

# Mobile camouflage system and combined camouflage system for support vehicles

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# ***B.O.I.S. – FILTRY MAIN ACTIVITIES***

- **Military foreign trade**
- Development and production of washable NBC protective suits
- Development and production of multispectral camouflage systems
  - Personal camouflage
  - Multispectral sun screen
  - Multispectral camouflage nets
  - Multispectral mobile camouflage



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## Air-permeable protective suits

Protection of body surface against :

- vapours, aerosols and droplets of chemical warfare agents,
- radioactive dust,
- biologically active particles



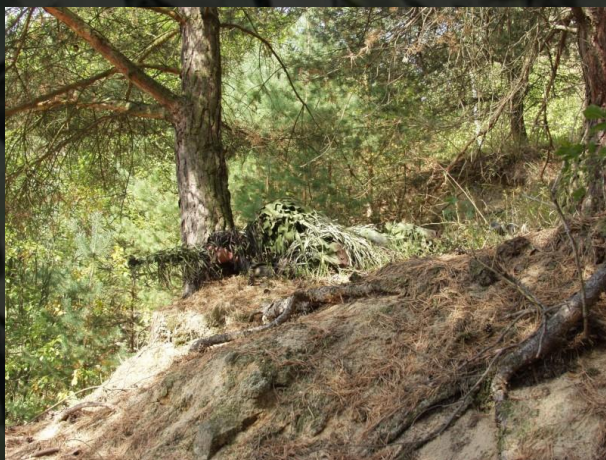


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## Personal Camouflage

These multispectral camouflage means are intended for special troops (e.g. scouts or snipers) in the visual and infrared (near, medium, far) regions. They are produced in two basic designs: poncho and overall. Their high variability enables extensive adjustments according to particular user requirements.









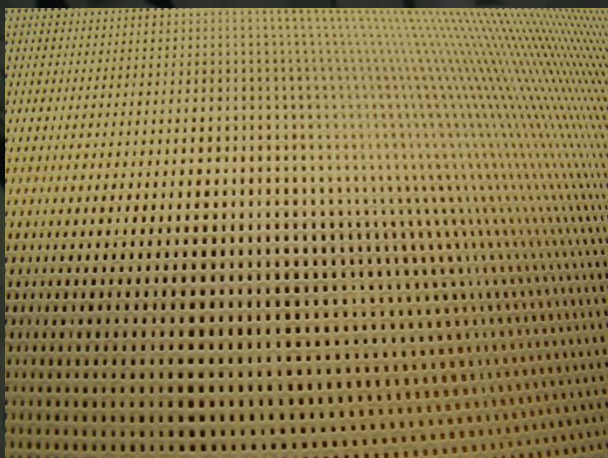
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## Multispectral sun screen

This group of products is intended for both reduction of solar radiation and camouflage of mobile and stationary objects in the visible, near infrared and medium infrared regions. The multispectral screens reduce temperature of the object to the temperature of air.





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## Multispectral camouflage nets

This group of products is intended for camouflage of mobile and stationary objects in the visible, infrared (near, medium, far), and microwave regions. Camouflage nets have a modular structure, which enables the operator to achieve the required size by using different configurations. They are delivered in three basic designs (summer, winter, and desert), supplemented with a number of special alternatives.





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## Multispectral mobile camouflage

This group of products is intended for camouflage of vehicles in the visible, infrared (near, medium, far) and microwave regions. The mobile camouflage is always designed for a given type of vehicle and consists of elements tailored to its specific part. The mobile camouflage does not hinder the manoeuvrability, use of weapons and access to accessories and handles. It can be easily and fast dismantled which enables standard vehicle maintenance.









# Outline

What is combined camouflage  
Results from far infrared region  
Results from medium infrared region  
Results from radar  
Conclusion



TATRA truck T810 6x6 offroad  
Mobile camouflage MM-BF/L summer  
Additional camouflage net M-BF/L summer

1.6. 2011 Vyškov Army training centre  
Morning and early afternoon hours  
Air temperature 22 °C  
Reflected temperature 20 °C  
Humidity 70%  
530 m distance

Medium infrared 3-5  $\mu\text{m}$   
AGEMA Thermovision 550  
Far infrared 8-12  $\mu\text{m}$   
FLIR ThermaCAM P20  
FLIR Reporter 8.5 Professional

Radar monostatic puls radar 9.41 GHz  
Power 3 kW, puls length 45 ns,  
Linearly polarized horizontal and vertical

# Static x Mobile

- + Simple
- + Modular
- + Versatile
- + Easy to instal and use
- + Changes shape
- + Universality

- Immobile

+ Mobile

- Not the whole area could be covered
- No shape changes
- Specifically designed to specific vehicle
- Instalation required



