



Seat Soft Trim Component Technical Specification (CTS)

1 Introduction

Note: Nothing in this standard supersedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This document establishes the technical specifications for soft trim that shall provide cover to the seat, bolster, head restraint and armrest in the vehicle.

1.2 Applicability. This document is to be used for all Front Seat, Rear Seat, Head Restraint, bolster and Armrest Trim Covers.

1.3 Remarks. The Global Component Technical Specifications (CTS) for Soft Trim describes the performance, requirements and test conditions which the product shall meet. All items which are not sufficiently described shall be documented in cooperation with the GM Seat Engineering and need a written agreement/confirmation on trim drawings, boundary sample, and appearance manual. This applies in particular for deviations from standard requirements.

1.3.1 Key Definitions:

- **Shall.** A binding provision; a must. Deviations are requested by the Design Release Engineer (DRE) and required to be documented in the Appendix C2 of the Engineering Statement of Requirements (eSOR) and approved by the Global Subsystem Leadership Team (GSSLT), Bill of Materials (BOM) Leader and program Chief Engineer.
- **Should.** Denotes preferences when specifying alternatives or desired conformance with objectives, standards, etc. Which if not met must be documented and disclosed by the supplier and approved by the DRE.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

FMVSS 207 FMVSS 213 FMVSS 214

2.2 GM Standards/Specifications.

GMW3010	GMW3405	GMW14145	GMW14729
GMW3059	GMW3600	GMW14231	GMW15058
GMW3116	GMW14122	GMW14358	GMW15651
GMW3220	GMW14124	GMW14364	GMW15862
GMW3221	GMW14125	GMW14365	GMW16331
GMW3232	GMW14129	GMW14444	GMW16440
GMW3262	GMW14136	GMW14573	GMW16509

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2.3 Additional References.

- Appearance Manual SQE Document for seats
- Appendix B: Color and Trim Design Appearance Requirement (CTDAR) of the Engineering Statement of Requirements (eSOR)
- CG1804 Seat Subsystem Technical Specification (SSTS)
- Leather Technical and Appearance Specification, formerly Global Leather Statement of Requirements
- CG4999 Seat Soft Trim VCRI SOR Appendix G3
- Trim Cover Package
- Trim Drawings

Note: The supplier shall be required to create and provide native files for specific documents during the development process

3 Requirements

3.1 System/Subsystem/Component/Part Definition. The seat soft trim component shall provide a cover to the seat cushion and seat back surfaces in such a way that it meets design intent (as defined by GM Studio) while meeting the requirements and craftsmanship herein and in the Seat Subsystem Technical Specification (SSTS) (CG1804). Any deviation needs to be approved by GM and shown on the trim cover drawings. Any deviations that affect appearance must also be identified in the Appearance Manual.

3.1.1 Appearance. All trim covers should exhibit no puckers, tears or gathers in sew. Appearance should conform to all specifications specified in the Seat Appearance Manual.

3.1.2 Content.

3.1.2.1 Physical Content.

3.1.2.1.1 Pattern Cutting Requirements. Individual pattern shape and soft trim material direction shall represent GM styling requirements provided by GM Studio and fit to seat. For optimal utilization, soft trim material width and pattern repeat of the roll goods must be considered.

3.1.2.1.2 Pattern Cutting Tolerances. Cutting tolerances shall be measured before sewing with the pattern centered and in accordance with GMW3221 Code A (Leather) (see Table 1). Any deviations to this tolerance must be agreed to by all parties that provide cutting service for the seat soft trim and the buyer/GM.

Table 1: Pattern Cutting Tolerances ^{Note 1}

	Fabric/Artificial Leather Tolerance	Leather Non- Laminated Tolerance	Leather Laminated Tolerance	Slab Foam
Finished Cut Pattern	± 2.0 mm	± 2.0 mm	± 2.0 mm	± 2.0 mm
Holes	± 1.5 mm	± 1.5 mm	± 1.5 mm	± 1.5 mm

Note 1: See Figure 1 for an example of the cutting tolerance of ± 2.0 mm applied to sample.

