


Schedule: 17th MFN Asian Shot Peening Workshop 2017

BASIC / L1: 5th of December, 2017 Description about the courses at: www.mfn.li/workshop/courses

| Time | Subject | Course | Official MFN Trainer |
|------------------------------|---|--------------------------------------|----------------------|
| 8:00-8:10 | -Official Opening of Basic Course / L1 | ----- | Giovanni Gregorat |
| 8:10-8:55 | -Introduction to Peening | Basic, FAA C-IND-IM-120312-K-006-001 | Francois Abadie |
| 8:50-9:30 | -Intensity L1 | Basic, FAA C-IND-IM-120312-K-006-001 | Giovanni Gregorat |
| Morning Break (35 minutes) | | | |
| 10:05-10:45 | -Coverage L1 | Basic, FAA C-IND-IM-120312-K-006-001 | Francois Abadie |
| 10:45-11:25 | -Engineering, Planning, Documentation | Basic, FAA C-IND-IM-120312-K-006-001 | Francois Abadie |
| Lunch Break (45 minutes) | | | |
| 12:10-12:50 | -Masking | Basic, FAA C-IND-IM-120312-K-006-001 | Giovanni Gregorat |
| 12:50-13:30 | -Peening Media L1: Characteristics and Specifications | Basic, FAA C-IND-IM-120312-K-006-001 | Giovanni Gregorat |
| Afternoon Break (30 minutes) | | | |
| 14:00-14:40 | -Preparing for Shot Peening Audits | Basic, FAA C-IND-IM-120312-K-006-001 | Giovanni Gregorat |
| 14:40-15:05 | -Repetition Basic Shot Peening Course | Basic, FAA C-IND-IM-120312-K-006-001 | All MFN Trainers |
| 15:05-15:45 | -Test for FAA approved Certificate | Basic, FAA C-IND-IM-120312-K-006-001 | All MFN Trainers |


BASIC / L1: Separate Evening Course for Practical Shot Peening

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|-------------|--|---|------------|
| 16:00-18:00 | Media Evaluation 1. Equipment / Hardware Review a) Sieves, b) Rotap Separator, c) 20X Microscope 2. Exposure to different media types a) Cast Steel, b) Conditioned Cut Wire – different conditioning levels, c) Glass, d) Ceramic 3. Spec Requirement Review a) Spec navigation – AMS 2430/AMS2432 vs AMS2431 4. Sieve Analysis a) Conduct sieve analysis different media types 5. Examination of Deformed shot a) Review criteria for defective particles, b) Conduct fracture counts |  <p style="text-align: center;">CNC machine used in training</p> | Jim Whalen |
|-------------|--|---|------------|

INTERMEDIATE / L2: 6th of December, 2017 Description about the courses at: www.mfn.li/workshop/courses

| Time | Subject | Course | Official MFN Trainer |
|------------------------------|--|---|----------------------|
| 8:00-8:10 | -Official Opening of Intermediate Course / L2 | ----- | Giovanni Gregorat |
| 8:10-8:55 | -Intensity L2 | Intermediate, FAA C-IND-IM-120312-K-006-002 | Giovanni Gregorat |
| 8:50-9:30 | -Coverage L2 | Intermediate, FAA C-IND-IM-120312-K-006-002 | Francois Abadie |
| Morning Break (35 minutes) | | | |
| 10:05-10:45 | -Wheel Peening Machines & Equipment | Intermediate, FAA C-IND-IM-120312-K-006-002 | Francois Abadie |
| 10:45-11:25 | -Air Peening & Nozzles | Intermediate, FAA C-IND-IM-120312-K-006-002 | Francois Abadie |
| Lunch Break (45 minutes) | | | |
| 12:10-12:50 | -Flap Peening (“hands-on”) | Intermediate, FAA C-IND-IM-120312-K-006-002 | Francois Abadie |
| 12:50-13:30 | -Peening Media L2: Specification & Quality Control | Intermediate, FAA C-IND-IM-120312-K-006-002 | Giovanni Gregorat |
| Afternoon Break (30 minutes) | | | |
| 14:00-14:40 | -Shot Peening in the Automotive Industry | Intermediate, FAA C-IND-IM-120312-K-006-002 | Francois Abadie |
| 14:40-15:05 | -Repetition for Intermediate Shot Peening Course | Intermediate, FAA C-IND-IM-120312-K-006-002 | All MFN Trainers |
| 15:05-15:45 | -Test for FAA approved Certificate | Intermediate, FAA C-IND-IM-120312-K-006-002 | All MFN Trainers |