# Static x Mobile

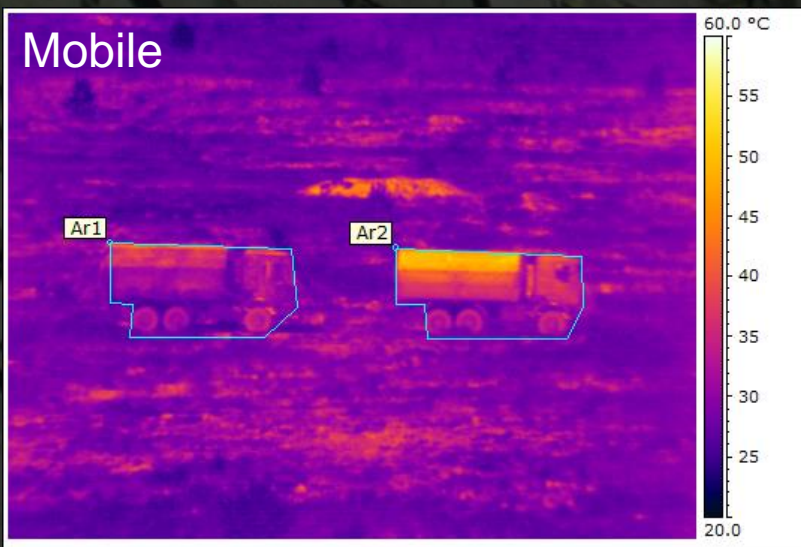


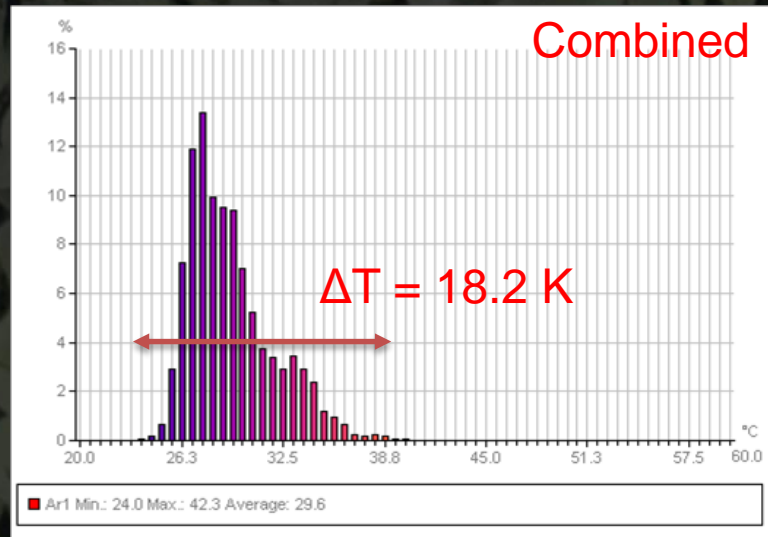
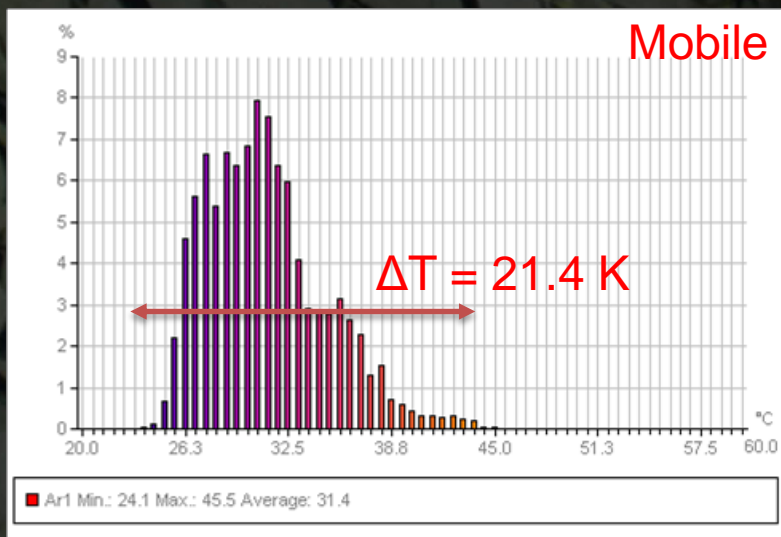
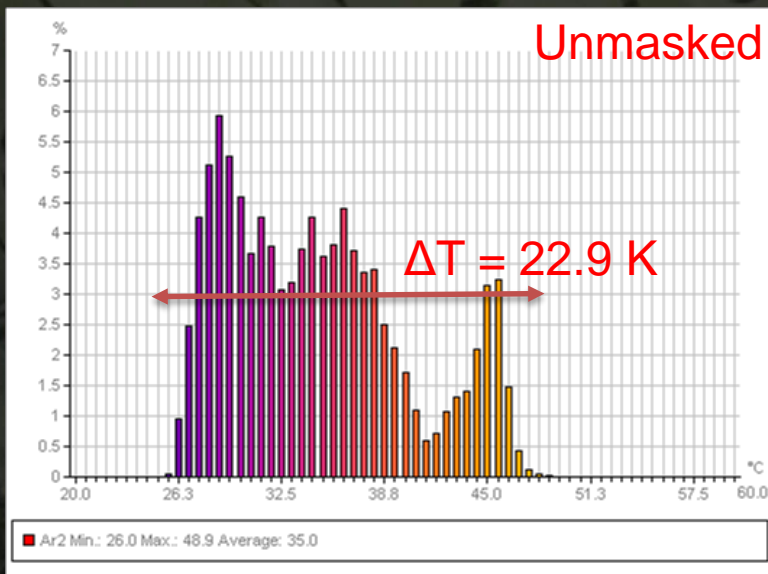
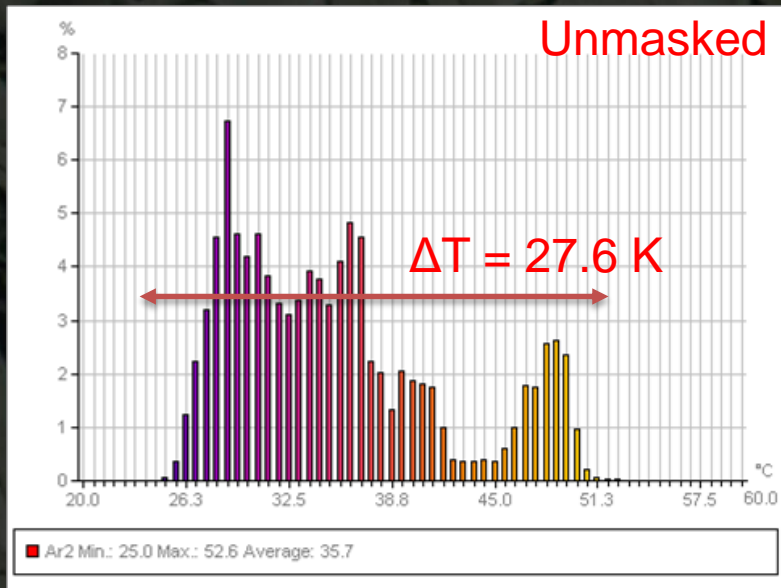


