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ULTRASONIC IMPACT TREATMENT - APPLICATION FOR BRIDGES

FOR FATIGUE LIFE IMPROVEMENT OF BRIDGE WELDS

- Improved fatigue life of welded components
- Increased resistance to Stress Corrosion Cracking (SCC)
- Portable equipment for preventive treatment or maintenance

NOMAD PORTATIVE SYSTEM UIT/HFMI

Ultrasonic Impact Treatment or
High Frequency Mechanical Impact

◄ Example of application:
Floor beam connection
George Washington Bridge

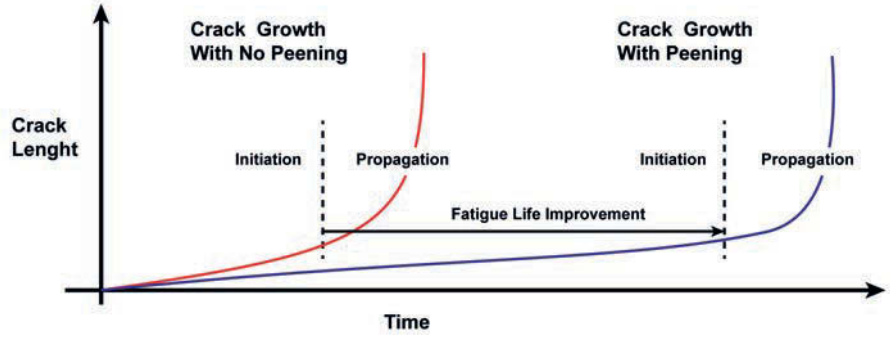
NOMAD system ►
STRESSONIC® technology
inside, in portative
wheeled case.

WHY IS FATIGUE LIFE IMPROVED AFTER UIT?

- Because the Ultrasonic Impact Treatment (UIT) acts on both weld weakness origins to delay crack initiation:

  → Inverse the Internal Residual stresses

  → Modify the geometry



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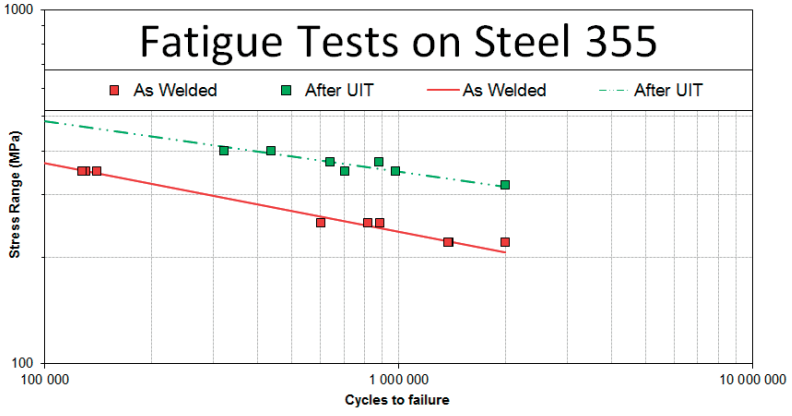
Due to increasing traffic and higher loading, fatigue becomes of high importance in maintaining the integrity of existing steel bridge structures (Extended LifeTime, associated Cost Savings and Safety).

Repair and strengthening of welded details, which are often where the cracks are initiated are thus of great importance.

The needle peening efficiency had been demonstrated through hundreds of evaluation programs worldwide. It can increase life up to 10 times and more (depending on the weld quality, the material and the load).



Published proven efficiency results has conducted in the United States to the addition of a dedicated chapter about UIT within the AASHTO LFRD Interim 2008 Issue.

ADVANTAGES OF ULTRASONIC IMPACT TREATMENT

Extend fatigue life

- Remove the notch effect
- Add compressive stresses
- Alternative to Grinding, TIG dressing and Pneumatic hammering
- Increased resistance to Stress Corrosion Cracking (SCC)

Simplicity and comfort

- Minimum training required
- Handheld, compact and light
- Low vibration
- No water cooling

Functionalities

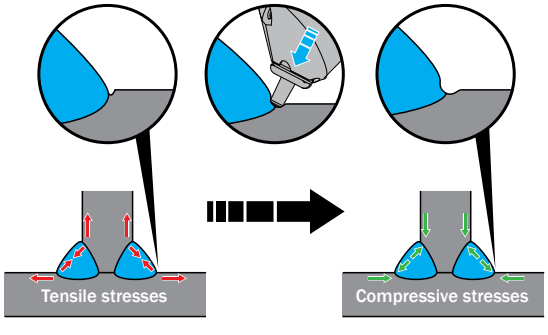
- Rugged industrial tool
- Adaptable peening heads
- Low energy and compressed air consumption
- Ergonomic design

Perfect control

- Digital ultrasonic generator
- Real-time control of parameters
- Specific tooling for control

ULTRASONIC IMPACT TREATMENT PRINCIPLE

Weld toe notch area and heat affected zone to be treated by Ultrasonic Needle Peening.



Weld toe geometry modification

Inversion of Residual Stresses

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