INTERMEDIATE / L2: Separate Evening Course for Practical Shot Peening


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| 16:00-18:00 | Machine Components and Intensity Determination 1. Equipment / Hardware Review a) Robotic Shot peening machine: Review major machine components (Robot / spindle; Reclaim / sieve); Review Process controls (Air, Shot, Velocity); Review Process monitoring software b) Almen Strips and Holders: Different almen strip types A, N, C; Blocks and types; Types of Almen fixtures (Photos) 2. Generate a simple almen strip program with a single block on the turntable a) Run various almen strips b) Plot curve manually and via automated curve method c) Demonstrate how changing parameters (air pressure, shot flow, angle) affect peening intensity |  <p style="text-align: center;">CNC machine used in training</p> | Jim Whalen |
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Schedule: 17th MFN Asian Shot Peening Workshop 2017

ADVANCED / L3: 7th of December, 2017 Description about the courses at: www.mfn.li/workshop/courses

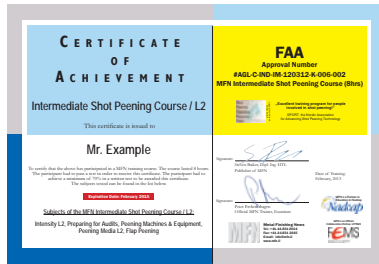
| Time | Subject | Course | Official MFN Trainer |
|------------------------------|--|---|----------------------|
| 8:00-8:10 | -Official Opening of Advanced Course / L3 | ----- | Francois Abadie |
| 8:10-8:55 | -Residual Stresses & their Measurement | Advanced, FAA C-IND-IM-120312-K-006-003 | Markus Laakkonen |
| 8:50-9:30 | -Fatigue Stress Corrosion in Metals | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| Morning Break (35 minutes) | | | |
| 10:05-10:45 | -Optimization of Shot Peening | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| 10:45-11:25 | -Shot Peening Process Improvement | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| Lunch Break (45 minutes) | | | |
| 12:10-12:50 | -New Peening Technology: Laser Peening, Ultrasonic Peening, Cavitation Peening | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| 12:50-13:30 | -Introduction to Deep Rolling | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| Afternoon Break (30 minutes) | | | |
| 14:00-14:40 | -Nanostructured Surfaces Obtained by Severe Shot Peening | Advanced, FAA C-IND-IM-120312-K-006-003 | Francois Abadie |
| 14:40-15:05 | -Repetition Advanced Shot Peening Course | Advanced, FAA C-IND-IM-120312-K-006-003 | All MFN Trainers |
| 15:05-15:45 | -Test for FAA approved Certificate | Advanced, FAA C-IND-IM-120312-K-006-003 | All MFN Trainers |

ADVANCED / L3: Separate Evening Course for Practical Shot Peening

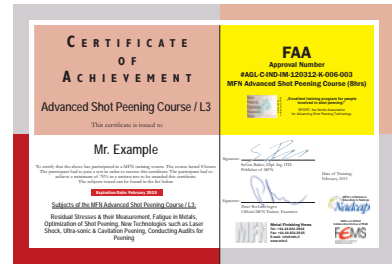
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|-------------|--|---|------------|
| 16:00-18:00 | Coverage Determination and Part Programming Techniques 1. Equipment / Hardware Review a) Coverage: 20X, 10X Visual; Tracer b) Peening Nozzles: Rotary Lance; Deflector Nozzles 2. Coverage evaluation a) Develop simple program to simulate peening the table top two ways varying the feedrate as you move from ID to OD and then at a fixed feed rate: Peen aluminum coverage coupons; Peen various hardness materials to demonstrate different views of coverage. 3. Advanced Intensity and Coverage a) Verify Rotary Lance peening intensity b) Develop programs for multi strip fixture to create uniform intensity c) Coverage mapping on complex geometry parts |  <p style="text-align: center;">CNC machine used in training</p> | Jim Whalen |
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Basic / L1 Certificate indicating FAA Ref. Nr.



Intermediate / L2 Certificate indicating FAA Ref. Nr.



Advanced / L3 Certificate indicating FAA Ref. Nr.



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Markus Laakkonen
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