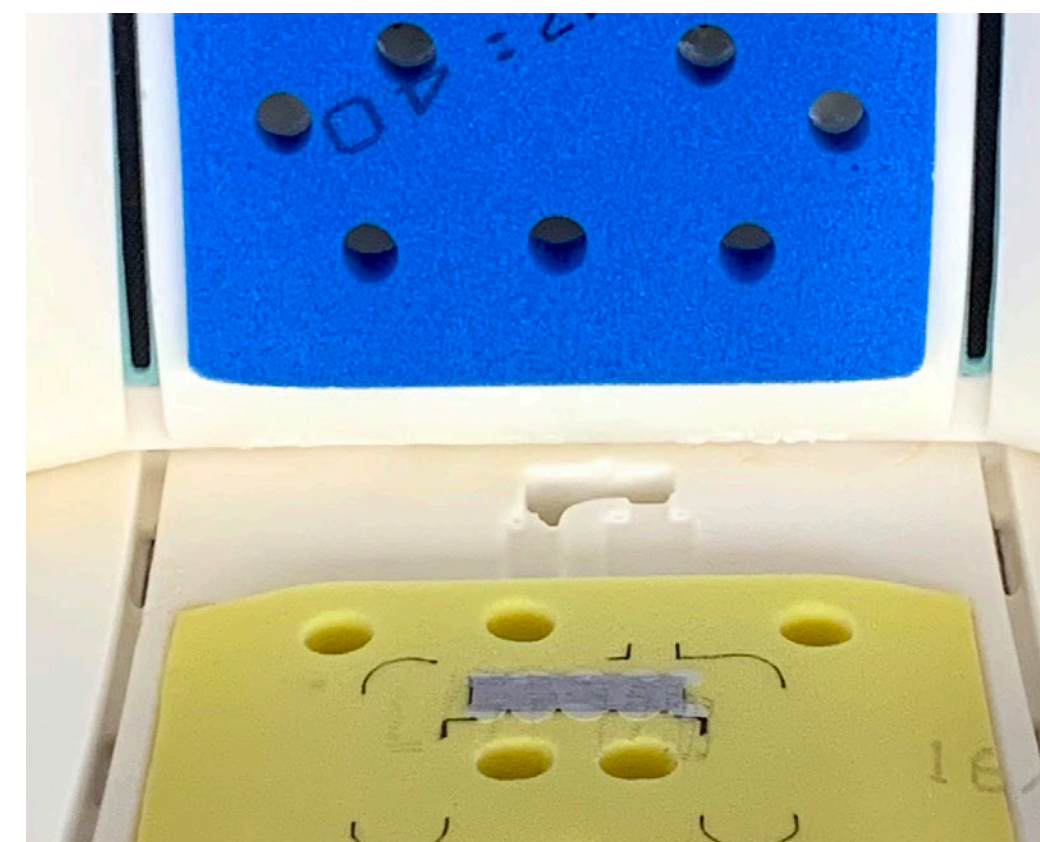


The New Horizon of Foam





COMPANIES

Toscana Gomma and Gestind

Toscana Gomma SpA and Gestind SpA are part of Olmo Group, European leader in the production of flexible polyurethane foams for the automotive, bedding and furniture markets. Toscana Gomma SpA develops, engineers and produces slab foams, ether and ester, moulded foams for seats and moulded foam for pillows. Gestind SpA develops, engineers and produces headrests, including bezels and armrests, with 3 different foaming technologies.

Together, they have developed a new product, known as Memory CSF.

Memory CSF is a Toscana Gomma SpA & Gestind SpA patented technology, which integrates their Performance Memory Foam in headrests, moulded foam for seats and armrests.

The technology is already running in serial production.



PERFORMANCE MEMORY FOAMS

Automotive Qualified, Stable to Temperature Changes

The table below lists a range of possible hardnesses for the Performance Memory Foam. Specific hardness, memory effect and cutting thickness can be achieved by project-specific requests. See the Appendix for thermal behavior analysis data.

