GLOBAL DECORATIVE COMPONENT APPROVAL PROCESS

(G-DCAP)

Version 4.0

Authorized:
S.Bazinski/D.Katers/M.Loss/G.Parvulescu/
M.Thomas/M.Waller

Issue: Version 4.0
Effective Date: 27-Jun-2016 Authorized: S.Bazinski/D.Katers/M.Loss/G.Parvulescu/M.Thomas/ M.Waller

DESIGN QUALITY MISSION STATEMENT

Drive vehicle appearance quality and harmony to ensure Design Intent through the optimization of color, texture, gloss and surface quality.

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INTRODUCTION

PURPOSE

This document describes the requirements by which suppliers of all interior, exterior and underhood decorative components must comply in order to achieve appearance approval, as described in the Production Part Approval Process (PPAP) Manual for Ford vehicle programs.

An approved Appearance Approval Report (AAR), obtained from this process, is included in the supplier's Part Submission Warrant (PSW) package. Q-1 suppliers are NOT exempt.

Appearance Harmony includes a range of Ford processes that ensure customer appearance expectations are met or exceeded. This process manual highlights the roles, responsibilities and actions necessary to achieve appearance approval (e.g. Mastering, Fit-to-Nominal, Vehicle Operations Pre-Texture Sign-off, Grain Mapping, and Ok-to-Texture).

This Global Decorative Component Approval Process (G-DCAP) ensures the Design Intent and Appearance Harmony by establishing the Minimum Acceptance Standards to achieve the highest possible quality for maximum Customer Satisfaction.

