SIMONA.report

Technical Newsletter of SIMONA AG 1/2013

A Sustainable Solution for Environmental Protection

SIMONA Biofilter for Landfill Degassing

Insight into a landfill gas filter containing biologically active filling material

The landfill gas filter made of electrically conductive polyethylene (PE-EL) is an eco-friendly product developed by SIMONA AG. It provides the means of systematically equipping post-closure landfill sites with antipollution components.

The construction of the landfill gas filter is the result of our long-term experience in landfill engineering. This innovative and ecologically valuable product extends the portfolio of SIMONA PE components for waste management.

Due to changes to legal regulations in 2005 and 2009, many landfill sites had to be either completely or partially closed and transferred to the post-closure phase. This closure ahead of schedule meant that the amount of gas emitted by landfill sites was reduced and that these landfill sites moved into the so-called lean gas stage. It was not possible to use the subsequently produced amount of gas in terms of energy generation or from a commercial perspective. This was the reason for taking measures to enable the gas to be discharged into the atmosphere without posing any danger to the enviroment. Since then it is recommended to equip landfill sites with passive biofilter systems in order to limit emissions.

Application of biofilters

In contrast to adsorption filters in which harmful substances are deposited on the large surface of the filter material, the SIMONA biofilter is filled with bark mulch containing biologically active substances. These organisms convert the lean gas components basically consisting of methane (CH_4) that are harmful to humans, animals and the environment into carbon dioxide (CO_2) and water (H_2O). Due to the activity of the microorganisms contained in the filter material the actual conversion process takes place without the need for any additional kinetic energy.

Your contact

Jochen Stender
Technical Sales Support,
Business Unit
Piping Systems

Jochen Stender completed his studies in Supply Engineering as a graduate engineer (Dipl.-Ing. (FH)) at the University of Applied Sciences in Gelsenkirchen in 1989. Following his degree, he first worked in waste incinerator construction, hot-gas filtration and wastewater treatment technology. His main focus was on standard and stainless steel for piping systems. In 1999 he started to work for SIMONA AG in Technical Sales Support and has been in charge of the dimensioning and calculation of underground pipeline systems and ducts in landfill and channel construction as well as relevant rehabilitation measures. He also supports the development of new products and applications in piping systems. Jochen Stender is also your competent contact for any projects involving industrial plastic piping systems.

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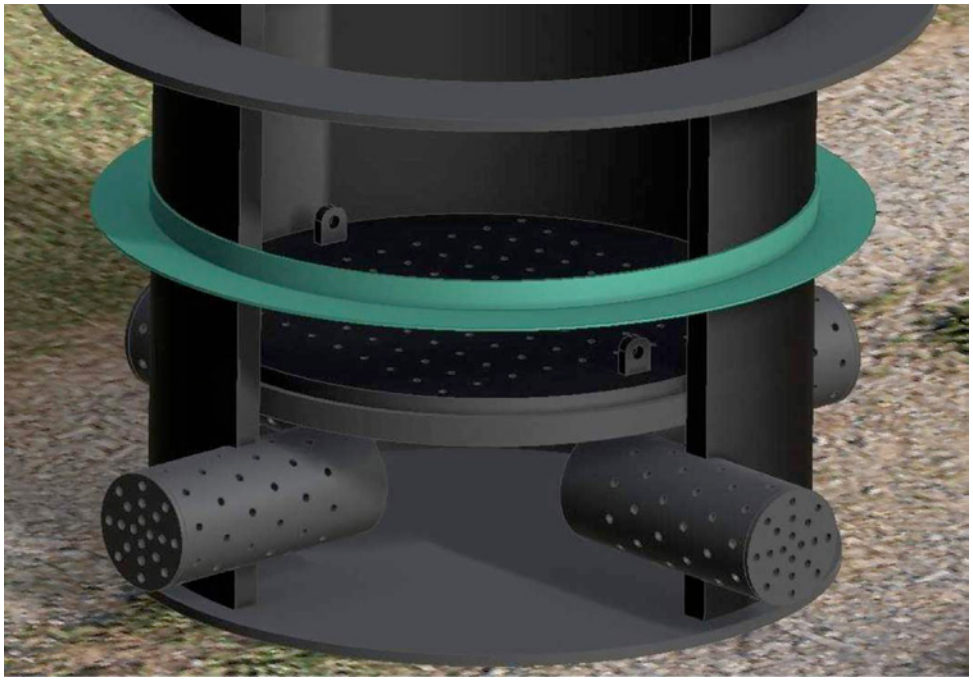


Bottom part of the filter with gas collection pipe for intake of landfill gas

Therefore, the SIMONA biofilter processes landfill gases in a strong environmentally friendly manner.