Material	Damping [%]	Density [kg/m^3]	P4/40% [kPa]	Compression Set [%]	Burning test FMVSS 302 [mm/min]	Notes
PER401	80	38-40	1.2	7	<100	Available
PER402	70	38-40	2	4	<100	Available
PER404	60	38-40	4	1.51	<100	Serial production from Q4/2021

Memory CSF is the new horizon of **comfort** and **safety** in headrests and moulded foam seat pads for the automotive industry.

Headrests



MEMORYCSF
COMFORT SAFE FOAM



HEADRESTS

Geometry and Safety

A good geometry is essential for an effective head restraint. If a head restraint isn't behind and close to the back of an occupant's head, it can't prevent whiplash in a rear-end collision.

Cost-efficient Safety

Thanks to their comfortable material, users will no longer feel the need to adjust the headrest back and forth. Therefore, it is sufficient for our headrests to only move in two directions (upwards and downwards) to achieve high-level comfort and safety. They do not require a four-way system like other products.

Not only does this ensure that the vehicle's occupants will always maintain the headrest in the correct place, but it also makes our product less expensive to produce.

Whiplash Prevention

Memory CSF headrests guarantee a superior comfort for occupants, leading them to lean their head against the headrest. This results in an improvement in safety conditions, especially regarding whiplash injuries.



Comfort

Memory CSF headrests guarantee a superior comfort for occupants, thanks to an innovative memory-foam material which dynamically adapts itself to pressure.

Safety

Memory CSF headrests are designed to maximize safety: their comfortable material means occupants won't feel the need to adjust them, keeping the head in the correct position and minimizing whiplash effects.

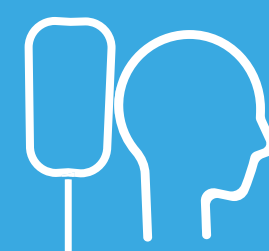
Advantages Compared to Standard Headrests



Improved safety



Good cost-efficiency compared to other four-way headrests



Better comfort compared to all traditional and four-way headrests, granting a better back-set