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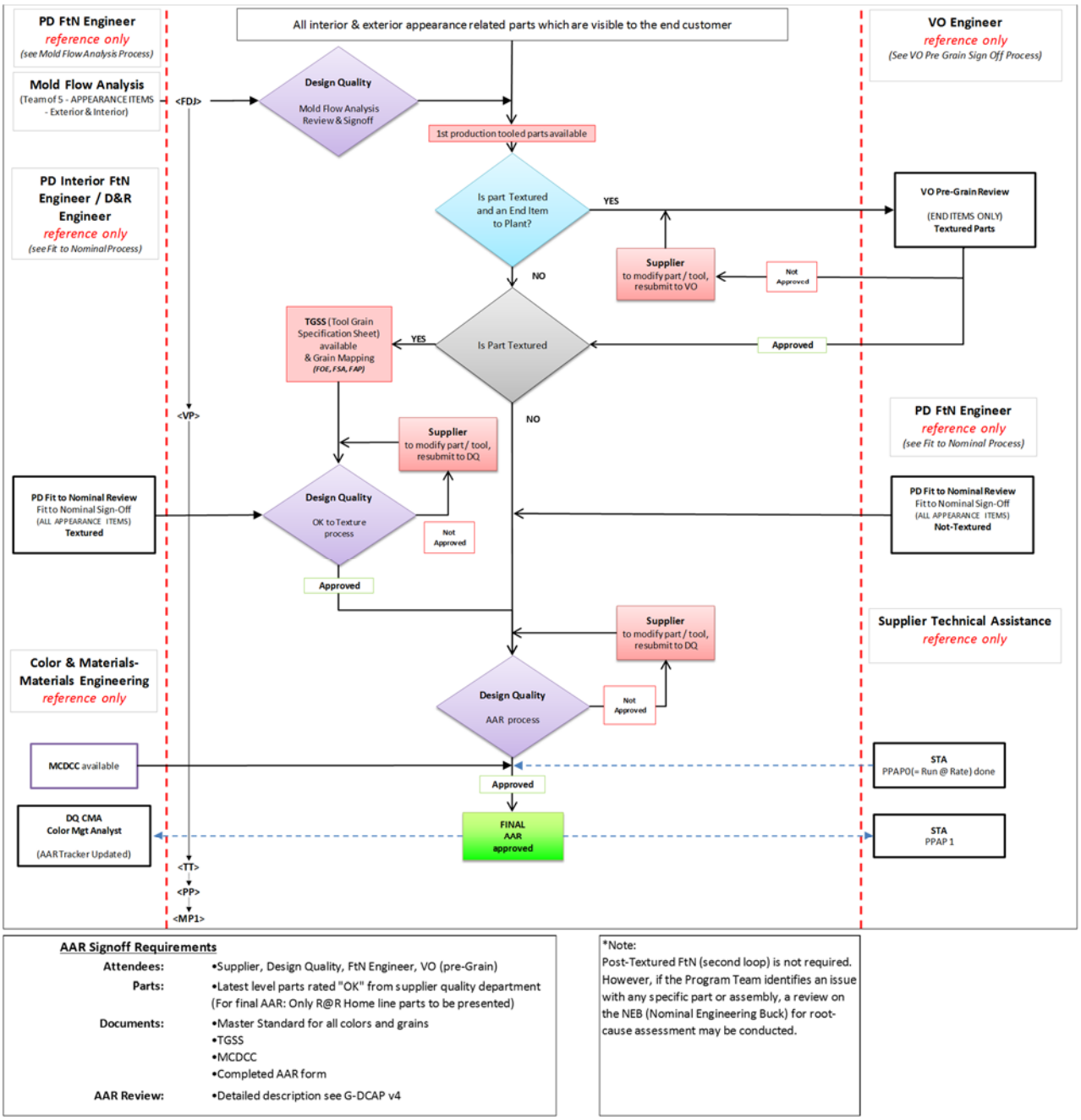
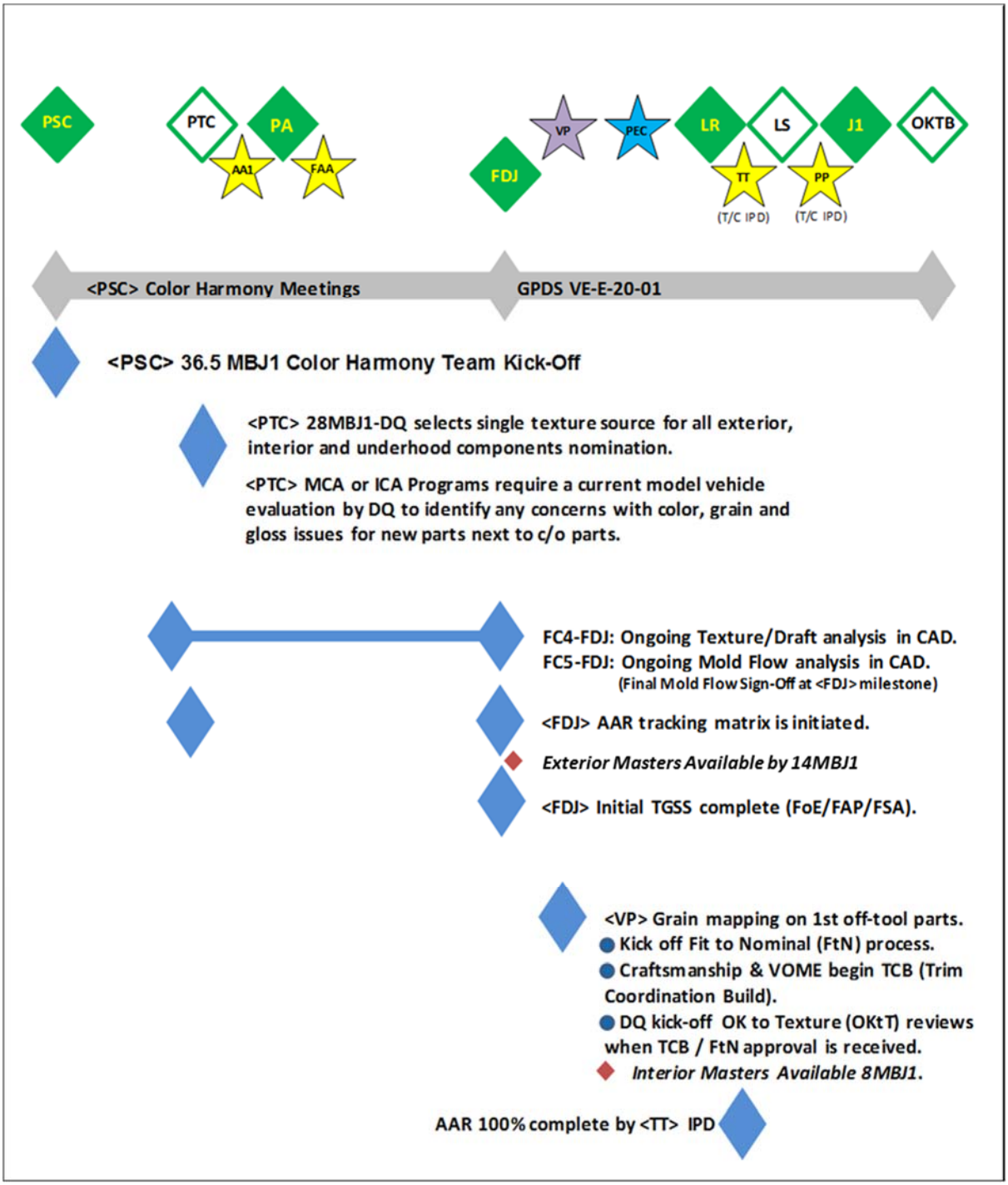
Global Decorative Component Approval Process (G-DCAP) Process Flow Diagram



