



Integrity Testing Laboratory Inc.

80 Esna Park Drive, Units 7-9, Markham, Ontario, L3R 2R7,
Canada

Tel: +1-905-415-2207; Fax: +1-905-415-3633; website: www.itlinc.com; e-mail: info@itlinc.com

Ultrasonic Peening (UP) Improvement Treatment for Automotive Applications

The **Ultrasonic Peening (UP)** is the most efficient and cost-effective improvement treatment as compared with such traditional techniques as grinding, TIG-dressing, heat treatment, hammer peening and shot peening.

UP could be applied successfully in numerous applications:

- Increasing the fatigue life of materials, parts and welded elements
- Eliminating distortions caused by welding and other technological processes
- Relieving and/or removing residual stresses
- Increasing the surface hardness of materials
- Preventing stress corrosion cracking
- Inducing surface nanocrystallization
- Etc.



Installation by ITL engineers of a robotic version of the UltraPeen™ instrument onto a robot.



Manual UP instrument UltraPeen™ (shown with an optional laptop computer)

Ultrasonic Peening (UP) could be successfully applied to parts and components in Automotive Industry:



- Steel welded wheels
- Aluminum wheels
- Springs
- Chassis
- Gears / Splines
- Brake drum

- Rotors
- Flywheels
- Yokes
- Connecting rods
- Crankshafts
- Camshafts, etc.

Different metals could be treated efficiently by UP

- Carbon Steel
- High Strength Steel
- Stainless Steel
- Cast Iron
- Aluminum Alloys

- Manganese Steel
- Titanium Alloys
- Nickel Alloys
- Copper Alloys
- Cobalt Alloys etc.



Steel welded wheel and aluminum wheel improved by Ultrasonic Peening

Robotized UP treatment of an aluminum wheel.

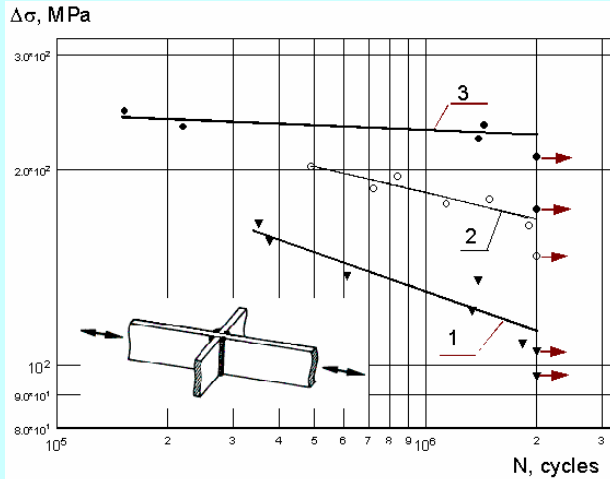
UP was used to prevent possible air leakage and to increase the fatigue life three times



UP treated weld connecting rim and disc of a welded wheel.

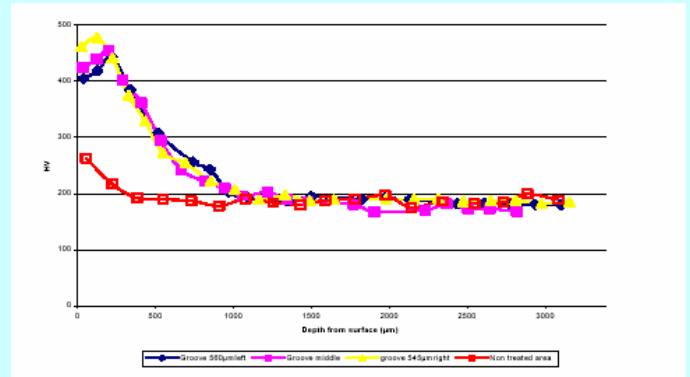
Fatigue testing demonstrated a four-fold increase in fatigue life after UP treatment

Relieve of Residual Stesses



Fatigue curves of non-load carrying fillet welded joint: 1 - in as-welded condition; 2 and 3 - after application of the UP by using technology A and technology B (optimized)

Nanocrystalization of surface layers



Microhardness depth-profile distributions in different locations of a sample treated by Ultrasonic Peening

Elimination of Distortions



T-welded two 6 mm steel plates: before UP treatment



T-welded two 6 mm steel plates: after UP treatment

About Us:

Integrity Testing Laboratory (ITL) Inc. offers testing of materials; development and evaluation of coatings; failure analysis and assistance in development of welding materials, equipment and control systems; design and evaluation of welded structures and components; and development of methods and equipment for non-destructive testing and evaluation.

For further information contact us:

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