



Technical and Sales Proposal Training IRT

Date: June 18th, 2020

Designated Persons: NDT technicians from the Aerospace industry (manufacturing and maintenance)

Purpose : Training in **THERMOGRAPHY level 1 – applicable to composite** during **32 hours** according to **EN4179**.

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Mrs., Mr.,

According to your request, we can offer the training detailed on the next page with the below conditions.

If you give your agreement for this proposal, please return the part on page 2 completed and signed.

MPP offers this training in its office with respect of the sanitary recommendations.

We are available for any complementary information you may need.

Your contacts :

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Sales director
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Regards,

JC Montanier
Sales director

1) Proposal

<u>Title :</u> Training Thermography level 1 – applicable to composite according to EN4179	<u>Duration :</u> 4 days, either 32 hours
<u>Training reference :</u> 2020IRT01	<u>Training location :</u> <i>Parc Industriel des Hauts Sarts 1^{ère} avenue, 66 4040 Herstal - Belgique</i>
<u>Trainer :</u> Mr Pierre Servais Doctor in Sciences NDT, level 3 IRT	<u>Dates :</u> From Monday July 6th to Thursday 9th, 2020
<u>Offer date :</u> June 18th, 2020	<u>Language :</u> <i>English</i>
<u>Room :</u> main training room	<u>Time :</u> From 08h30 to 16h30

Please fill below

Total number of participant :	<u>Split :</u> <ul style="list-style-type: none"> • worker(s) • employee(s) • manager(s)
<u>Name :</u>	<u>Company :</u>
<u>First name :</u>	<u>Company stamp or signature and name of responsible</u>
<u>Position :</u>	
<u>Date :</u>	

Training details : THERMOGRAPHY 32 HOURS**1st Day**

Morning :	After-noon :
Welcome. Introduction - Basis : Thermography, thermo imagery, photometry.	General principle of Pulse Active Thermography inspection by reflection and transmission.
Thermography definition, - The temperature : relations with heat. Heat Measurement. Units.	Practical work : use of thermal camera FLIR on CRFP official samples and Honeycomb
Transfer mode Energy : Conduction, Convection, Radiation.	Review of the various camera parameters – practical work on live image
Various thermography applications fields. Applications in the transportation field (aerospace, navy, railway).	Use of various visual possibilities on a thermal scene. – Defects analysis – Temperature Profile - 3D view – Ratio signal/noise

2nd Day

Morning :	After-noon :
Thermography complementarity with other NDT methodologies (Ultrasonic – X-Ray)	Practical work : use of active thermography on test samples and real defects.
Various types of detectable defects : delamination, bonding defects, presence of air, inclusion of water, inclusion of foreign bodies	Adjustment of the focus, the heating distance and the duration of the heat pulse
The electromagnetic spectrum	Infrared image recordings
The characteristics of infrared radiation. (Planck's law - Wien's law)	Use of thermal image reading software - post processing analysis
Spectral luminance and photometric and radiometric units	Adjustment of the display scale (min threshold, max threshold, false colors)

3rd Day

Morning :	After-noon :
Spectral transmittance of the atmosphere	Practical work : Manual mode setting of the camera
Influence of relative humidity and ambient temperature	Verification of the different temperature ranges
Study of Planck curves and Planck's law	Recording of thermal sequences in video format
Characteristics of a black body at different temperatures	Reading and analysis of an IR video sequence of active thermography

4th Day

Morning :	After-noon :
Influence of parasitic reflection in thermography, emissivity, environment temperature, surface condition of the part	Aero composite applications: drafting of a standard control instruction for applications
Technology of different infrared sensors: optics, scanning, detector, focal plane array, microbolometer technology, cooling	Putting each of the participants into practice on different IR cameras (practical examination with fault report on an existing pro-format with measurement of the size of the faults)
Detailed analysis of thermal camera specifications	Multiple Choice Theoretical Exam 40 Questions about Infrared Thermography NDT