# Combined camouflage

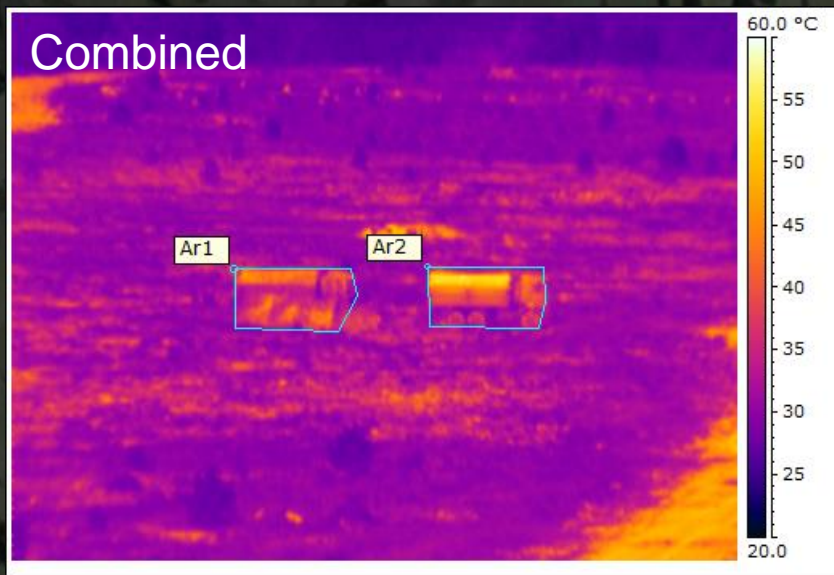
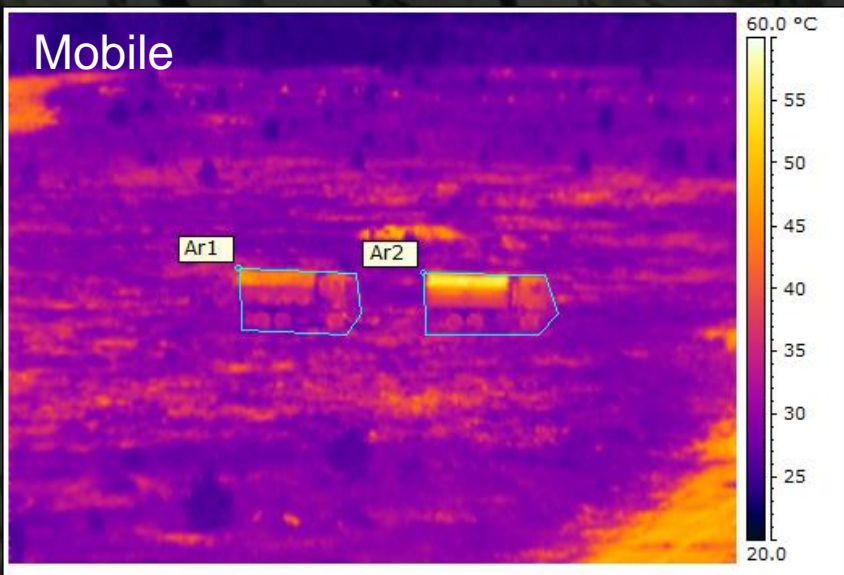


