# New Ultrasonic Technologies for Structural Integrity Improvement

The Structural Integrity Technologies Inc. (SINTEC) is a world leader in the development and industrial application of ultrasonic technologies for fatigue life improvement and residual stress measurement. SINTEC manufactures and provides equipment for ultrasonic impact treatment (UIT/UP) of parts and welded elements and for ultrasonic measurement (UM) of residual and applied stresses.

### **Ultrasonic Impact Treatment (UIT/UP)**

The most efficient fatigue improvement technique



UIT/UP of welds in mining equipment



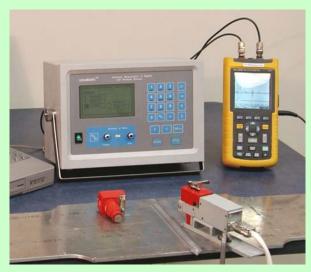
Ultrasonic Peening system UP-600

## Ultrasonic Measurement (UM) of Residual and Applied Stresses

Effectively used in laboratory and field conditions



Measurement of residual stresses in a welded bridge



System UltraMARS<sup>TM</sup> for residual stress measurement



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## **SINTEC - Improving Reliability and Endurance**

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#### **Publications**

#### **Selected Recent**

- Y. Kudryavtsev and J. Kleiman. Increasing Fatigue Strength of Welded Joints by Ultrasonic Impact Treatment. *International Institute of Welding. IIW Document XIII-2338-10. 2010.*
- Y. Kudryavtsev and J. Kleiman. Measurement of Residual Stresses in Welded Elements and Structures by Ultrasonic Method. *International Institute of Welding. IIW Document XIII-2339-10. 2010.*
- Y. Kudryavtsev, J. Kleiman and Y. Iwamura. Fatigue Improvement of HSS Welded Elements by Ultrasonic Peening. *Proceedings of the International Conference on High Strength Steels for Hydropower Plants, July 20-22, 2009. Takasaki, Japan.*
- Y. Kudryavtsev. Residual Stress. Springer Handbook on Experimental Solid Mechanics. Springer SEM. 2008. P. 371-387.
- Y. Kudryavtsev and J. Kleiman. Fatigue of Welded Elements: Residual Stresses and Improvement Treatments. *Proceedings of the IIW International Conference on Welding&Materials. July 1-8*, 2007, Dubrovnik, Croatia. P. 255-264.
- Y. Kudryavtsev. Ultrasonic (Hammer) Peening. Handbook on Residual Stress. Edited by Jian Lu. Volume 1. SEM. 2005. p. 160-169.
- Y. Kudryavtsev, J. Kleiman, O. Gushcha, V. Smilenko and V. Brodovy. Ultrasonic Technique and Device for Residual Stress Measurement. *X International Congress and Exposition on Experimental and Applied Mechanics. Costa Mesa, California USA, June 7-10, 2004. (on CD)*
- Y. Kudryavtsev, J. Kleiman and O. Gushcha. Ultrasonic Measurement of Residual Stresses in Welded Railway Bridge. *Structural Materials Technology: An NDT Conference*. *Atlantic City*. *NJ. February* 28-March 3. p. 213-218. 2000.

#### Selected Historical

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- Y. Kudryavtsev, V. Korshun and A. Kuzmenko. Improvement of Fatigue Life of Welded Joints by Ultrasonic Impact Treatment. *Paton Welding Journal*. 1989. No. 7. p. 24-28.
- Y, Kudryavtsev et all. Increasing of Fatigue Strength of Welded Joints in Cyclic Compression. *International Institute of Welding. IIW Document XIII-1569-94.* 1994.
- Y. Kudryavtsev, P. Mikheev and V. Korshun. Influence of Plastic Deformation and Residual Stresses Created by Ultrasonic Impact Treatment on Fatigue Strength of Welded Joints. *Paton Welding Journal*. 1995. No. 12. p. 3-7.
- Trufyakov V., Mikheev P. and Kudryavtsev Y. Fatigue Strength of Welded Structures. Residual Stresses and Improvement Treatments. *London. Harwood Academic Publishers GmbH.* 100 p., 1995.
- Trufiakov V. I., Mikheev P. P., Kudryavtsev Y. F. and Statnikov E. S. Ultrasonic Impact Treatment of Welded Joints. *International Institute of Welding. IIW Doc. XIII 1609 95. 1995*.