

# SFG

## SHEPHERD FRACTURE GRAIN SIZE STANDARDS

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**METLAB CORPORATION**



### INTRODUCTION

These Fracture Grain Size Standards were developed by B.F. Shepherd for us in conjunction with his paper entitled "The P - F. Characteristic of Steel."\* This work describes a comparatively simple and accurate method of determining differences between various heats of steel of similar chemical analysis. This difference has been found to be a definite property and has been termed the "P - F Characteristic."

By use of the test outlined by Mr. Shepherd, heats of steel can be classified as definite types which have an exact relation to melting practice, ingot yield, hardening sensitivity and physical properties of the hardened part.

The Standards are used for determining or comparing the fracture grain size in steels and the readings obtained are equivalent to the American Society for Testing and Materials austenitic grain size readings.

These Standards have been universally adopted and the number of sets presently in use is more than 1000. They provide a metallurgical implement indispensable to the well equipped laboratory or research department of steel manufacturers and steel users, universities, technical schools, etc.

\* Transactions, American Society for Metals 1934, Vol. 22, Page 979.

# SPECIFICATIONS

The set of standards consists of ten fractured specimens (3/4" diameter) in an enclosed compact wooden walnut case. Each specimen is numbered consecutively from 1 (coarse) to 10 (fine) and are accurately spaced with equal increments of fracture differential through this range. Each specimen is visually compared with our master set of standards from which a section had been metallographically prepared and microscopically examined to verify ASTM grain size as outlined in ASTM Standards, Part 6 E112 - 81.

## PROCEDURE FOR DETERMINATIONS OF GRAIN SIZE

The specimen is compared roughly by removing and replacing individual lids from the standards. The lids are then removed from the three standards which are nearest the unknown fracture. Comparison is made by placing the unknown fracture against the standards and comparing until a reading is obtained. This should be done in bright sunlight for accuracy. The reading should be made to the nearest 1/4 number and recorded as such. For example, 7 1/4 means one step finer than No. 7 standard, 7 3/4 shows the fracture to be one step coarser than No. 8 standard, while 7 1/2 would indicate a fracture grain size exactly intermediate between No. 7 and No. 8 standards.

The reading of the fractures with consistent accuracy requires considerable personal skill and experience. Any fracture determination should be an agreement of two qualified observers. Disagreement by more than 1/2 fracture number after a recheck should result in an arbitration reading by a third observer and the apparent true fracture number recorded.

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It is desirable to keep the fractures fresh and in order to obtain maximum service the following rules should be observed.

1. Keep lids on fractures when not in use.
2. Clean fractures periodically or when required with a soft pencil eraser.
3. **Do not blow on standards - staining could develop.**
4. Storage in a desiccator cabinet is highly recommended.

If replacement standards are required, complete case should be returned for insertion of new standard and other necessary repairs.

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### Ordering information is as follows:

Cat. Ref. SFG - Shepherd Fracture Grain Size Standards, complete set

Overall Dimensions: 12.5" L x 3.5" W x 2" each

Weight: 3 lbs.