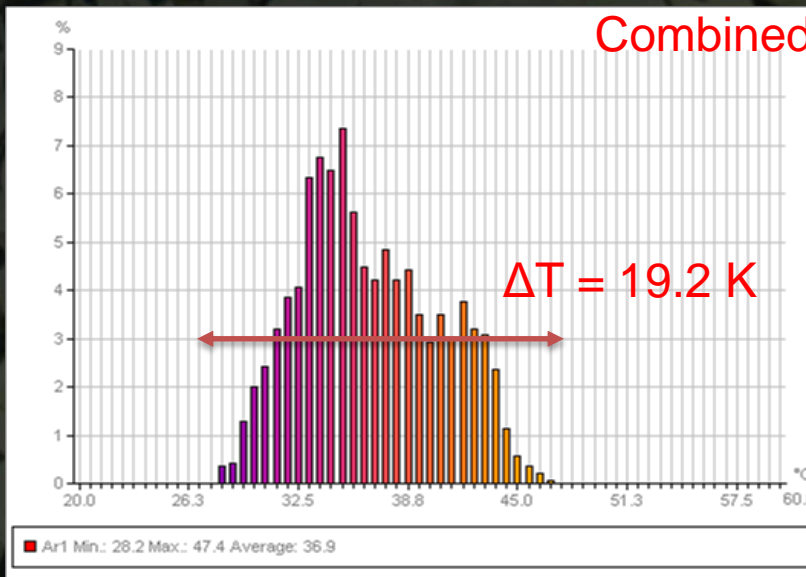
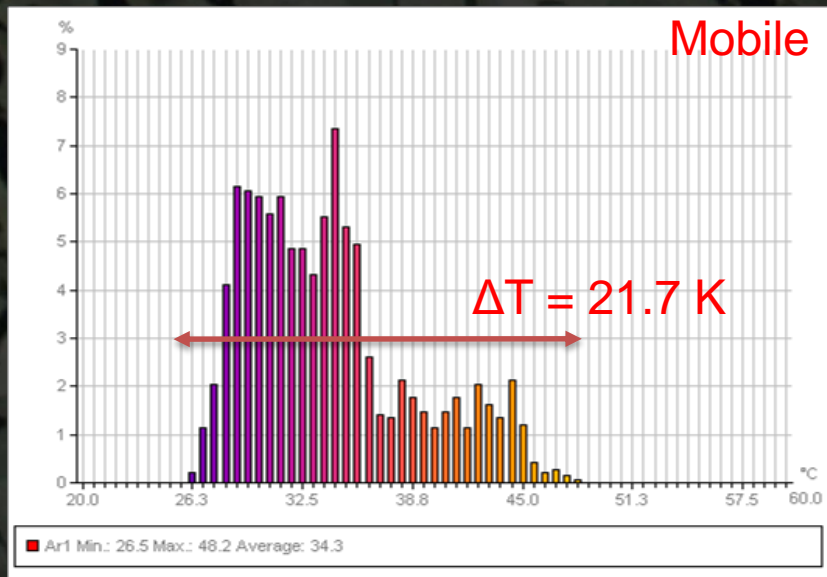
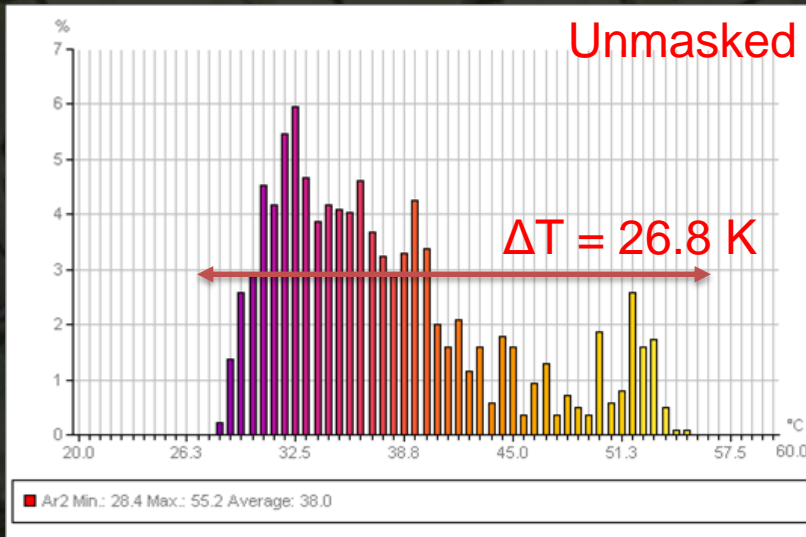
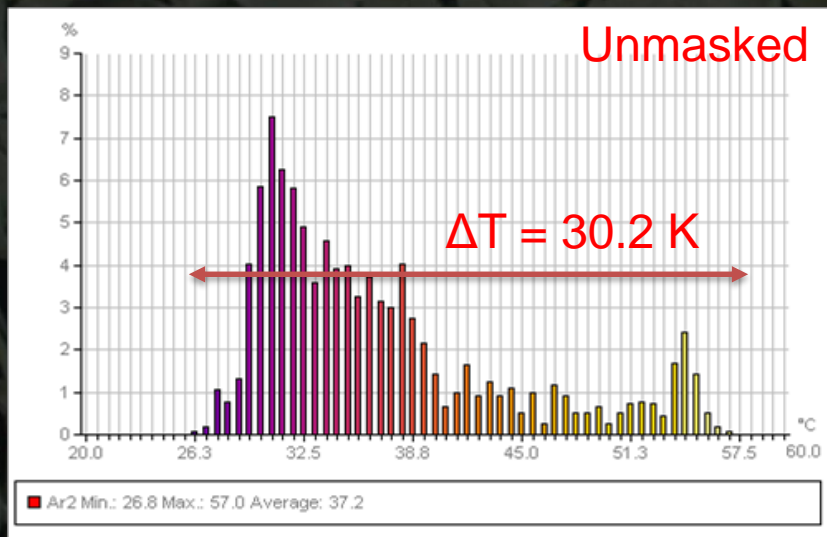








