INTERSTATE-McBEE

CLEVELAND, OHIO, USA

Technical Partsgram - #56

Steel Pistons - Forged vs. Cast

What are the processes?

Forged steel pistons and cast steel pistons appear to look alike but have vast differences in their manufacturing processes which affect their durability and performance.

Forged

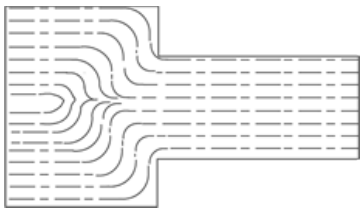
The application of thermal and mechanical energy delivered with a hammer or a die to steel billets or ingots to cause the material to change shape while in a solid state.

Cast

Steel is heated until a molten or liquid state. Once reaching this consistency it is poured into a mold or vessel to create a desired shape.

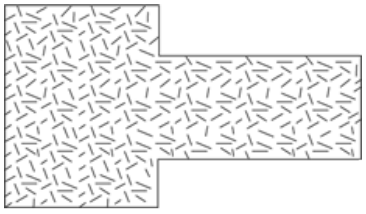
Which is more durable?

Forged steel is generally stronger and more reliable than cast steel and plate steel due to the fact that the grain flows of the steel are altered, conforming to the shape of the part. The forging process causes uniformity of composition and structure resulting in metallurgical recrystalisation and grain refinement as a result of the thermal cycle and deformation process. This strengthens the resulting steel product particularly in terms of impact and shear strength.



Directional strength grain flow

Casting cannot obtain the strengthening effects of hot and cold working due to the single step process of a molten pour. A casting has neither grain flow nor directional strength and the process does not prevent formation of certain metallurgical defects. These defects occur in a variety of forms from impurities being trapped below the surface to vapor bubble and micro fractures.



Little or no grain flow

Interstate-McBee has developed strong relationships with the top manufacturers in the world to produce the forged steel pistons in our product lines. As more engine models are developed using the strength and durability benefits of forged steel pistons our product line will continue to expand.

Please see the table on the right for the numerous engine applications we carry with forged pistons.

Caterpillar®

- 3116
- 3126
- C7
- C9
- C12
- C13
- 3406 B/C
- 3406E
- C15
- 3412
- C18
- C27
- D3500

Cummins®

- ISL
- M11
- ISM
- N14
- ISX
- QSX

Detroit Diesel®

- S60 – 12.7L
- S60 – 14L

Navistar®

- DT530

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