

Alstom is counting on Angst+Pfister for its M7 rail engineering project in Belgium

A fast paced development timeline, solutions for complex technical requirements with combinations of strict fire protection regulations, needs for outstanding mechanical performances and suitability for complete systems integration – that was the key with which the engineers from Angst+Pfister won several contracts with the transport company Alstom. Alstom's customer, Belgian Railways, will be running with our anti-vibration and fluid technology as of 2018.



The M7 rail engineering project – a flagship for modern mobility solution for the people of Belgium: Nearly 1'400 new double-decker rail cars are due to be rolled out on the Belgian railway network beginning in 2018. Angst+Pfister's customer Alstom Transport is building a first batch of 90 motorized traction units for this major contract. Alstom requires anti-vibration and fluid technology components for the installed HVAC units as well as for the main traction transformer.

It began with a special ventilator and auxiliary transformer bearings

"In March 2016, our management was given the opportunity to present our technologies and our competences to Alstom Transport in Belgium," explains Emanuele Varini, Project Engineer at Angst+Pfister. Shortly after this, the Alstom engineers contacted Angst+Pfister. "Initially our task was to design a special vibration isolation support for an auxiliary transformer and for a ventilator necessary for the cooling system of the coaches. We provided Alstom with the preliminary sketches and information on the design, which convinced them," says Emanuele Varini. "But the real challenge was in harmonizing the mechanical qualities of the bearing ensuring long lifetime whilst meeting the requirements of the European railway fire protection regulation EN 45545-2. In addition, Alstom needed us to meet a fast paced development timeline".

Angst+Pfister invests in a new product

All this culminated in Alstom issuing a highly detailed catalog of requirements and specifications for this special HVAC bearing. This included vibration isolation properties, mechanical resistance to shock loads, temperature resistance, chemical compatibilities, corrosion protection and electrical resistance properties. On top of this, the fire resistance level of EN 45545-2 R22 HL2 was necessary. "Rubber burns and the chemicals added to enhance the fire resistance may influence its mechanical quality," says Emanuele Varini. "Finding the optimum mix requires intensive research and tests. For this level, the rubber must pass three tests: it has to be very flame-retardant (oxygen index acc. EN ISO 4589-2), it should produce as little smoke as possible (smoke density acc. EN ISO 5659-2) and the smoke should pass a toxicity analysis (smoke toxicity acc. NF X 70-100-1/-2)," explains Emanuele Varini. In order to properly tackle the problem, an intensive tests plan was organized. "Even before the contract was awarded, Angst+Pfister decided that we would invest our resources in this project," says Emanuele Varini. This gesture of anticipatory confidence in the customer eventually paid off. The Angst+Pfister engineers set out to explore the limits of the fire retardancy and mechanical performance of the product managing to meet the customer specifications and deadlines, eventually being awarded the contract.

Four projects at the same time

An open attitude is very much appreciated by the customer: As a result Alstom showed interest in a further fluid technology solution for the HVAC cooling unit – ASSIWELL® metal hoses – after the Angst+Pfister engineers demonstrated their core capabilities in the field during a proactive engagement. “This is a complex system with hoses, pipes, and covers welded together,” explained the lead engineer Steve Spirlet, and continues: “Our strength does not lie only in delivering isolated components, but rather in developing an entire system. In this way we can reduce interfaces, for instance, and simultaneously the cost.” Alstom appeared to be more than happy with Angst+Pfister’s recommendations: “When we delivered both the anti-vibration and fluid system prototypes, we received a further project for a special traction transformer bearing from an Alstom plant in France,” reports Emanuele Varini. This time the issue was vibration damping for the main transformer of the vehicle which converts the power from the transmission

lines to run the vehicle's motors. Again, speed was of essence. “The delivery deadline for the prototypes was very tight,” Emanuele Varini remembers. Having met this challenge, Alstom France was then also interested in Angst+Pfister’s fluid technology to cool hot oil with an air feed for this transformer. Here, too, ASSIWELL® hoses have been designed to good use.