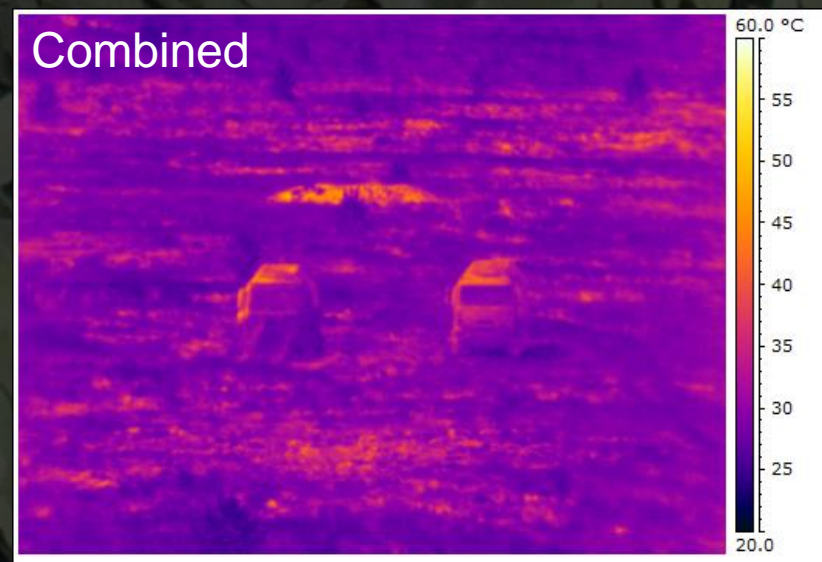
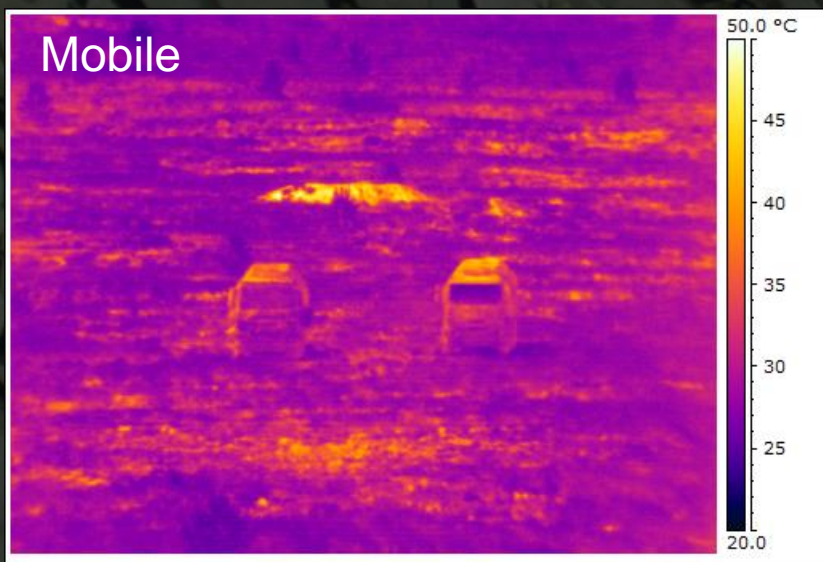
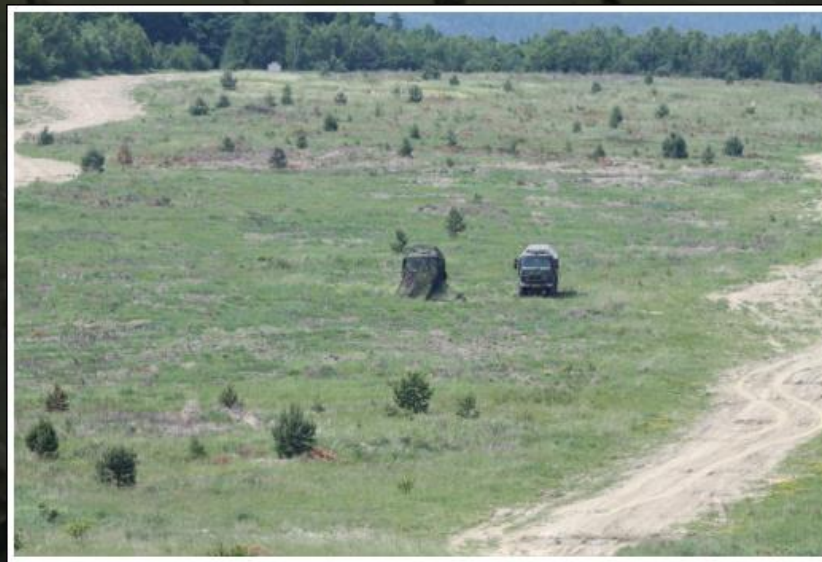




