

Gallet F1 XF

Technical presentation file



A helmet patented and manufactured in France

Gallet F1 XF

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Developed with firefighters worldwide, the Gallet F1 XF helmet defines new standards for firefighters' helmets. It is part of a new level of protection, integration of functionalities, user comfort and versatility.

Thanks to its configurable design, the Gallet F1 XF helmet is ideal for a range of operations, such as building fires, outdoor fires, technical rescue operations and road accidents.

This document will outline how the Gallet F1 XF helmet differs from others on the market by analysing its main components in detail: helmet shell, impact liner, face shield, ocular visor and other accessories.

It also aims to draw attention to aspects linked to its use, such as adjustments, comfort or even its compatibility with other firefighting equipment by providing specific points for you to carry out your technical analysis.

1. Helmet components

Each component is evaluated and tested using a clear protocol. Because the material itself is not everything, MSA has also chosen not to restrict itself to what is described in the EN443 and EN14458 standards to ensure maximum security for wearers, especially with regard to the vital components of the helmet.

During the design of the Gallet F1 XF helmet, MSA engineers carried out research on new materials for the helmet shell and the shock absorption system. Indeed, different laboratory tests were carried out to check the performance of many materials, their conformity with the standard, but MSA also carried out various, more rigorous internal tests designed by the group.

These 'non-standard' tests, such as accelerated ageing, were designed to reproduce as effectively as possible the behaviour of the helmet in the field for its entire lifespan.

In addition to the mechanical and thermal performance tested for, the choice of materials was made according to the impact of the helmet's weight. This criterion guided our selection to a high-resistance thermoplastic material for the shell and a bi-density impact liner to **keep the helmet as light as possible, while maintaining optimal protection.**



The shell

MSA chose to use **thermoplastic materials** as opposed to composites with thermosetting resins to ensure good repeatability of the process and, therefore, of the product, to precisely obtain a good surface condition and complex shapes.

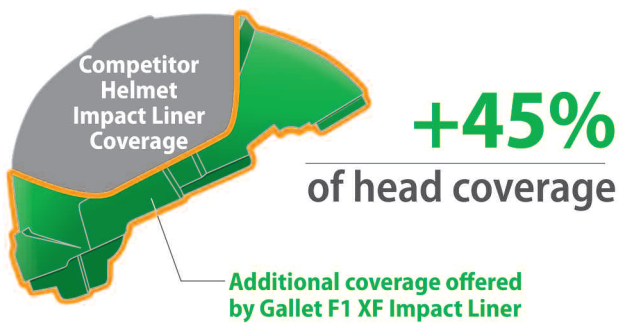
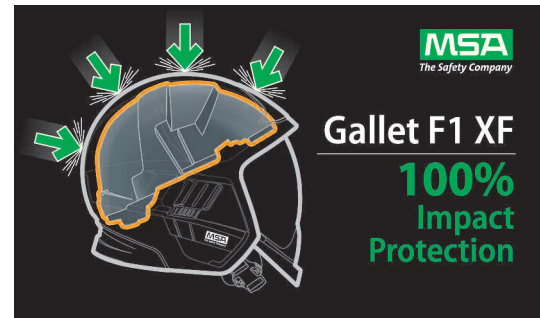
Furthermore, it should be noted that the use of a composite material with a higher glass fibre content tends to increase the thermal conductivity of the bonding agent, which reduces its thermal resistance with the same level of thickness (in comparison with thermoplastics), which would lead to earlier and more intense overheating of the impact liner.

Finally, thermoplastics offer the advantage that they can be **easily recycled** unlike composites, which are still difficult to recycle.