A better dissipation, compared to standard foam*



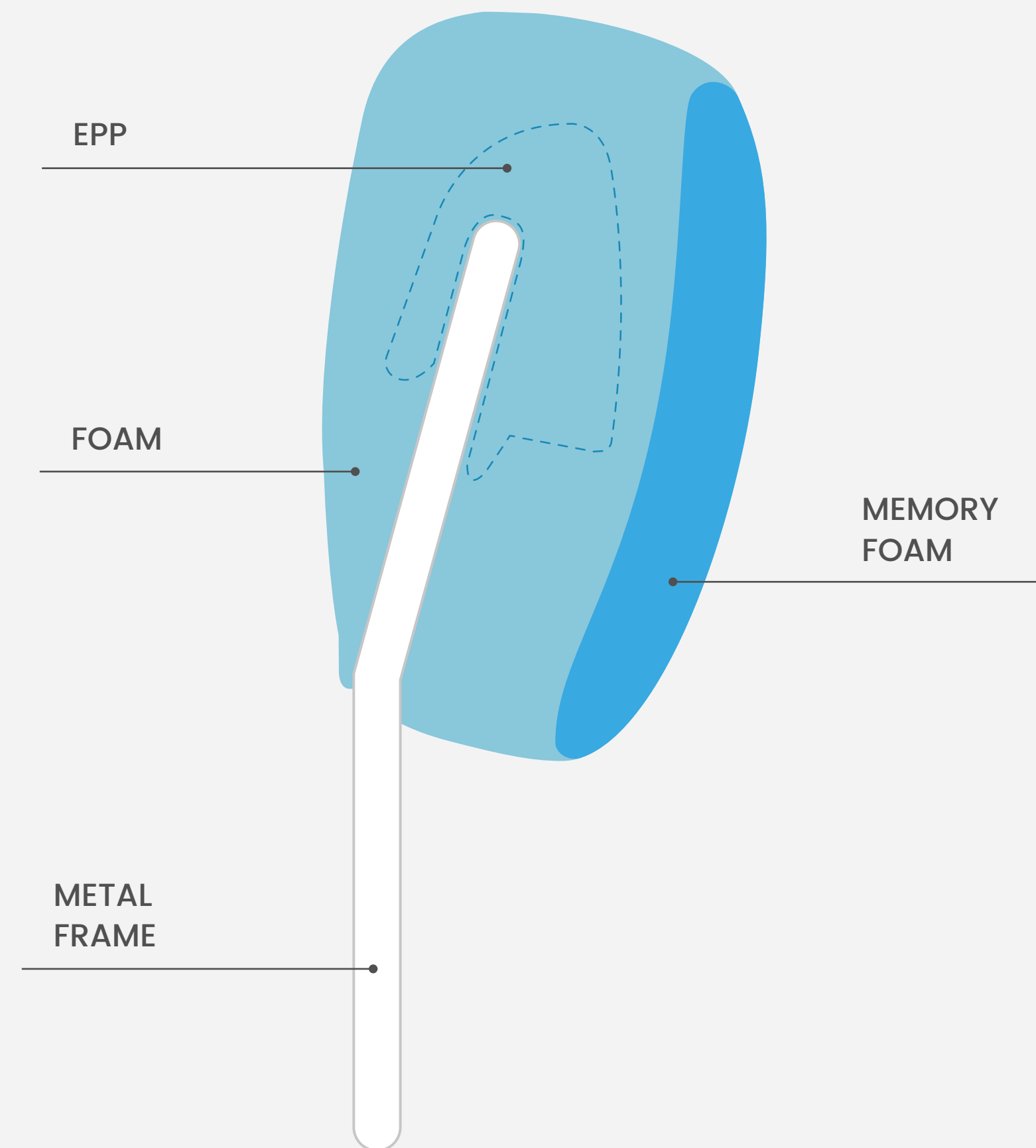
Vertical double hardness

* Tested according to Impact Test on serial front headrests, which resulted in the following deceleration:

- from 17,4G of the current standard foam;
- to 10,6G of 30 mm Performance Memory Foam type PER402

Conventional and Foamed in place

The memory foam integration can be managed using both technologies: conventional and foamed in place. Here is an example of a conventional headrest already set out for production.