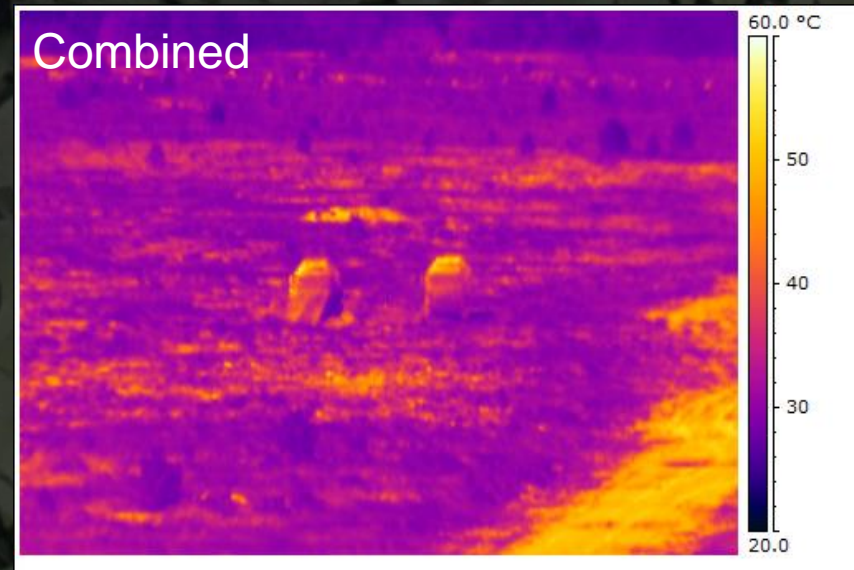
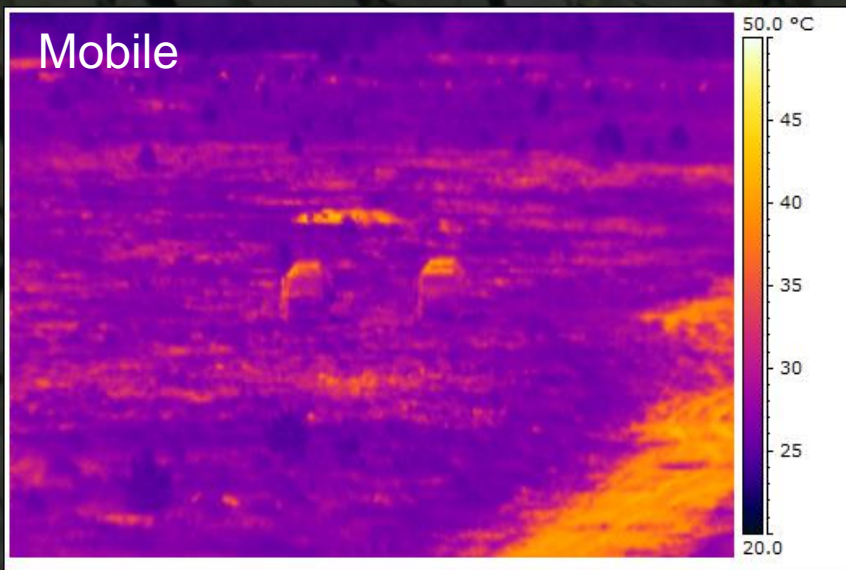


