the line within seconds. For a position-independent and fast extinguishing process, Jäger Gummi und Kunststoff together with Protecfire developed the so-called rubber bladder.

In case of fire, the following happens: The control head in the extinguishing system receives a command and triggers the gas pressure cartridge in the bladder. Starting from the bottom the bladder inflates in the extinguishing agent container. Thus, the available extinguishing agent is successfully pushed in one direction to the extinguishing pipe, which distributes the extinguishing agent through several nozzles. Therefore, it does not matter how the extinguisher is positioned.



SOLUTION

HIGHEST REQUIREMENTS FOR THE EXTINGUISHING SYSTEM

The specifications are extensive: The material must meet the requirements for extinguishing agents and be resistant to the application - at ambient temperatures from -30 °C to +80 °C. The wall thicknesses must be thin so that enough space remains in the extinguisher for the propellant gas cartridge (containing nitrogen) and the extinguishing

agent. Furthermore the bladder needs space to be inflated evenly from the base of the extinguisher. Consequently, the rubber bladder must be reliably manufactured with a consistent wall thickness in order to be able to press the extinguishing agent evenly from all sides towards the outlet opening to the extinguishing pipe.

SOLUTION



FROM THE RIGHT COMPOUND TO THE RIGHT TOOL

Together with its sister company Artemis, Jäger develops a tool concept and a suitable mixture. The requirements are high and must be met over a long period of time. The Protecfire system is designed to be maintenance-free for ten years and must be ready for use at all times. Due to the required material resistance at sub-zero temperatures, the compound experts from Jäger Gummi und Kunststoff and Artemis develop a mixture of extremely elastic natural rubber (NR) and styrene-butadiene rubber (SBR). In addition, a metal threaded ring is vulcanized on for connection to the extinguishing line.

The rubber bladder is manufactured using the injection molding (IM) process due to the tight tolerances. Initially, deviations in wall thickness still occur because the core centering cannot be held permanently. Therefore, the Jäger experts take a closer look at the injection molding tool used and realize a reliable core centering through a specific reworking. The product can then be delivered to Protecfire. But before it can be used, extensive tests have to be carried out.



RESULT

PUT THROUGH ITS PACES

In order to withstand the high demands of a fire, Protecfire carries out extensive tests on the finished product. Jäger's rubber bladder proves itself successfully in tests with extinguishing agents, under fire-like conditions, in a climatic chamber - for approval in cold areas - and in the state-approved SP4912 and UN-ECE-R107 test procedure for engine protection.

The test also checks how much extinguishing agent is pressed out of the extinguishing container and over what period of time. The results show: The rubber bladder forces more extinguishing agent out of the container than was initially assumed - there is hardly any need to allow for reserve in the extinguishing agent. Even a small container with only 7 liters of extinguishing agent can comprehensively extinguish a fire uniformly within 25 seconds - this applies to an engine compartment volume of up to 8 cubic meters.



RESULT

TRAVEL SAFELY INTO THE FUTURE

Since January 1, 2019, all new tourist buses and double-deckers in the European Union (Regulation UNECE R-107) must have a permanently mounted extinguishing system in the engine compartment. From 2021, this will also apply to regional and city buses. In this context, Protecfire's extinguishing system and the Jäger rubber bladder guarantee safe travel and reliable fire-fighting in all these vehicles.



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