Differences in pressure inside and outside the filter produce gas movement. On the inside of the filter, changes in pressure arise due to biological decomposition processes during which microorganisms result in the filter material decomposing over time. On the outside of the filter, the air pressure changes with the prevailing weather conditions. This “breathing process” means that oxygen absorption is interrupted repeatedly – as a result, only those microorganisms that can tolerate a short-term lack of oxygen will survive in the filter.

Passive biofilter systems thus represent an eco-friendly solution for operators of landfill sites to discharge the occurring lean gases into the environment after treatment. In addition they also offer economical benefits since application and maintenance require very little effort.

Countless studies show that biofilters can reduce the post-closure costs for landfill sites thanks to low costs for investment, operation and maintenance.

Jochen Stender

Technical Sales Support
of Business Unit Piping Systems

SIMONA landfill gas filter during installation

Functional construction of the landfill gas filter

The SIMONA biofilter consists of two main components manufactured from electrically conductive polyethylene (PE-EL): A filter housing made of PE-EL with a gas collection pipe and a filling of bark mulch, as well as a PE-EL conical dome with a vent and an inlet unit. PE-EL is particularly suitable for applications with gases due to its excellent dissipation properties.

A welded PE collar is fitted to the filter enclosure for connection to the mineral barrier layer of the landfill site. Above and below this, clamping rings are used to establish non-positive connections to geo-textiles. Venting openings ensure the functioning of the biogas filter. An inlet unit is used for controlled addition of moisture and filter performance can be monitored by means of a measuring device in the conical dome. The dome can be removed from the filter housing for the purpose of inspection and servicing.

Preferably, fresh bark mulch with a granulation of 0 to 40 mm supplied by the forestry sector is the ideal filling for biogas filters.

Thermoplastic Sheets for Orthopaedics Technology

SIMONA® SIMOLIFE

With the new SIMONA® SIMOLIFE product group, SIMONA offers a comprehensive product portfolio especially for orthopaedic applications. The range of semi-finished parts made of PE, PP and PETG materials has been extended to include sheets engineered from ethylene vinyl acetate (EVA).

Thermoplastics have played a significant role in the development of modern orthopaedics technology and have become indispensable in this field of application. Today, they almost completely replace classical materials such as wood and leather.

In orthopaedics technology, the choice of possible plastics is very wide. Among others, polyolefins, ethylene vinyl acetate and polyester are used as compact sheet material (Fig. 1).

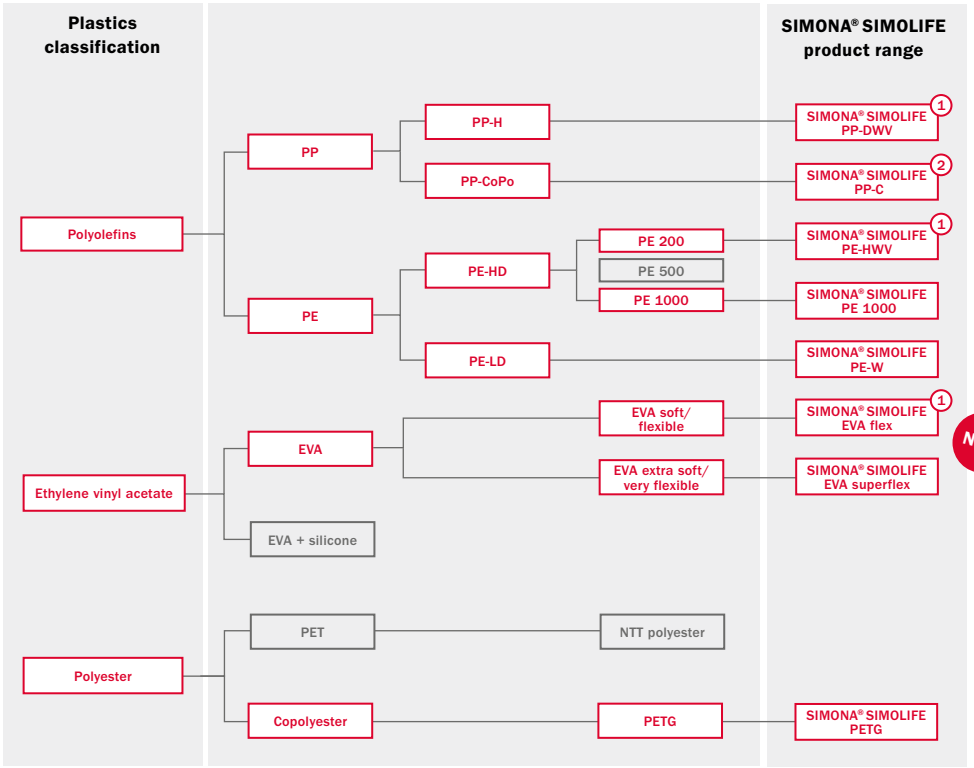
In order to satisfy individual patient needs and the requirements of processing possibilities for orthopaedic specialists, property profiles of different plastic types are used. Plastics are generally very light, physiologically safe, well tolerated by the skin and ensure a long-term, functional use. Simple processing of sheet materials means that orthopaedic specialists can adapt parts of orthoses and prostheses individually to individual patient anatomy. Each of these materials offers special benefits in one or more areas of application. Polyolefins (PE and PP) are used most frequently since they are excellently suited for the construction of orthoses and prostheses.