# Results

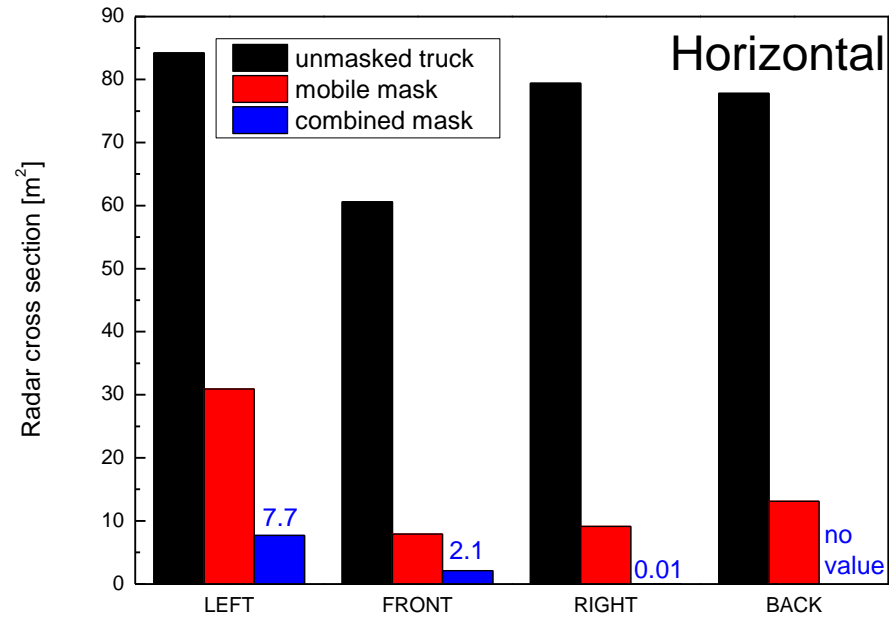
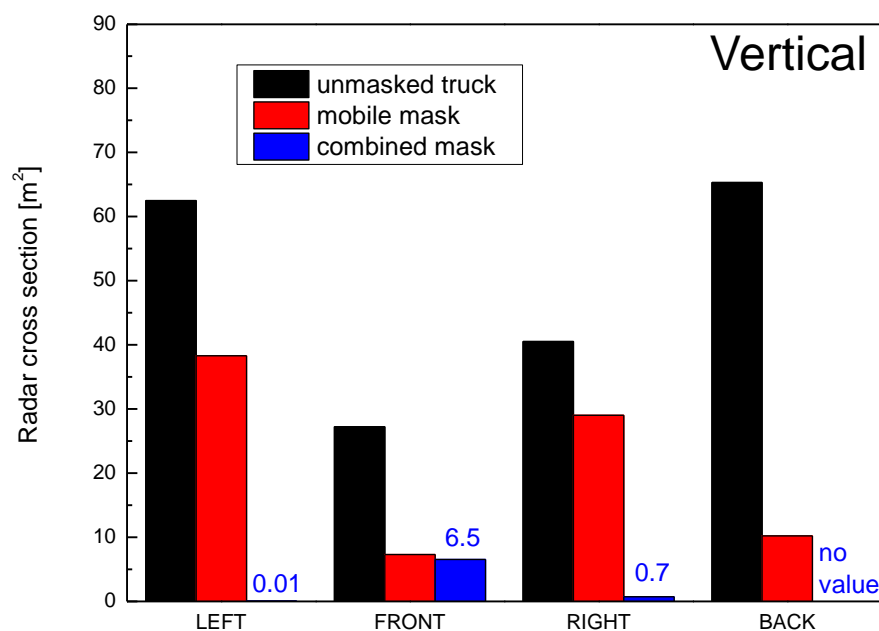
8-12  $\mu\text{m}$