To respect the environment, MSA has invested in a new chain of paint so that our helmets are coated with **(solvent-free) hydro-type paints.**

The impact liner

Maximum mechanical protection
thanks to an XL visor cover

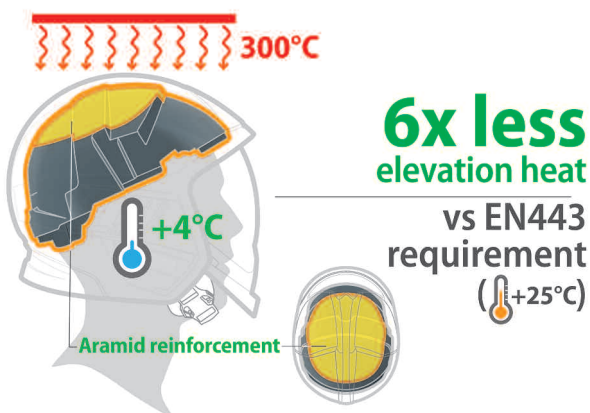
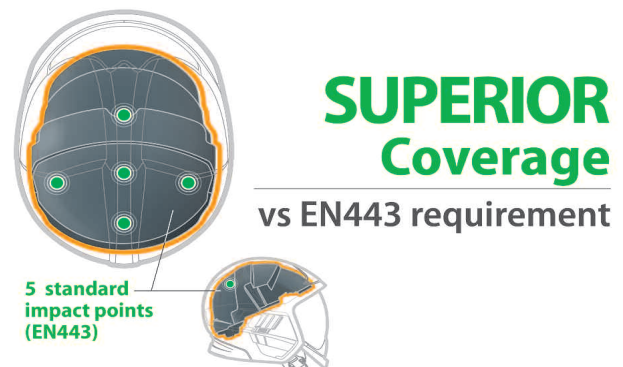


The impact liner in the Gallet F1 XF has been considerably extended in order to protect **the wearer's entire head** against shocks and heat. The impact liner does not just cover half of the skull, as is the case for the majority of helmets on the market. Because a shock to the forehead could be fatal.

Tests conducted internally in our laboratory on several models of EN443-certified helmet prove that impact to the shell alone, in an area not protected by the impact liner, can seriously injure the wearer. So, MSA has opted for maximum protection rather than limiting itself to the minimum size stipulated in the regulations.

The impact liner in the Gallet F1 XF comprises high-density, shock-absorbing polyurethane foam and aramide casing. This ensures **integral protection (from impact and penetration) for the top, front and sides of the helmet**, and not only for the impact points covered by the standards defined in EN443. As a result, the Gallet F1 XF impact liner covers almost all the shell.

MSA does not compromise on the safety of firefighters.



The aramide layer on top of the impact liner also ensures **more heat protection**. This heat protection is also a major advantage over competitors' helmets, as was mentioned by wearers at training sessions in a fire box or following feedback on use in real fires. The perception of heat inside the helmet was minimal compared to competitors' helmets.

The radiant heat exposure test (EN 443:2008 section 4.7) exposes one of the side impact points (left or right) to **14 kW/m² heat flux (approx. 300°C) for 8 minutes**. It is then checked to ensure that the temperature measured on the head form **does not increase by more than 25°C**. After exposure, and within 60 seconds, an impact test is performed to check

the helmet's mechanical performance when exposed to extreme heat stress.

The average temperature increase **under a Gallet F1 XF is only around +4°C** (average based on 205 lab tests recorded on the Gallet F1 XF), and the force transmitted to the head form is way below the limit of 15 kN, with full protection maintained against penetration.

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2. Helmet accessories

MSA has chosen to **certify all its accessories compatible with the Gallet F1 XF helmet in the same way as for the actual helmet**, guaranteeing maximum security for the wearers. For example, all lamps on MSA helmets, ear protection, communication equipment and their brackets are **guaranteed fire-proof**.

The materials are selected according to the requirements requested, such as flame-resistant characteristics for the external parts or those parts than can come in contact with the flames such as the accessories. For example, the neck curtains are designed with 2 or 3 layers so that any flames are extinguished in under 5 seconds.



All the metal components used in the helmet are designed to resist at least 400 hours of saline mist without the appearance of red rust.



The benefits our Gallet F1 XF helmet:

The materials of our communication system are selected to meet the requirements of the ATEX Directive, just like MSA lamps.