Recent years have seen a rapid advance in the technical development of prostheses construction. For example, carbon-fibre blades, shock arresters and computer-controlled knee joints have contributed to significantly improving the rehabilitation of persons with leg amputations. To ensure these high-tech prostheses work perfectly they have to fit perfectly to the patient's stump. A plastic shaft is used as the connector.

Product range

		SIMONA® SIMOLIFE EVA flex		SIMONA® SIMOLIFE EVA superflex
Sheets extruded (formats/thicknesses in mm)				
	400 x 400	3, 4, 6, 8, **9, 10, 12, 15**	6, 8, 10, 12	6, 9, **10, 12, 15**
	2,000 x 1,000	3, 4, 6, 8, 9, 10, 12, 15	–	–
	Colour	natural (translucent)	skin-coloured	natural (translucent)

Bold type = available immediately; Light-faced type = available on request
Special sizes and sheets with antibacterial properties available on request.



① Product also available with antibacterial properties
② Product will be available shortly

Fig. 1: Thermoplastics for Orthopaedics Technology

Plastics for Use in Health Care

Plastics can fulfil their full potential in individual stump bedding. Following amputation and successful compression treatment, interim restoration can start after just a few weeks. Using transparent prosthesis shafts has become established as it best enables the prosthesis shaft fit to be checked and optimised. For this, a shaft is produced from a SIMONA® SIMOLIFE PETG sheet, which is adapted continuously to the volume of the changing stump during the wearing period of approx. 6 months. Adaptation is performed using a hot air blower which returns the PETG shaft to a malleable state. Thanks to the excellent transparency of the material, parts to be reworked on the interim shaft can be recognised based on skin discolouration. A definitive prosthesis can be produced once the stump has stabilised sufficiently.

Generally the shaft of the prosthesis consists of two parts: an outer shaft made of carbon fibre-reinforced thermoset and a flexible inner shaft with high adhesion (Fig. 2). This property is especially important in order

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Link to SIMONA® SIMOLIFE EVA flyer

Fig. 2: Prosthesis shaft with flexible inner shaft

to ensure the highest possible adhesion between stump and shaft for the prosthesis wearer.

Ethylene vinyl acetate (EVA) has proven itself as the most suitable material for use as the inner shaft. EVA flex and EVA superflex from SIMONA are two product types which optimally meet the different requirements for material flexibility.

SIMONA® SIMOLIFE EVA Sheets have excellent hot-forming properties. The material displays minimal shrinkage during cool-down, thus ensuring a high level of dimensional stability with uniform wall thickness distribution as well as best possible fit. With properties including biocompatibility in accordance with DIN EN ISO 10993-5/-10 and resistance to sweat, cosmetics, skin creams and disinfectants, they offer excellent safety and extreme durability.

Acknowledged for its consistently high quality, SIMONA has been a trusted partner to the orthopaedic technology sector for many years. Regular audits and endurance tests are a valuable source of information for ongoing product development and refinement by our R&D engineers. This provides the basis for an innovative, premium-quality product range.