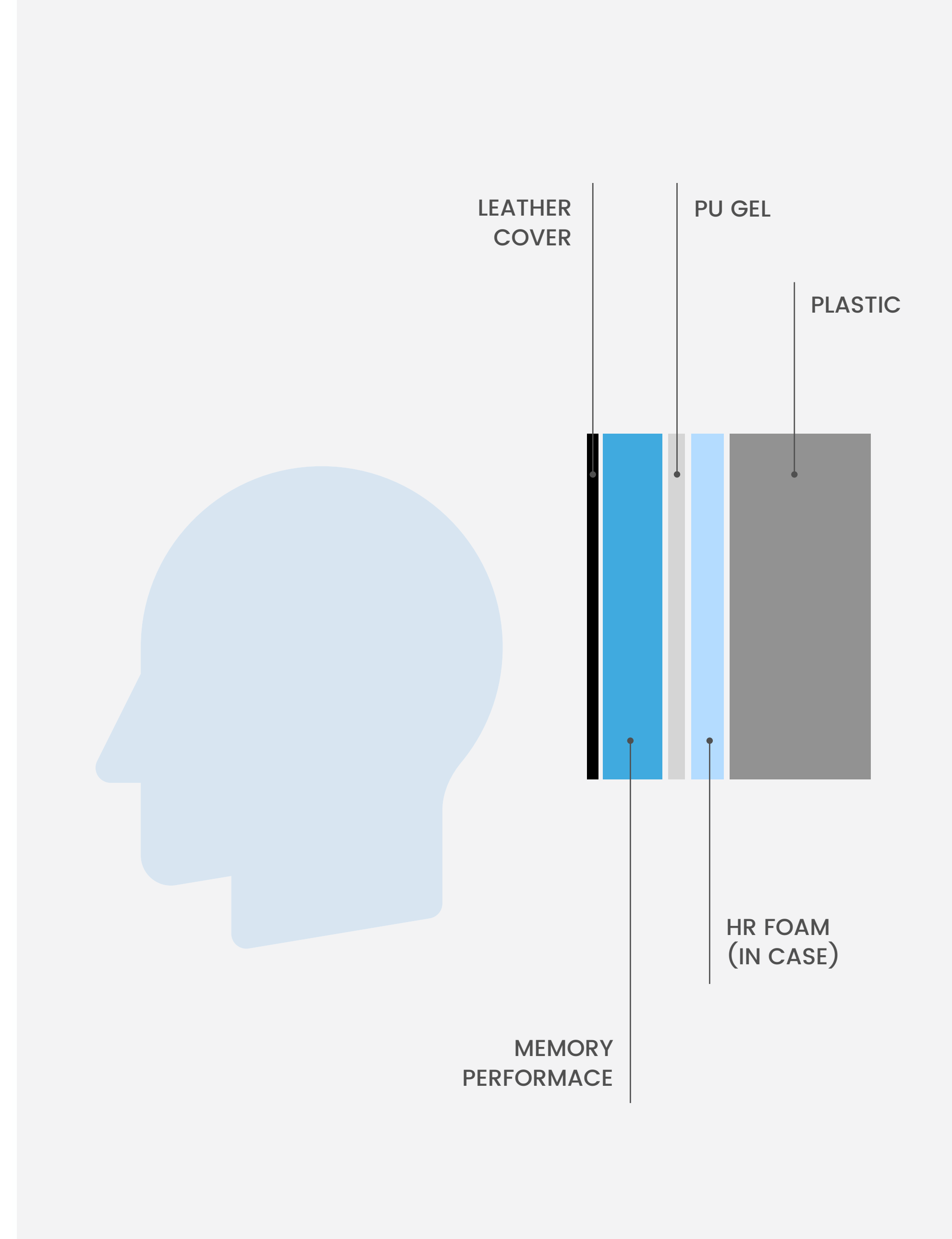


UPGRADE

Memory CSF Combined with Polyurethane Gel

For those headrests using a plastic insert and having low foam thickness, we developed and patented a technology combining Memory CSF and Polyurethane gel.

A thin layer of PU gel distributes the pressure peaks, helping to reduce “meet to plastic” feeling during driving and improving dissipation in a crash. According to the project and its target, the PU gel can be expanded or not expanded.



Moulded Foam Seats



MEMORYCSF
COMFORT SAFE FOAM



FOAM SEATS

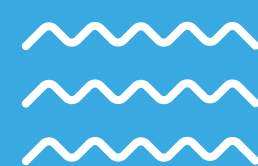
Comfort and Breathability

Moulded foam seats in Performance Memory Foam maximize comfort for occupants both for short and long-term use. The passing holes guarantee optimal thermal regulation and breathability of the seat, if it is assembled with the right cover.

Advantages Compared to Standard Moulded Foam Seats



Better pression distribution



Better vibrational comfort



Better feeling



Better seat aesthetics



Vertical double hardness

Moulded Foam for Seats

Here is an example of the co-moulding of Performance Memory Foam in foam pads for seats. The thickness of the material can vary from 15 to 30 mm, depending on the area taken into consideration.