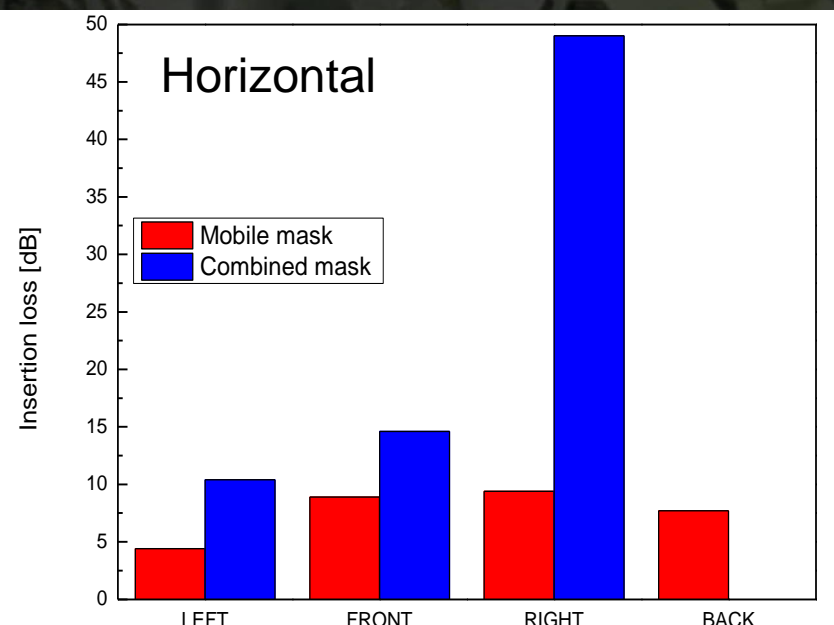
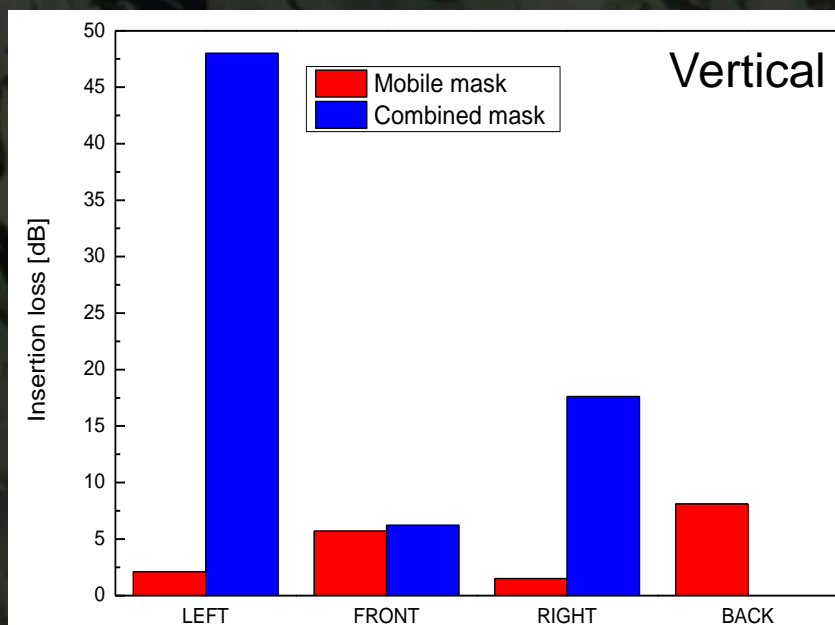


Left and right not identical  
 Front smaller  
 Back high – should not be exposed

Vertical [%]			Horizontal [%]		
	Mobile mask	Combined mask		Mobile mask	Combined mask
LEFT	39	99.9	LEFT	63	91
FRONT	73	76	FRONT	87	97
RIGHT	28	98	RIGHT	89	99.9
BACK	84	---	BACK	83	---

$$RCS_{decrease} = \frac{\sigma_{masked}}{\sigma_{unmasked}} \cdot 100 [\%]$$

$$L_{RCS} = 10 \log \left( \frac{\sigma_{masked}}{\sigma_{unmasked}} \right) [\text{dB}]$$





# Conclusion !

Both types of camouflage improve significantly all measured quantities compared to unmasked vehicle

Combined camouflage is better than mobile camouflage in radar and in far infrared

# Conclusion ?

Is there a clear answer which camlouflage is the best?

No camouflage fits all situations

Inform and educate military professionals about all options so they are able to make informed decisions and react to changing situation





650 m, moving vehicle





300 m, moving vehicle





standing vehicle in combined camouflage, close up



Thank you for your attention

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**ISO 9001:2016**

**NCAGE 2552G**

**AQAP 2110**