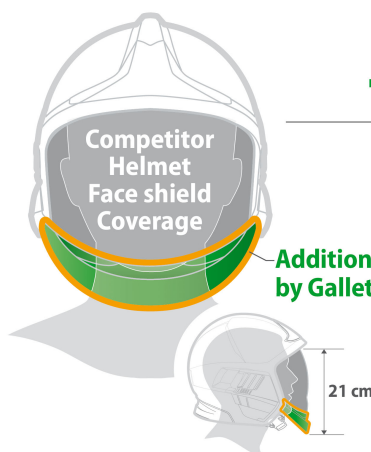


In addition, the antistatic properties of the Gallet F1 XF helmet and its accessories, in accordance with the standard IEC-60079-32-2:2015, have been checked by an outside laboratory to ensure that wearers can use them safely in ATEX explosion zones.

Face shield

Extended visor cover

In accordance with EN14458:2004, the visor cover must protect the face from all sides (left / right / front / rear) as cited in the reference standard (EN168 §10.2). Thanks to its **greater coverage above the minimum required by EN14458**, the Gallet F1 XF helmet provides holders with protection against electric arcs. In fact, only total coverage of the face by the visor and a minimum thickness can guarantee **full protection of the face from projections and the risks of electrical arcs** (cutting electric panels, removing people from electric vehicles etc.).



+27%
of face
coverage

**Additional protection offered
by Gallet F1 XF Face shield**



Our visors (gilded and clear) are tested to German Standard GS-ET29 (class 1) and EN61482-1-2 for this purpose.

Furthermore, the helmets have been tested according to the standard EN50365:2002 (Insulating helmets for use on low voltage installations).

Guaranteed comfort

The visor has been designed to be sufficiently concave and have intelligent kinematics to increase the distance between the face of the wearer and the visor for maximum comfort.

Wearers of glasses can still wear their glasses under the visor.

The shape of the visor also allows for excellent panoramic vision.

Finally, the 2 versions of the visor (clear and gilded) have anti-fog and anti-scratch coatings.

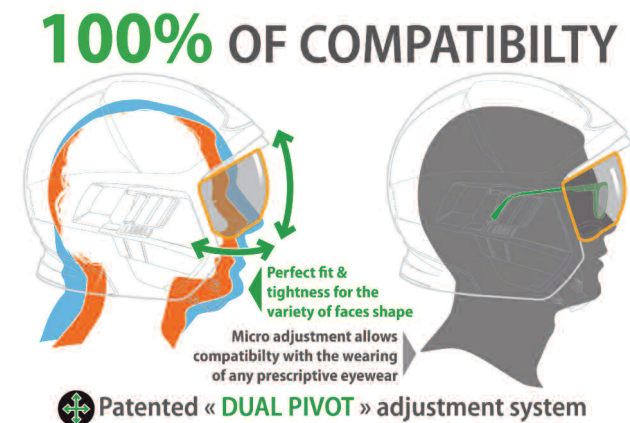


Ocular visor

The unique and patented system enables the visor to be adjusted **accurately to the face** to avoid any risk of projections and to ensure a perfect seal, even when working in conditions with high concentrations of dust.

This 2-dimensional adjustment ensures compatibility with corrective glasses.

It can be replaced in less than 15 seconds without any tools.



Communication system

The Gallet F1 XF can be easily fitted with MSA communication systems (flexible or osteo micro system) as well as with those by other suppliers.

The Gallet F1 XF's flexible microphone system fits perfectly inside the helmet. The length is adjustable for a precise fit over the mouth or SCBA mask speech diaphragm. It also has a standby position for the microphone at the back of the helmet to prevent any accidental glitches after a rescue mission. Finally, its neutralisation system for unwanted background noise ensures the best possible conversation quality.

