

# I-CART

Individual Capturing of Thermal Risks



Firefighters are exposed to extremely high temperature conditions during interventions, but due to the sense-muting effects of their protective clothing, are unable to tell in time when they are at serious risk of being burned. To reduce the number of burn injuries sustained by firefighters, the I-CART project seeks to create a robust sensor-equipped garment that warns the firefighter when they are in harm's way, giving them essential time to react or retract from the intervention.

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## Reactivating the senses

The human body reflexively moves away from heat sources, but because of the insulative properties of the fabrics worn by firefighters, their sense of temperature is disturbed. A recent study has shown that adrenaline suppresses the skin's ability to sense temperature and pain. The combination of firefighting garments and high levels of adrenaline leaves firefighters unable to assess the risk and occurrence of burn injuries. Burn wounds keep firefighters out of service until they are fully healed, which has both economic and societal consequences.

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## Accurate, reliable and robust protective gear

The consortium's six partners will combine their expertise in sensors, hardware design, software design, electronics and protective clothing manufacturing to achieve four innovation goals:

1. Design a protective garment fitted with sensors that satisfies the EN469 or ISO EN 11612 standards for fire protection performance, and passes the ISO6942 test method;
2. Reduce 3rd degree burns sustained by firefighters by 50%, 2nd degree by 30% and 1st degree by 15%;
3. Develop a delay-free workflow for donning and using the garment;
4. Ensure the solution is 99.99% reliable over 5 years of use.

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## Enabling new products that save lives

I-CART consortium partners will use the developed technology and expanded knowledge base to offer new products and expand into new markets. The solution itself will lead to fewer injuries and associated costs. It is also relevant to other applications of protective garments in healthcare, sports, manufacturing, high-risk professions and more.

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I-CART is an imec.icon research project funded by Agentschap Innoveren & Ondernemen and imec.

It started on 01.10.2017 and is set to run until 30.09.2019.

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## Project information

### Industry

- Sioen
- Connect Group
- BSPP – Brigade of firefighters of Paris

### Research

- imec – CMST
- imec - IDLab – UGent
- imec - EA

### Contact

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