Department of Metallurgy and Materials Engineering

KATHOLIEKE UNIVERSITEIT LEUVEN

Ultrasonic C-scan

Description:

The high frequency ultrasonic C-scan is a non-destructive technique to examine defects inside a material. This apparatus permits researchers to identify the depth of the observed defect in the sample. This capability makes it a valuable tool to monitor the precise location of delaminations between certain plies, caused by impact or fatigue loading.

Principle:

A very high frequency signal (up to 50 MHz) is transmitted to the sample by a (focused) transducer. The sample and the transducer are submerged in water that serves as the coupling medium. The initial signal is partially reflected back to the transducer at interfaces, defects, porosities and at strong differences in acoustic impedance in the sample and the rest of the signal, if not fully reflected continues through the sample.

Technical details:		
Scan System		
	Scan area X axis Y axis Z axis	Big tank 1250 x 1250 mm, small tank 600 x 600 mm 1200 mm , 0.0375 mm step 1600 mm , 0.0375 mm step 300 mm
High frequency Ultrasonic system: HFUS 2000 (Ingenieurbüro dr Hillger)		
	Frequency range Pulse voltage Pulse width Receiver gain Receiver filter	1MHz – 120MHz 180V 6 to 280ns , 3 presets To 110 dB 1,2.25,5,10,15,20,30,50,80 MHz and BB (1-120MHz)
Low frequency Ultrasonic system: Olympus 5077PR		
	Frequency range Pulse voltage Pulse width Optional preamplifier Receiver gain	1kHz – 35MHz 100V, 200V, 300V, 400V 10 preset fixed widths in the range 100kHz – 20 MHz Olympus 5670 : 40dB, 50kHz-10MHz -49 to +59 dB
Data acquisition system: National Instruments PCI- 5114		
	Sampling rate Memory buffer Resolution Bandwidth Voltage range	250 MS/s 8Mb 8 bits 125MHz 20 mV to 20V

Room: H 01.13

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