

Fig.14. Goodman diagram modified to show separate contributions.

U.T.S. Point C corresponds to the maximum bending stress (again with no alternating applied stress) that can be applied to peened material without exceeding its U.T.S. This raising is due to a combination of work-hardening (which raises the U.T.S.) and compressive surface residual stress (which subtracts from any constant applied stress). The compressive surface residual stress is equal to B – C and is often measured. Hence, AB corresponds to the work-hardening contribution and BC to the compressive surface residual stress contribution. Corresponding fatigue strength values are shown as F.S. A, F.S. B and F.S. C.

SUMMARY

The whole point of shot peening is to improve service properties of components, especially their fatigue strength. Improvement is achieved by a combination of work-hardening and induced surface compressive residual stress. These two factors are of similar importance.

Work-hardening centers on the role of crystal dislocations. These are line defects that multiply at astronomical rates and travel at the speed of sound during work-hardening. They form massive pile-ups—particularly at grain boundaries. The vast dislocation content of cold-worked material is arrayed as a sub-structure.

Goodman diagrams are a convenient method of indicating the relative contributions of work-hardening and induced surface compressive residual stress to fatigue strength. They are, arguably, as important as the more familiar S-N fatigue curves. ●

Need a Dependable, Low-Maintenance Media Hopper Fill Valve?

ELECTRONICS INC. has the answer. The On | Off Hopper Fill MagnaValve® eliminates media leakage and the maintenance problems associated with air cylinders and mechanical valves. Other benefits include:

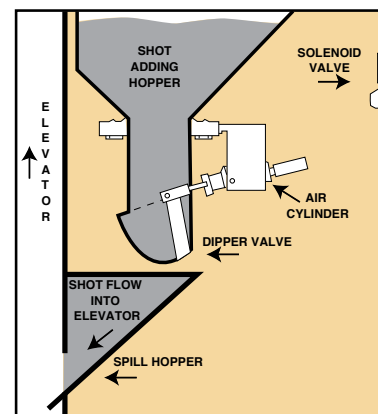
- No moving parts for low-maintenance operation
- Securely holds the media—even in a power failure
- Completely sealed against debris
- Easily retrofitted to older machines
- Provides a dependable and steady media flow
- Works with most ferrous media including cut wire, cast steel shot and grit, and stainless steel cut wire

Why the Media Mix is Important

Media should be replenished at the same rate the spent media is discharged through the dust collector. This will maintain the most consistent process for either peening or abrasive blast cleaning. Additions of large amounts of media over long periods will upset the balance of media in the machine and consistency will be sacrificed. For instance, the addition of several hundred pounds of new media in an abrasive blast cleaning machine will make a significant change in the working mix. Product that is blast cleaned after the addition of media will be treated differently and it may not be acceptable. An On | Off Media Fill MagnaValve provides a dependable flow of media whenever you need it, thereby maintaining a consistent media mix.

Choose the On | Off Hopper Fill Media MagnaValve that best meets your flow range needs.

Flow Range		Model	
lb/min	kg/min	24 Vdc	120 Vac
30	15	178-DC	
140	64	179-DC	179-AC
240	109	180-DC	180-AC
300	136	190-DC	190-AC



The On | Off Hopper Fill MagnaValve® replaces solenoid valves, air cylinders and mechanical dipper valves which are difficult to regulate and are prone to breakdowns.