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Lighting solutions

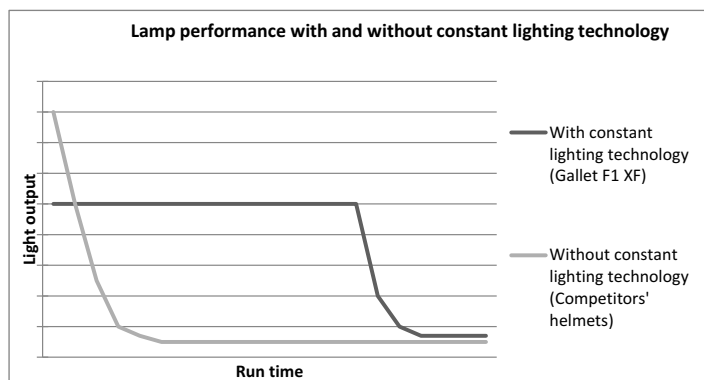
The Gallet F1 XF helmet can be fitted – depending on what each brigade is used to – with flashlights using external lamp supports, on either the right or left.

MSA also offers an **integrated LED module** that can be fitted to the bottom of the helmet in the housing provided for this. It is fitted low down so that the helmet **sits stably on the head** so that **any additional weight is hardly felt at all**.

Located inside the helmet, the module is **protected from potential shocks** (falling objects, collisions, etc.).

This module provides near lighting for reading a map and for moving forwards safely in dark or confined spaces. It is also appreciated for extrication activities at night.

Finally, benefiting from constant lighting technology, the LED module guarantees **consistent light output for 10 hours of autonomous operation**, unlike the majority of competitors' helmet lamps.



MSA flashlight



MSA integrated LED module

Helmet/mask combination



Helmet/mask compatibility is ensured thanks to the **adjustable kit-fix** (external side piece) so that masks with head straps can be fitted. This moveable part can be adjusted to suit the face of the wearer - 3 positions - and to increase or reduce the tension on the face.

Tests were carried out by a certified body in accordance with standard EN136 / DIN58610 involving MSA masks and a number of other masks on the market (test reports available on request)

Internal tests for comfort and sealing have been carried out on a large number of masks with head straps that are available in the market. In addition, MSA mask G1 has flexible straps specifically developed for the Gallet F1 XF to offer optimised comfort and sealing.

The strip can be adjusted: by tipping this part backwards, the front area is freed up so that the sealing skirt of the mask can be correctly positioned.

Similarly, adjusting the suspension height can improve comfort and the sealing of the mask.



3. Compatibility with other equipment

Gloves

The visors can be easily moved with gloved hands, as can the ratchet wheel for the head circumference adjustment strap.

Hoods and neck curtains

Various adjustments can be made quickly to the helmet which means that a hood and different neck curtains can be used without any problems. Simply loosen or tighten the adjusting wheel.

4. Adjustment, weight, ergonomics and comfort

Helmet adjustments



The Gallet F1 XF includes various adjustments to improve comfort next to the jugular, and the strap and height at which the helmet is worn can also be adjusted.

A colour code has been adopted to make it easier to adjust the helmet. So, all adjustable parts are in yellow, which makes it easier and quicker for novice users.

The adjustment wheel is placed inside the helmet shell to avoid it becoming loose by accident during an operation, and to protect it from shocks, heat and flames.

The "star"-shaped adjustment wheel – tested and approved in the field – means it is easy to grasp for making adjustments quickly and easily in all situations.

A quick guide and videos are available on request or on the Internet (MSA channel on YouTube).



Weight distribution

The weight distribution of the Gallet F1 XF is such that it is very comfortable to wear, even during lengthy missions. Even when fitted with its accessories, the helmet remains balanced.

Ergonomics and intelligibility

The design of the helmet shell is widened at ear-level to facilitate communication during an operation when communication systems are not in use. This space also enables communication systems and / or acoustic protection to be incorporated into the shell of the Gallet F1 XF.

CutOff hearing protection integrated in the helmet is the only concept of its kind on the market, ensuring protection from noise while allowing surrounding sounds such as audible alarms or conversation to be heard.

Tests carried out in our acoustics laboratory show that the Gallet F1 XF worn with neither communication system nor acoustic protection changes neither hearing nor communication. Exterior noise attenuation is not evident.