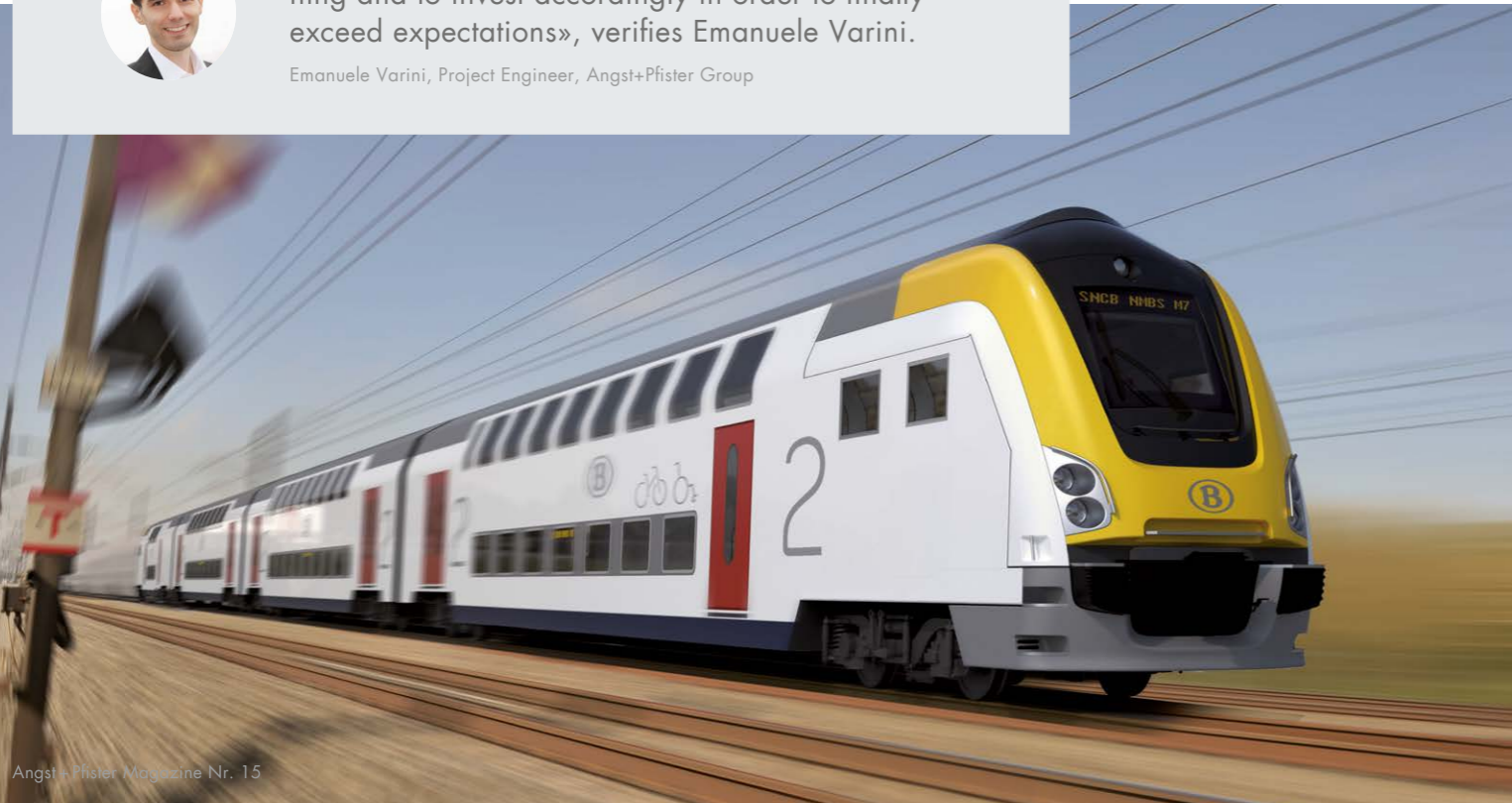
Good customer relationships motivate

All the projects finally went into serial production but the Alstom story and the M7 rail engineering project have not finished yet. Angst+Pfister is currently engaged in designing and producing a further special anti-vibration tube clamp for the hoses of the cooling unit. “It paid off to make that extra effort from the beginning and to invest accordingly in order to finally exceed expectations” verifies Emanuele Varini. In addition, he lays great value in a good and personal relationship with the engineers of the customer. “We speak the same language and we can understand each other very well. Joint projects are also a lot of fun.”



«It paid off to make that extra effort from the beginning and to invest accordingly in order to finally exceed expectations», verifies Emanuele Varini.