Seat

MEMORY FOAM
TG AUTOMOTIVE



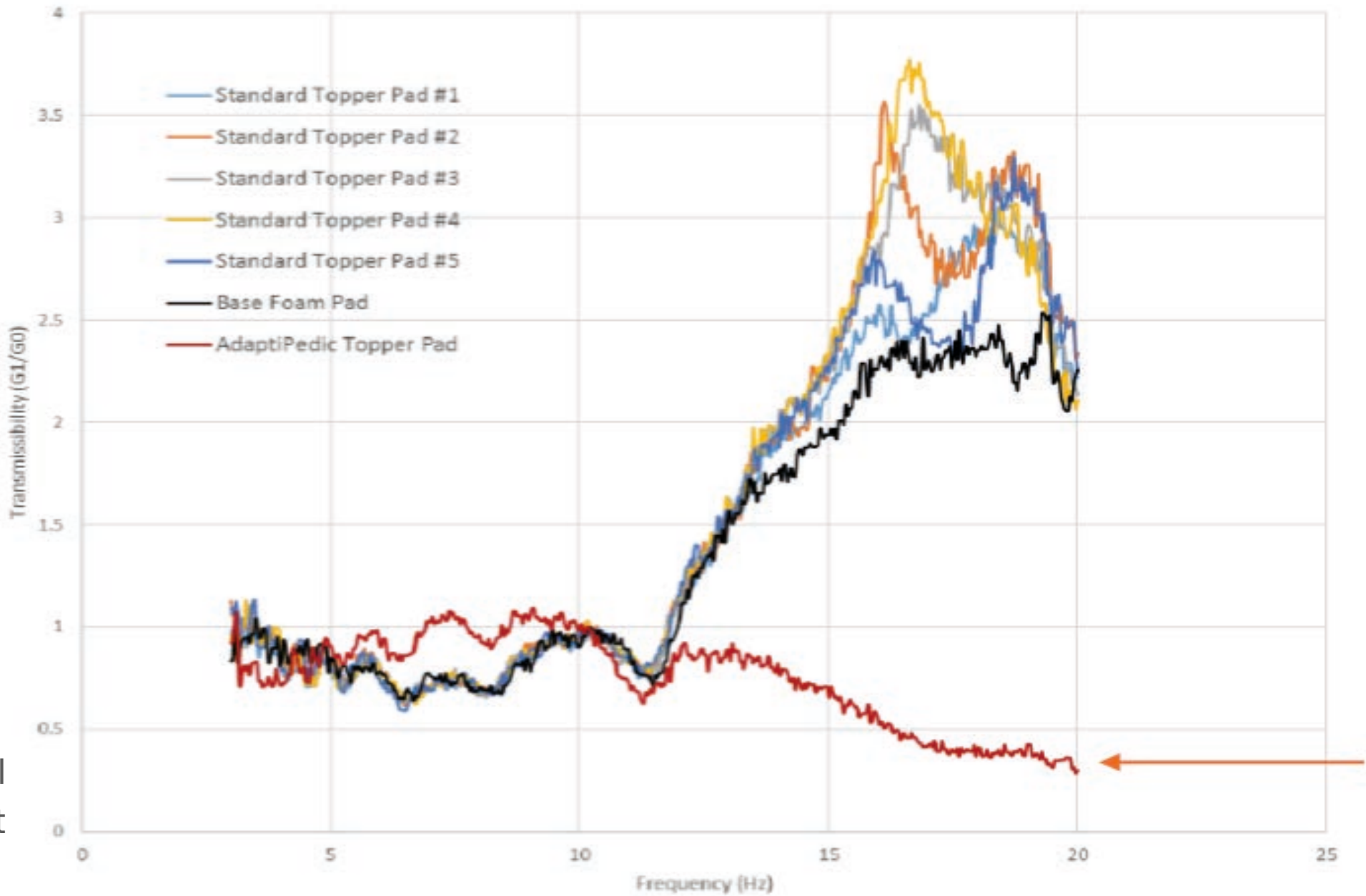
MEMORY FOAM
TG AUTOMOTIVE

Back



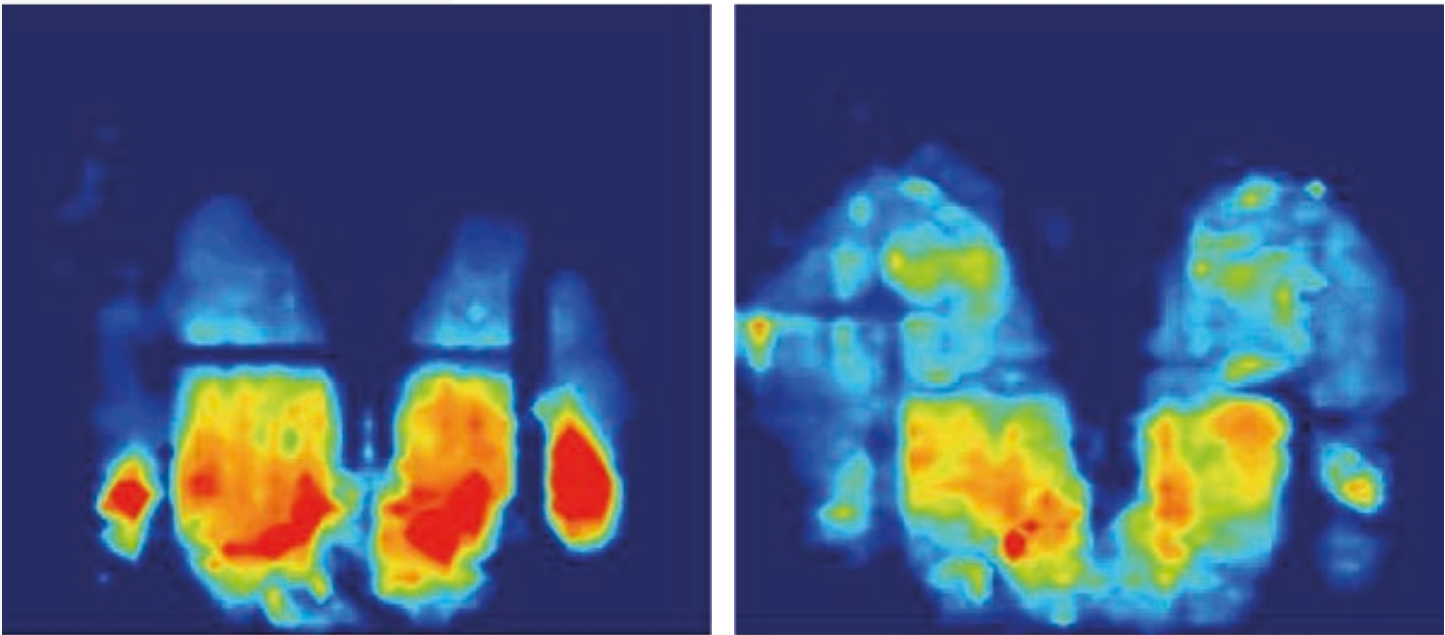
MEMORY FOAM
TG AUTOMOTIVE

Vibrational Comfort and Pressure Distribution



Better vibrational
comfort

Better pressure
distribution





The Passive Ventilated Seat

Our passive-ventilated seats combine covers laminated with our breathable lamination foam to moulded foam pads in Memory CSF with holes.

These seats offer a top seating comfort for a relaxing driving experience, a highly improved hydrothermal comfort at low cost and a high adaptability.