Dr. Jochen Coutandin

Head of Business Unit Mobility,
Life Sciences & Environmental Engineering

Material specifications

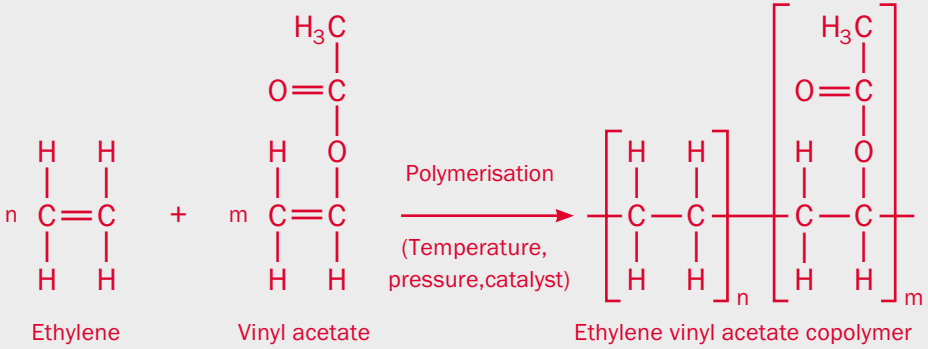
	Test method	Unit	SIMONA® SIMOLIFE EVA flex	SIMONA® SIMOLIFE EVA superflex
Density	DIN EN ISO 1183	g/cm³	0.934	0.955
Tensile modulus of elasticity	DIN EN ISO 527	MPa	75	19
Shore hardness D	DIN EN ISO 868	–	39	29
Crystalline melting range	DSC (10 °C/min)	°C	> 60	> 60

Plastics Expertise

Ethylene Vinyl Acetate (EVA) – The Flexible Copolymer

EVA is the abbreviation for **e**thylene **v**inyl **a**cetate, a statistical copolymer, which is produced from the monomeric basic components ethylene and vinyl acetate. In the DIN EN ISO 1043-1 moulding compound standard the material is called E/VAC.

The process for producing EVA is basically the same as the production process of LDPE (= Low Density Polyethylene), whereby the content of the co-monomer vinyl acetate varies:



EVA is a semi-crystalline material whose properties are mainly determined by the co-monomer vinyl acetate. This co-monomer interrupts the crystallisation of the polymer chain and therefore reduces the crystallinity of the material, i. e. compared to LDPE, EVA becomes more flexible and transparent as the vinyl acetate content increases. A reduced material strength reduces the melting range of the material as well. As a result, the melting range of EVA is lower than LDPE. The continuous service temperature is generally 40 °C maximum.

The characteristic, slightly vinegary odour of EVA is also the result of the co-monomer vinyl acetate.

Thanks to its specific material properties, EVA is perfectly suited as a material for applications in orthopaedics technology.

Dr. Steffen Kozempel

Technical Service Center (TSC)

Extended Training Programme for Customers, Partners and Employees

Launch of SIMONA Sales Academy

SIMONA AG has spearheaded its new training campaign with a seminar for twenty Czech customers. Located in Kirn, the SIMONA Sales Academy brings together the company's global training activities for customers and business partners. Additionally, the concept introduced by SIMONA includes advanced training and education programmes for company employees working in the areas of marketing and sales.

"SIMONA has always had an extensive training programme. More than 1,000 customers and business partners have already taken advantage of our professional education courses. We are committed to further extending this service and making it even more attractive," said Stefan Marx, Head of the SIMONA Sales Academy. "Our presenters and lecturers can draw on many years of hands-on experience. Thanks to their direct involvement in day-to-day business, they are always abreast of the latest information," he added.

Covering both theory and practice, the seminars are held in modern lecture rooms and workshops. Attendees can choose between a general seminar programme and individual training courses. This offering is complemented by "SIMONA Kunststofftage", an event dedicated to various topics centred around innovation and trends of the future.

The overview of training courses to be held in 2013 has now been published. The programme includes training relating to the fundamentals of semi-finished plastics as well as intensive seminars for piping systems and tank construction. For additional information as well as details of the presenters/lecturers and registration, please visit the following website www.simona-salesacademy.com.

Stefan Marx
Head of Sales Academy

Practical examples in our in-house workshops facilitate better understanding

Link to SIMONA Sales Academy flyer

Seminars take place in the lecture rooms of SIMONA

Upcoming training courses in 2013

Training courses	Date	Location	Language
Fundamentals of Semi-Finished Plastic Products	18 – 19 June 2013	Kirn	English
	24 – 25 September 2013	Kirn	German
Intensive Course in Piping Systems for Civil Engineering	14 – 15 November 2013	Ringsheim	German
Intensive Course in Piping Systems for Industrial Applications	28 – 29 November 2013	Ringsheim	German
Intensive Course for Tank Builders	20 – 21 November 2013	Kirn	German

▸ Book your place now!