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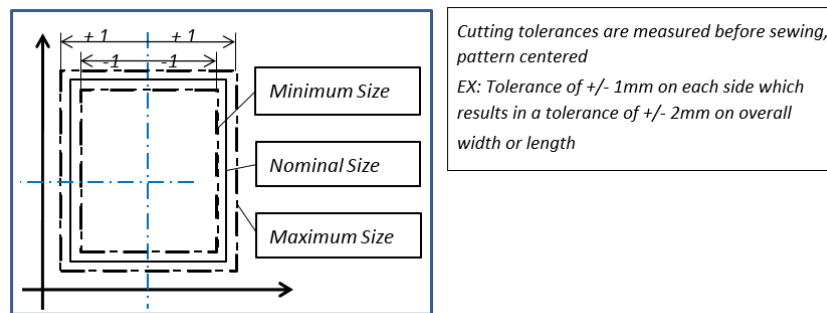


Figure 1: Example of Cutting Tolerance of ± 2.0 mm Applied to Sample

3.1.2.1.3 Sewing Requirements. The seat soft trim component shall be sewn to ensure that the overall fit of the soft trim to other parts of the seat cushion/back surfaces are sewn in such a way that it meets GM design intent Design Styling Outline Requirements (DSOR) found in Appendix B of the Seat Engineering Statement of Requirements (eSOR) while meeting the requirements herein and in Seat Subsystem Technical Specification (SSTS). Deviation of trim cover patterns due to processing (i.e., cutting/sewing) shall be no more than 1% for the sewn trim cover. See 3.1.2.1.4 for Bow and Skew.

3.1.2.1.4 Needle Requirement. Type, thickness and maintenance of the sewing needles shall be selected to optimize seam strength and appearance, in accordance with the materials used (i.e., yarn, fabric, vinyl, leather).

3.1.2.1.5 Sewing Yarn (Thread) Requirement. All sewing yarn (thread) shall meet GMW14129.

3.1.2.1.5.1 Yarn Thickness/Weight. Sewing yarn must fit to the sewing needle thickness (reference Table 2).

Table 2: Yarn Thickness/Weight

Seam Type	Needle (Upper) Thread (Nm)	Bobbin (Lower) Thread (Nm)
Non-Airbag Join Seam	Minimum 40/3 (T90/T105)	Minimum 40/3 (T90/T105)
Decorative Seam	Minimum 20/3 (T90 or T135 – GM Studio driven)	Minimum 40/3 (T90)
Airbag Join Seam (Weakened)	PA, Nm 40/3 (25tex x 3) (T70) (S/C)	PET, Nm 80/3 (12,5tex x 3) (T30) (S/C) With a breaking force of: 2175 cN $\pm$ 325 cN at elongation at break 14% $\pm$ 5% (S/C)

Note: PA = Product Approval; S/C = Safety/Compliance

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3.1.2.1.5.2 Sewing Yarn Color. Reference Table 3.

Table 3: Sewing Yarn Color

Seam Type	Needle (Upper) Thread	Bobbin (Lower) Thread
Join Seam	Color should be harmonious to soft trim material color, unless otherwise specified within Appendix B2/CTDAR of the eSOR	Color should be harmonious to soft trim material color unless otherwise specified within Appendix B2/CTDAR of the eSOR
Join Seam with Piping	Color should be harmonious to piping color unless otherwise specified within Appendix B2/CTDAR of the eSOR	Color should be harmonious to piping color unless otherwise specified within Appendix B2/CTDAR of the eSOR
Join Seam with accent color material or two tone	Color should be harmonious to accent color unless otherwise specified by GM within Appendix B2/CTDAR of the eSOR	Color should be harmonious to accent color unless otherwise specified by GM within Appendix B2/CTDAR of the eSOR
Decorative seam	Color as specified in Appendix B2/CTDAR of the eSOR	Color as specified in Appendix B2/CTDAR of the eSOR
Join Seam to plastic parts	Color should be harmonious to soft trim material color	Color should be harmonious to soft trim material color

Note: CTDAR = Color and Trim Design Appearance Requirement.

3.1.2.1.6 Stitch, Seam and Notch Requirements.

3.1.2.1.6.1 Stitch Requirements. All stitches shall have the following proper thread tension requirements:

- Plaiting position of the top thread and bobbin thread must be in the middle of the seam.
- No loops in the threads are allowed.
- Join seams must comply with GMW14145 and the needle and bobbin threads shall not be visible.
- Decorative seams must comply with GMW14125 and bobbin thread shall not be visible on the A-surface.

3.1.2.1.6.1.1 Stitch Type. Reference Table 4.

Table 4: Stitch Type

Stitch Type	Seam Type
Lock Stitch	Join Seam (Airbag and Non-Airbag) and Decorative Seam (French/Deck)
Chain Stitch	Where lock stitch is not possible (i.e. Multi-stitch lines on a multi-needle machine)
Overcast/Lock Stitch/Chain stitch	To attach parts prior to join seam (i.e. slab foam, listing, labels)

Note: Seams which are exposed to high forces (map pockets, etc.) shall be reinforced where required.

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