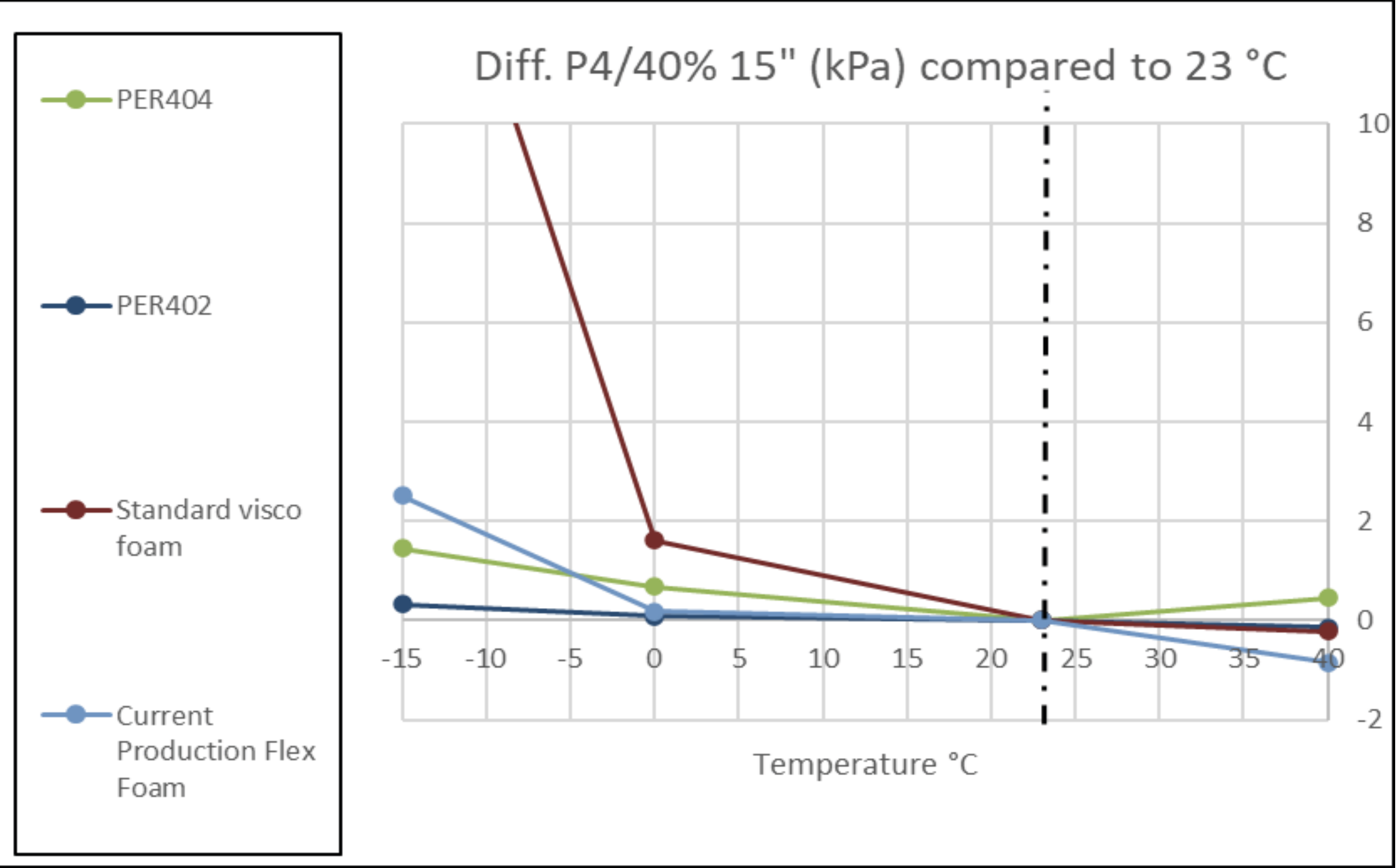
APPENDIX

**Thermal behavior analysis of
Performance Memory Foam
compared to Moulded HR
Foam for headrests and
conventional Memory Foam**

MEMORYCSF
COMFORT SAFE FOAM

Our Performance Memory Foam has been tested in comparison to the current Gestind moulded flex foam production for headrests and to standard Visco foam.

Foam type	P4/40% [kPa]			
Temperature °C	-15	0	23	40
PER402 (Performace Memory)	2.40	2.16	2.07	1.94
PER404 (Performace Memory)	5.41	4.65	3.96	4.41
Standard Visco foam	20.36	4.74	3.12	2.91
Current production moulded flex foam for headrests	10.98	8.64	8.46	7.61



As shown in the graph, Performance Memory Foam has the same behavior of moulded HR flex foam used in headrest application: the hardness-increase at lower temperatures is very limited.

The graph also shows the difference between the Performance Memory Foam and the standard Visco foam at lower temperatures.

Further and more detailed data is available upon request.

Test Method

The Performance Memory Foam has been tested in comparison to the current Gestind moulded flex foam production for headrests and to a standard Visco foam.

Method for measuring hardness and damping

- Sample size: 380x380x30 mm
- 1st cycle: preload at 0.1 kPa; compression at 65% of original height at 300 mm/min; record compression and release curve;
- 2nd cycle: compression at 65% of original height at 100 mm/min; record compression and release curve;
- 3rd cycle: compression at 65% of original height at 100 mm/min;
- 4th cycle: compression at 40% of original height at 100 mm/min, 15" stop, record hardness value; go to 65% compression, 15" stop, record hardness value.

Compression set (%)

- Sample size: 100x100x50 mm
- Measure the height of the sample
- Leave the sample compressed at 50% of original height at 70° C for 22 h
- Measure the height again
- Compression set is the difference in height compared to the original one



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