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Comfort

One of the main principles of our R&D has been to work on assembling the elements of the head strap so that it **adapts and adjusts comfortably to all faces**. The following photo shows how the head strap fits closely to the face and the head to limit movement during missions. **What's more, the helmet does not move on the head if the wearer looks up.**

The flexibility of the head strap **optimises the distribution of force** around the head to **avoid headaches and ensure stability and comfort**. All the elements of the head strap have been designed to fit closely to the face of the wearer whatever its form or size. More generally, all the components inside the helmet maximise air circulation. **This prevents wearers feeling 'suffocated' in the helmet.**

The helmet's interior textiles are OEKO-TEX®-certified, ensuring their human ecological credentials. In fact, they are free from toxic products which can harm the body or the environment.



**Breathable fabrics,
maximising air circulation
for maximum comfort**



**Limited sweat absorption
and rapid drying**



Many users involved in developing the helmet

The Gallet F1 XF is designed in such a way as to ensure it is ergonomic and highly stable for the wearer, thereby ensuring unparalleled comfort during all firefighting missions. While the helmet was being developed, MSA involved a wide panel of users across the world to validate each technical item in the specifications as well as its comfort during the various stages of development:

- 145 users during the prototype evaluation phase (in 2011, before the final modifications to the design)
- 125 users during the pre-launch phase on helmet that had already been certified (from May to September 2013), before the launch of the product in November 2013.



MSA asked them to assess the comfort and balance on the head in various working conditions (walking, crawling, climbing stairs and ladders) with and without SCBA.

Many of the participants wore the Gallet F1 XF helmet for more than 10 consecutive hours and none complained of weight, hard points, a sore neck or headaches.

The results of our tests have been very positive with **98% of users who qualified our helmet as "excellent" or "good"**.

During this same test, we asked users with different head circumferences and shapes to try a prototype of the helmet in universal size 52 - 65 cm, and then a prototype in size 52 - 62 cm and another in size 57 - 65 cm. The vast majority of users, including wearers with small and large heads, experienced greater comfort and stability either with size M or size L. This is why, to give priority to comfort and ergonomics, **MSA chose to eliminate the solution of a single-size helmet, which proved not to be suitable for all wearers.** A cushion for wearers whose head circumference is under 52 cm can be fitted to pad out the helmet.

The Gallet F1 XF also demonstrated its high thermal efficiency during tests in a fire box (wooden box), and no wearers reported a sensation of heat around the head. The wide coverage of the impact liner of the Gallet F1 XF, therefore, fully played its role as a thermal barrier.

5. Maintenance

The Gallet F1 XF has a very short maintenance time and a very small number of parts.

The components are grouped into pre-assembled modules to save time and achieve a **disassembly / reassembly time of under 4 minutes**: video available on the MSA channel on YouTube.



6. Overall aesthetic appearance

The F1 signature

The helmet is an external and visible item so that firefighters can be recognised and not confused with other services. The helmet is one of the strong symbols of firefighters. It represents the function and the ideals that are linked with it.

Since 1985 (the date of its creation), the F1 Helmet has been one of the PPE most recognised and appreciated by users throughout the world.

The Gallet F1 XF retains the spirit of the original F1, keeping signature elements of previous generations (crest, visor shape etc.) while bringing a touch of modernity to its lines, giving it a perfect mixture of tradition & dynamism, particularly expected by the younger generations of firefighters.



The model is called Gallet F1 XF because even though the company, Gallet, has been integrated into the structure of MSA, the name Gallet remains a reference in the field, and conveys the values that MSA wanted to associate with this new helmet: **innovation, security, ergonomics and style.**

Finally, the engineers wanted to have an identical design for the both sizes of the Gallet F1 XF helmet, to convey the same image and the same look, regardless of the head circumference or accessories used.

A global success

The Gallet F1 XF helmet **is part of the prestigious range of products designed and manufactured in France and used everywhere in the world**: Fire & Rescue New South Wales / Sydney (7,000 helmets), Hong Kong (9,000 helmets), Amsterdam (several thousand helmets), The Paris Fire Brigade has already put its trust in us (800 helmets).

