

NON-DESTRUCTIVE TESTING

# METAL INJECTION MOLDING

## RESONANT INSPECTION OF MEDICAL COMPONENTS

### PROBLEM

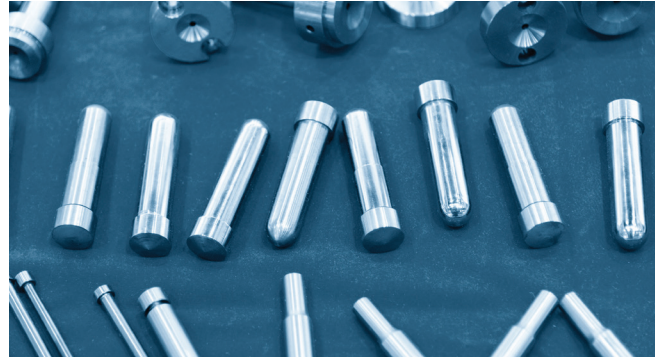
Assuring the structural integrity of complex Metal Injection Molded (MIM) parts is a critical step in quality management systems, especially in medical device applications. Cracks, missing features and other structural flaws can be difficult or impossible to detect via visual inspection, especially at high volumes. Traditional scanning methods of non-destructive testing can be cost prohibitive.

### SOLUTION

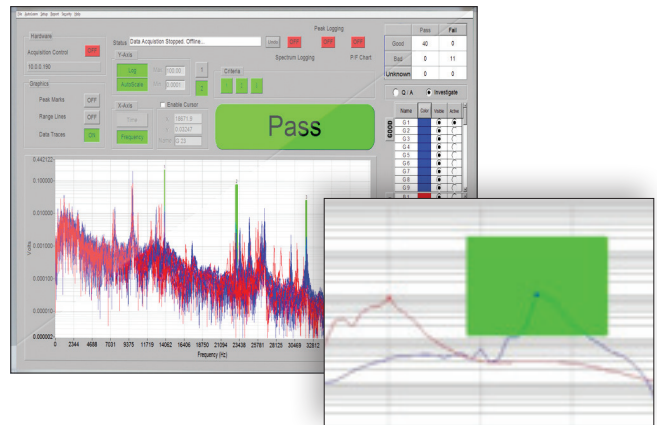
Resonant Acoustic Method NDT (NDT-RAM) provides an extremely fast, whole-body indication of structural integrity on 100% of parts produced. Resonant frequency shifts caused by flaws such as cracks, missing features or missed operations are readily detected. In addition, the system acts as a process monitor – if the resonant frequencies change beyond the norm, the manufacturing process can be halted. It then can be investigated, determining root cause sooner, thereby saving time, scrap, and liability.

### BENEFIT

By correlating the resonant frequency shifts to gauging and x-ray results, NDT-RAM can easily, objectively, and reliably detect flawed parts before they reach the customer. Ideally suited for testing small parts, the NDT-DTF (NDT Drop Test Fixture) system allows for inspection of 100% of MIM parts produced. Reduce liability, raise customer satisfaction, increase confidence in zero defect shipments, and protect your reputation with NDT-DTF.



Powder Injection Molding (PIM) medical parts



Resonant frequency shift due to crack in part from 23,062 Hz to 22,812 Hz

FREQUENCY CRITERIA				
	Freq 1	Freq 2	Freq 3	Freq 4
Average Frequency Passed (Hz)	19930	23059	33729	38351
Std Dev Passed (Hz)	67	44	97	67
Average Frequency Failed (Hz)	19740	22855	33097	37945
Std Dev Failed (Hz)	476	355	209	276
Passed - Failed (Hz)	-190	-204	-632	-406

Note the large frequency difference (shown in red) between (passed – failed) for all four frequency criteria