Pressure Pipes for Natural Gas Pipelines in HDD Method

SIMONA® SPC RC- and RC-Line Pressure Pipes

Delivery of the SIMONA® SPC RC-Line Pressure Pipes, section length 20 m

As part of a construction project for a new natural gas pipeline in the Swiss cantons of Solothurn and Bern, utility company SWG Grenchen required robust, pressure-resistant plastic pipes. They had to be suitable both for trenchless and for sandbedless pipelaying. The choices made were SIMONA® SPC RC-Line Protective-Jacket Pipes and SIMONA® RC-Line Pressure Pipes.

Initial situation

The high-pressure gas pipeline that had been in place between the municipalities of Grenchen and Arch in the Swiss cantons of Solothurn and Bern since 1967 had to be renewed on account of safety aspects. Owing to the demanding installation conditions, the only pipe material deemed suitable by SWG Grenchen was plastic.

Task

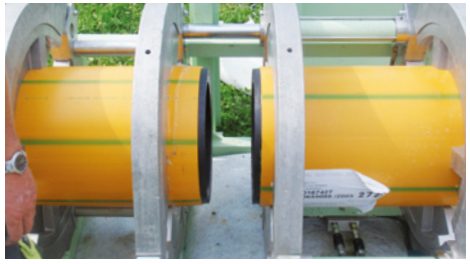
Since the route of the pipeline would go under public roads, SBB railway tracks, private properties and the River Aare, the new gas pipeline had to be laid by means of the so-called HDD method (horizontal directional drilling) as well as the trench cutting method. With this in mind, the plastic pipes had to meet the following requirements:

- Excellent bond strength and shear strength between inner pipe and protective jacket for trenchless pipe insertion
- No crack propagation from the protective jacket into the inner pipe
- Extremely effective protection against major physical damage such as notches, abrasion and wear
- High stress crack resistance
- SVGW approval

Solution

In the area of the HDD crossings, SIMONA® SPC RC-Line Protective-Jacket Pipes, d 400 mm, SDR 11, were jetted in place. Since SIMONA® SPC RC-Line Protective-Jacket Pipes offer extremely high resistance to physical damage on account of the pipe jacket being made of modified polypropylene, they are ideal for trenchless methods of pipe insertion.

By contrast, the trench cutting method was applied in the sandbedless pipe sections. Here SIMONA® RC-Line Pressure Pipes, d 400 mm, SDR 11, were laid. RC-Line pressure pipes are particularly suitable for this method because of their higher level of protection conforming to PAS 1075 Type 1.



Butt welding of protective-jacket pipes

Pre-welded train of pipes ready for pipe insertion

The project at a glance

Project

Construction of a new natural gas pipeline between Grenchen and Arch in the cantons of Solothurn and Bern, Switzerland

Requirements for the pipes

- SVGW approval
- High pressure-specific load-bearing capacity
- High abrasion resistance
- Suitability for alternative methods of laying such as horizontal directional drilling (HDD)

Products used

- SIMONA® PE 100 SPC RC-Line Protective-Jacket Pressure Pipes, d 400 mm, SDR 11, yellow with green stripes, PAS 1075 Type 3
- SIMONA® PE 100 RC-Line Pressure Pipes, d 400 mm, SDR 11, black with yellow stripes, PAS 1075 Type 1

SIMONA® PE 100 SPC RC-Line Pressure Pipes

Properties

- Excellent bond and shear strength between inner pipe and protective jacket
- No crack propagation from the protective jacket into the inner pipe
- Extremely effective protection against major physical damage such as notches, abrasion and wear (PP Protect)

SIMONA® PE 100 RC-Line Pressure Pipes

Properties

- High stress crack resistance
- High resistance to point loads (e. g. stones, fragments)
- In open laying the prepared excavated soil is used as backfill material

Thank you for your Valuable Support

Results of the Reader Survey

In the last SIMONA.report we asked you to take part in our reader survey. Thanks to the high return rate the results were conclusive. The following gives you an overview of our evaluation.