GPDS PROGRAM APPEARANCE APPROVAL MILESTONES



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CROSS FUNCTIONAL TEAM - ROLES AND RESPONSIBILITIES

DESIGN QUALITY (DQ)

- Supports Color and Material Design (CMD) and Design Studio with lessons learned & feasibility assessments.
- Attends and contributes to the Color Harmony Team.
- Supports development of the Production Direction Letter (PDL) with CMD and Program Management.
- Conducts virtual texture mapping / part and texture mark up with supplier (and D&R for BTPS Parts)- captured on CAD (Tool Grain Specification Sheet-TGSS), and 1st off parts. Supports Tier1 activities with approved graining source and cross-functional team.
- Conducts appearance approval (Ok-to-Texture /AAR) for interior, exterior, underhood components and assemblies, captured on the AAR document.
- Advises Program Management (Color Harmony Team Leader) and Supplier Technical Assistance (STA) of potential Appearance Approval concerns.
- The DQ Color Management Analyst (CMA) establishes the program AAR tracking matrix and delivers progress reports to Program Management through the Color Harmony Team for their presentation to the Launch Management Meetings (LMM) and Stakeholder Meetings.
- Supports part sign-offs for the final Mold Flow Analysis performed by PD CAE. Ford D&R, Tier 1/ Molder, Craftsmanship and the Tool source will also sign-off the Mold Flow Part Analysis.
- Global Programs – It is mandatory that the lead region DQ must communicate and inform other regions of any regionally directed color, grain or gloss differences to meet global design intent. It is also mandatory that the lead region DQ send AAR equivalent part samples to all the other affected regions for globally alignment of color, grain and gloss. (DQ supervisor to reconcile concurrent AAR part approvals on a part by part basis).

COLOR & MATERIAL DESIGN (CMD)

- Establishes the design intent for color, material, texture and gloss,
- Leads the Program Definition Approval event, where the teams reach consensus on color, texture, gloss and finishes for all vehicle lines.
- C&M Mastering (CMM) will sign the color portion of the Material Color / Durability Compliance Certification (MCDCC) for approval to proceed to test (requires 95% color match to master).
- Designers are responsible for providing the Program Teams with a summary of all appearance decisions made.
- Supports DQ in evaluation of Color/Texture approvals ***(FSA)***

TIER1 SUPPLIER and TIER 1 BUILD TO PRINT SUPPLIER (BTPS)

- Manages the timing function of their decorative components (including Tier 2/3 suppliers) for appearance approval submissions. For example: Fit-to-Nominal (FtN), Ok-to-Texture (OKtT), and AAR timing.
- Attends and contributes to the Color Harmony Team.

- Provides parting (split) line locations and Feasibility assessment to Craftsmanship in accordance with surface development criteria prior to tool kick off.
- Provides a list of raw materials, including supplier name, contact information and material specification to the Color Harmony Team Leader – Program Management.
- Provides their STA site engineer with any raw material changes by them or their sub tiers (Tier 2 plus – e.g. Tier 3, 4 etc.). which may require re-AAR approval. An SREA (Supplier Request Engineering Approval) may be required by PD Engineering (D&R) to perform this action. STA must notify DQ if any parts need to be re-evaluated for re-AAR.
- Involves and manages their Tier 2 plus supplier(s), Grainer, Tool maker(s) and Raw Material Supplier(s) (regardless of sourcing direction) - throughout the appearance approval process.
- BTPS - If applicable, provides Tool design, sharing this data with Design Quality Group for review (PRIOR to Tool Kick-Off) for all appearance parts. (Check with the D&R engineer responsible for specific details).
- BTPS - If applicable, supplies CAD Data with Minimum Draft Requirements and components for texture mapping, and supports the nominated texture source throughout the graining process. (Check with the D&R engineer for specific details).
- BTPS - If applicable, Supports the virtual texture mapping activity, and captures this information on the Tool Grain Specification Sheets (TGSS), for all appearance parts, with component sections and draft analysis.
- Supplies all AAR required documents.
- Maintains all AAR forms & parts / assemblies for the active life of part / assembly.
- Upon request, will ship signed-off “AAR Equivalent” parts to other DQ regional representatives for reference on subsequent program launches.
- All Tiered suppliers must use the signed-off AAR part (as a tool) and compare it visually (for color, texture, gloss and quality) during their normal production volumes (freq. determined by STA and the Tier 1/2/3/4 etc.) to ensure ongoing quality compliance is being met.
- Tier1 updates TGSS file (refer to ESOW Design feasibility attachment 06).