Emanuele Varini, Project Engineer, Angst+Pfister Group



EN 45 545 Fire Protection Certificates on Angst + Pfister products



APSOvib® Anti-vibration Technology

Part type	Material	Hardness ShA +/-5	DIN EN 45 545
Anti-vibration elements for bogies (layer springs, primary buffers, round and stop buffers)	NR	50 ShA	R24: HL2
	NR(BR)	70 ShA	R24: HL3
Floor supports	CR	45 ShA	R10: HL2
	CR	49 ShA	R9: HL3, R10: HL3
	CR	70 ShA	R9: HL3, R10: HL3
	EPDM	46 ShA	R10: HL3
Floor supports – Metal Cushion	Metal Cushion		> HL3
Floor supports – PUR – metal	APSOPUR® L55 (12.5 mm)		R10: HL3

APSOseal® Sealing Technology

Part type	Production technology	Material	Type	Hardness ShA +/-5 (Density g/cm³)	DIN EN 45 545
Molded parts, molded flat gaskets, O-rings	Compression	EPDM	Compact	60 ShA	R1: HL2
		EPDM	Compact	70 ShA	R22: HL3, R23: HL3
		VMQ	Compact	40 ShA	R22: HL3, R23: HL3
		VMQ	Compact	70 ShA	R22: HL2, R23: HL3
Flat gaskets	Punching	EPDM	Compact	70 ShA	R22: HL3, R23: HL3
		VMQ	Foam	(0.16 g/cm³)	R22: HL3, R23: HL3
		VMQ	Foam	(0.208 g/cm³)	R22: HL2, R23: HL2
		VMQ	Foam	(0.35 g/cm³)	R22: HL3, R23: HL3
		VMQ	Foam	(0.43 g/cm³)	R22: HL3, R23: HL3
		CR	Foam – closed cells	(0.195 g/cm³)	R24: HL3
Elastomeric profiles	Extrusion	EPDM	Compact	50 ShA	R22: HL2, R23: HL2, R24: HL2
		EPDM	Compact	60 ShA	R22: HL3, R23: HL3, R24: HL3
		EPDM	Compact	65 ShA	R22: HL3, R23: HL3
		EPDM	Compact	70 ShA	R22: HL3, R23: HL3
		EPDM	Compact	75 ShA	R22: HL3, R23: HL3
		EPDM	Compact	77 ShA	R22: HL3, R23: HL3
		EPDM	Foam	(0.8 g/cm³)	R22: HL2, R23: HL2
		EPDM	Foam – mixed closed and open cells	(0.8 g/cm³)	R22: HL2, R23: HL2
		VMQ	Compact	40 ShA	R22: HL3, R23: HL3
		VMQ	Compact	50 ShA	R22: HL3, R23: HL3
		VMQ	Compact	60 ShA	R22: HL3, R23: HL3
		VMQ	Compact	70 ShA	R22: HL3, R23: HL3
VMQ	Foam – closed cells	(0.35 g/cm³)	R22: HL3, R23: HL3		
VMQ	Foam – closed cells	(0.55 g/cm³)	R22: HL3, R23: HL3		

APSOfluid® Fluid Handling Technology

Part type	Product	Material	DIN EN 45 545
Industrial hoses	Conveyance hose for water	EPDM	R22: HL3 R23: HL3
	Cable protection hose	EPDM and NBR	R22: HL3 R23: HL3
	Cable protection hose	Silicon	R22: HL3 R23: HL3
	Air brake hose	CR	R22: HL3 R23: HL3
Hydraulic hoses	Hydraulic hose Type 2TE	NBR/EPDM	R22: HL3 R23: HL3
	Hydraulic hose Type 15C	NBR/EPDM	R22: HL3 R23: HL3
	Hydraulic hose Type 25C	NBR/EPDM	R22: HL3 R23: HL3
	Hydraulic hose Type 15N	NBR/EPDM	R22: HL3 R23: HL3
	Hydraulic hose Type 25N	NBR/EPDM	R22: HL3 R23: HL3
	Metal hoses	ASSIWELL® metal hoses	Stainless Steel

APSOplast® Engineering Plastics Technology

Material	Type	DIN EN 45 545
UP-HLM FR	Hand layup GRP Laminate	R1, R2, R3: HL2
UP-GRP	Pultrusion profile	R1, R2, R3: HL3 R22, R23, R24: HL3
UP-GM 203	Red/white	R1, R2, R3: HL2 R22, R23, R24: HL3
EP-GC 202	Natural, (Yellow/brown)	R7, R17: HL2 R1, R2, R3, R11, R12, R22, R23, R24: HL3
PE-UHMW FR	Black	R7: HL2 R10, R24, R26: HL3
PA 66 FR	Black	R17, R23: HL1 R24, R26: HL3
PA 6 FR	White	R22, R23, R24, R26: HL3
PA 6 FR	Extrusion profile, coloured	R22, R23, R24, R26: HL3
PC FR transp	Transparent, flame-retardant	R4: HL3

In addition to this range of products, we can supply you with special and/or customised products upon request at any time: consult us!



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