



TEXTURE MEASUREMENT

1. Scope and Field of Application

1.1 Scope

This objective method covers an instrumental comparison of a sample's texture against a reference by defining measurement conditions and measurement procedures for the measurement of texture.

The aim is to instrumentally determine those texture differences between sample and reference, which are caused by materials, processing, or which arise after testing of, e.g. scratching.

1.2 Field of Application

The application is valid for all textured surfaces of the vehicle interior except fabric and carpet.

Areal topography measurement is preferred to line topography measurement. In case of doubt areal topography characteristics overrule line topography characteristics.

Application of topography gauges (tactile vs. non-tactile):

Measurement approach	Line topography measurement		Areal topography measurement	
Measurement principle	tactile	non-tactile	tactile	non-tactile
Hard trim plastic surfaces	+	+	++	++
Soft surfaces (leather, vinyl, etc.)	-	+	-	++
Tool steel surface (injection mold, etc.)	+	+	++	++

2. Definitions

Terms and definitions in terminology ISO 25178 (areal topography), ISO 4287 and ISO 4288 (line topography) are applicable to this method. Definitions of terms specific to this method are surface characteristics that describe the primary topography and roughness topography.

2.1 Instrument

Master instrument – The Master Instrument is an instrument to establish the basic references among various levels of standards and among other equipments. This instrument is the normal arbiter in any situation not adequately resolved at a lower level and is retained by the organization that issues the masters.

Secondary instrument – A Secondary Instrument is any other instrument used for texture evaluation of the product by reference to the masters.

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2013 12 09	Released	In reference to international standards	



2.2 Masters

Target – A physical design idea representation (intended to be developed).

Internal Approval – A physical representation approved to the target released to go to testing.

Final Approval – A physical representation approved to the internal approval released to master.

Master – A physical representation meant to define design Intent, which is distributed.

Graduated Version – A physical representation meant to define the graduated grain versions according to the master.

Regional Standard – A physical representation of a regional level capability to the master; for distribution within the specific region only (must be coded different to master).

Reference Approval – A visual approval to either a master or regional standard to validate Design Intent and verify feasibility of specific materials.

2.3 Reference

A master or any other physical sample that the measurement of samples is correlated to. If only compared within a sample lot, the one sample is chosen to be reference that is visually closest to the idea/vision of the evaluator.

3. Method & Equipment

3.1 General

The evaluator shall be trained on the instrument to be used by either the manufacturer of the equipment, certified dealers or by Ford personnel.

3.2 Equipment & Maintenance

3.2.1 Equipment Requirements

Measurements shall be made with topography scanning devices that are either based on non-tactile (e.g. optical) measurement (preferred) or based on tactile measurement. The software used for calculation of surface characteristics has to consider ISO 25178 for areal topography and ISO 4287 and ISO 4288 for line topography measurement.

The height resolution should be $\leq 1 \mu\text{m}$; the lateral resolution should be $\leq 10 \mu\text{m}$.

For 2D tactile (contact) devices only:

Profilometers should use a stylus tip of radius $2 \mu\text{m}$ and point angle of 60° (ISO 3274). The measuring range shall be $\geq \pm 300 \mu\text{m}$. In the case that the measuring velocity is adjustable it is recommended to select the lowest in order to increase the accuracy.

For 3D devices only:

Areal topography scanning devices with a fixed measuring areal shall have a minimum size of $10 \text{ mm} \times 8 \text{ mm}$.