⅔ of those surveyed read every issue of the SIMONA.report, i.e. not just occasionally or when they are interested in a certain topic (Fig. 1).

88 % of all participants consider the scope of the report to be appropriate, only 9 % think that it is too short and 2 % too long. We were able to win most subscribers thanks to our website and our sales representatives (Fig. 2).

Our readers are most interested in the topics tank and apparatus construction, industrial piping systems and chemical process industry. Based on your written answers we were able to identify the content that you would be further interested in. Examples include food technology, deep drawing and thermoforming applications as well as semiconductor and electronics industry. Medical and orthopaedics technology were mentioned several times – we were able to meet this request with our article about SIMONA® SIMOLIFE in the current issue.

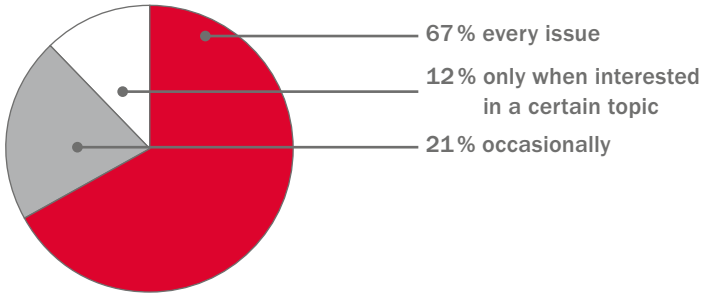


Fig. 1: How regularly do you read the SIMONA.report?

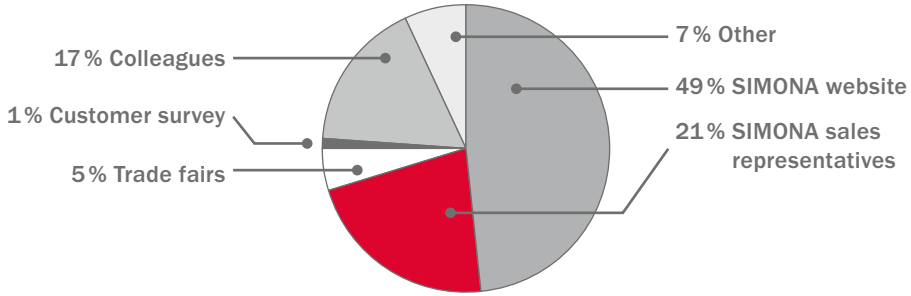


Fig. 2: How did you become aware of the SIMONA.report?

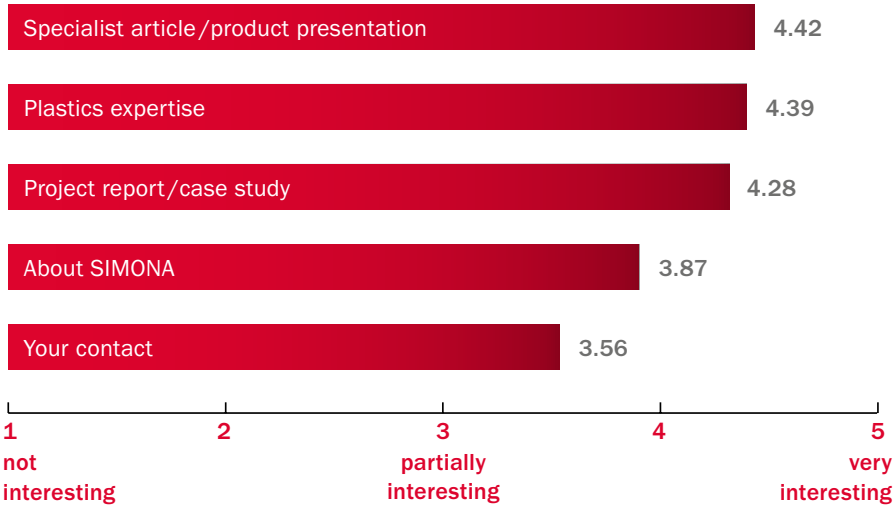


Fig. 3: Please specifiy your interest in the different SIMONA.report categories.

Our readers especially enjoy reading specialist articles or product presentations and plastics expertise as well as reports about actual projects (Fig. 3). The content and layout of the SIMONA.report was evaluated as good or very good by the majority of participants – we are especially pleased about this positive result.

We would like to take this opportunity to thank you for taking part in our survey. Your feedback will help us to improve our offer and to better accommodate your wishes in the future.

Imprint

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