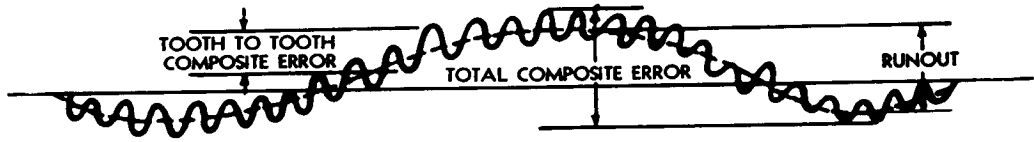


DATE 6/16/58
 SH. 1 OF 1
 COMPILED BY
J A De
 APPROVED ADW

TMC SPECIFICATION NO. S-378

TITLE: PRECISION GEAR DATA

JOB



F.g. 1

A *tooth-to-tooth composite error* is the error which is shown as flicker on the indicator of a variable-center-distance fixture as the gear is rotated from tooth to tooth in intimate contact with the master. The flicker shows the effect of the following errors: Circular-pitch error, tooth-

thickness variation, and profile error. (See Fig. 1.) The *total composite error* is made up of runout, lateral runout and the tooth-to-tooth composite error. In other words, this error is the total center distance displacement read on the indicating device. (See Fig. 1.)

Table 1 Tolerances for Commercial Fine-Pitch Gears

| Class | Total Composite Error, In. | Tooth-to-Tooth Composite Error, In. |
|--------------|----------------------------|-------------------------------------|
| Commercial 1 | 0.006 | 0.002 |
| Commercial 2 | 0.004 | 0.0015 |
| Commercial 3 | 0.002 | 0.001 |
| Commercial 4 | 0.0015 | 0.0007 |

Note: Commercial gears should always be given first preference because they are cheaper to produce. Experience has shown that they are suitable for most fine-pitch applications.

Table 2 Tolerances for Precision Fine-Pitch Gears

| Class | Total Composite Error, In. | Tooth-to-Tooth Composite Error, In. |
|-------------|----------------------------|-------------------------------------|
| Precision 1 | 0.001 | 0.0004 |
| Precision 2 | 0.0005 | 0.0003 |
| Precision 3 | 0.00025* | 0.0002 |

*This possibly would be the result of selection and segregation.

Table 3 Classes and Tolerances

| Class | Commercial | | | Precision | | |
|--|--|---|---|--|---|---|
| | 1 | 2 | 3 & 4 | 1 | 2 | 3 |
| Diameter of Bore | 0.002 | 0.001 | 0.0007 | 0.0005 | 0.0002 | |
| Taper of Bore* | 0.001 per in. of length Max. 0.002 | 0.0007 per in. of length Max. 0.001 | 0.0005 per in. of length Max. 0.0007 | 0.0003 per in. of length Max. 0.0005 | 0.0002 per in. of length Max. 0.0002 | |
| Concavity of Mounting and Registering Surfaces | 0.001 per in. of radius for rigid blanks. 0.0005 per in. of radius for flexible blanks. Total not to exceed 0.003. | | | 0.0005 per in. of radius for rigid blanks. 0.0003 per in. of radius for flexible blanks. Total not to exceed 0.0015. | | |
| Convexity of Mounting and Registering Surfaces | None for any class | | | | | |
| Lateral Runout of Spur and Helical Gears | 0.002 per in. of radius Max. 0.004 | 0.0015 per in. of radius Max. 0.0025 | 0.001 per in. of radius Max. 0.002 | 0.0007 per in. of radius Max. 0.0015 | 0.0005 per in. of radius Max. 0.001 | |
| Lateral Runout of Bevel and Face Gears | 0.001 per in. of radius Max. 0.002 | 0.0008 per in. of radius Max. 0.0016 | 0.0005 per in. of radius Max. 0.001 | 0.0004 per in. of radius Max. 0.0008 | 0.0003 per in. of radius Max. 0.0005 | |
| Nonparallelism | 0.002 per in. of radius Max. 0.004 | 0.0015 per in. of radius Max. 0.0025 | 0.001 per in. of radius Max. 0.002 | 0.0007 per in. of radius Max. 0.0015 | 0.0005 per in. of radius Max. 0.001 | |

*No portion of the taper of the bore must exceed the bore diameter limit.