Since its launch at the national fire brigade conference in Chambéry at the end of 2013, **more than 140,000 Gallet F1 XF** have been delivered throughout the world, proving that its style and protective characteristics that exceed usual standards are appreciated by users.



Developed with you

More than 300 users were involved from the first strokes of the pen to the launch: the aesthetics of the design were approved by users at specific meetings (alpha test then beta test): **almost 90% of users appreciated the style of the Gallet F1 XF.**

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Customising the Gallet F1 XF

Unparalleled expertise in the field of customization of helmets using a hot stamping process: the MSA customisation process is carried out entirely in Chatillon/Chalaronne (France) from the original images/plates via preparation of the ink through to the hot stamping process on each helmet. The print is of high quality, with proven durability and resistance to weather.

Customisation... a real trend in the world of firefighters.

Alongside the customisation of helmets using a hot stamping process, MSA still offers customisation with metal badges attached to front plates or even specific front plates with three-dimensional motifs, the most well-known example being the one worn by all French firefighters.



Lasting aesthetic look and unique know-how



The metallisation of the helmets used to be a sub-contracted process. Since 2016, MSA has invested in a new metallisation line to ensure a metallic, shiny appearance to the Gallet F1 XF helmet.

Whether painted or metallic, the smooth finish provided by the quality of the injected shell allows the application of the paint **without in any way affecting the appearance**.

The helmets are **inspected individually and rigorously** when orders are being prepared to make sure there are no defects.

All functional parts (kit-fix, lamp holders etc.) have a granular surface to limit wear over time.

There are no protruding details or forms that could cause injury to the user while working.

More than a helmet... It's your partner for all your missions

The style of your headset should be analysed considering all the accessories available, because the missions of firefighters increasingly involve voice communication between partners as well as other risks that have so far not been measured: hearing protection and the health of firefighters during missions.

The Gallet F1 XF design also includes specific aspects allowing retro-reflective signalling bands can be added.

Finally, it perfectly incorporates all accessories: an integrated and bidirectional lamp, communication systems are designed not to affect the general design when these accessories are mounted.



When you go in, We go in with you!

MSA offers a complete solution for protecting firefighters, ensuring total compatibility with different equipment:

- Head protection: structural firefighting helmets, technical rescue and wildland fire helmets
- Respiratory protection: SCBA and test equipment
- Portable gas detection equipment: single, multiple, PID gas detectors
- Fall protection: rescue and holding belt, SCBA with fall protection harness, mini personal fall limiters and self-retracting lifelines
- Thermal imaging cameras

Our products can also interact to make your missions even more efficient.



Fall protection



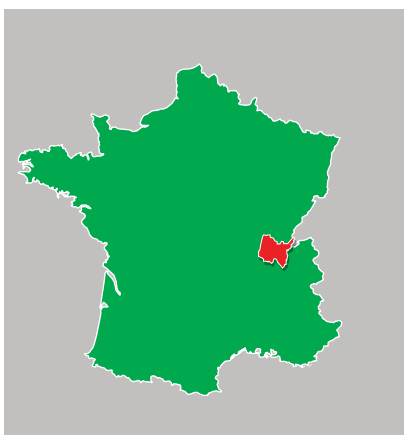
Respiratory protection



Gas detection



Thermal Imaging



A helmet manufactured in France

With more than 2 million F1 helmets sold in more than 80 countries since its creation in 1985 in collaboration with the Paris Fire Brigade, MSA is now the undisputed world leader on the market of helmets for firefighters. Often imitated, never equalled...

Whatever the generation, F1, F1SF or Gallet F1 XF, firefighters are emotionally attached to their F1 helmet – designed and manufactured in France.

In France, more than 250 people are working to ensure your protection: research and development, production, customisation, test laboratory and sales and technical teams.

Your direct contact



For contact details of your local MSA affiliate, please visit our website.