TEXTURE SOURCE

- Provides a Single Point of Contact (SPOC), and travels to tool maker and supplier’s production plant when required.
- Ensures the texture is technically feasible.
- Supports DQ and all Tier1 and Tier2/3 suppliers regarding the texture mapping strategy.
- Ensures the texture is applied per the texture mapping strategy, and will be blended across the components.
- Analyzes the draft analysis, the tool draft angles, marks up parts, and photographs them.
- Establishes the virtual texture mapping, and captures all required information on the Tool Grain Specification Sheet (TGSS).
- No texturing activities are allowed without the approved AAR / OK-to-Texture (OKtT) document signed by DQ.
- Supports the Toolmaker and Suppliers with post-grain activities.

PD ENGINEERING / CRAFTSMANSHIP

- PD Engineering establishes the program TCB (Trim Coordination Build) and FtN (Fit to Nominal) tracking matrix.
- Conducts Fit to Nominal review for **all appearance components**.
- Signs off on the appearance part as meeting the required PROD. DEV. (PD) FIT to NOMINAL (on CFG-1002-F AAR form).

VEHICLE OPERATIONS (VO)

- VO provides approval for all end item components requiring grain. VO Pre-Grain Sign-off is required on the AAR form (CFG-1002-F) for all End Item components which require grain.
  - PIA parts within the End Item component does not require VO to sign the Pre-grain portion in the AAR form. This signature block can be left blank.
- The TCB1 event in VOPGOG-227 provides the mechanism for pre-grain approval. This VOPGOG-227 is a global process.
- Design Quality does not own the VO Pre-Grain Sign-off process but we act as the gatekeepers for the VO Pre-Grain signoff.

DESIGN & RELEASE (D&R) ENGINEER

- Coordinates and guides the Tier1 from the development phase to the Production Part Approval Process (PPAP).
- D&R responsible for starting the TGSS process and signing the TGSS form.
  - Please refer to ESOW Design Feasibility attachment 06 for D&R responsibilities to TGSS
- Writes the Alert for unapproved parts, which requires Assembly Plant approval prior to shipping. The Alert is a WERS document used to authorize the shipment of parts temporarily, until the part receives AAR by DQ.
  - Participates and signs off on OK-to-Texture part mark-up reviews.
    - FAP as required
- Responsible for identification / resolution of part and timing issues for appearance items (i.e. incomplete or missing MCDCC, molding issues, etc.) and will report this information to Program Management.

SUPPLIER TECHNICAL ASSISTANCE (STA)

- Conducts Supplier PPAP (Production Part Approval Process) for all Appearance Items.
- Supports Vehicle reviews for MCA and ICA for new and carry over part alignment as required. (See also Section 1.3 vehicle reviews for MCA, ICA, & C/O)
- STA supports OKtT/AAR process & reviews (FAP/FOE)

Program Management

- Leads the Color Harmony Team process.
- Issues the Color and Material Product Direction Letter (PDL) at 18 MBJ1.
    - The C&M PDL will be released through GCMS after July 2016 for all future programs.
    - Any important information (e.g. material specifications) not readily available and outlined in the initial C&M PDL release will be the responsibility of the PDL writer to obtain and update the PDL as soon as possible.
- Presents AAR status provided by DQ as part of program review presentation i.e. OKTB scorecard or specific management review material.
    - Design Quality will support with AAR status and technical information when required.
- Color Harmony Team Leader (Program Management) to complete “Color Harmony / Graining Status” in New Models OK-To-Buy Scorecard.
    - Design Quality will provide support with AAR status and technical information to PM.
- LQOS 310: Plant Color Harmony Review - Color Launch.
    - Any CTG mismatches determined unacceptable by the Design Quality Representative and the assembly plant representatives should be entered into AIMS by the affected VO ME launch representative.

SECTION 1 - APPEARANCE APPROVAL PROCESS

APPEARANCE ITEMS THAT REQUIRE APPROVAL SIGN OFF

- New parts in all colors.
- Carry-over parts in new colors
- Material change*
- Material source change*.
- Capacity Tooling / Tool change*
- Manufacturing location change*
- Or as determined by Ford DQ.

> *__NOTE__: *The approved item will have written in the comment section of the AAR and Label* ***"Reference the original AAR samples for color."***

IN-PLANT PAINTED COMPONENT SURFACE EVALUATION / DOCUMENTATION SIGN-OFF

The following process steps are required for AAR sign-off, on decorative components that are supplied unpainted, for in-plant paint finishing. The steps are designed to ensure that parts represent production-level appearance when reviewed for appearance sign-off.

1. The Tier 1 supplier will notify the appropriate Design Quality Representative and Design & Release Engineer when parts are intended for in-plant paint operation. The Tier 1 supplier is responsible for scheduling the review meeting.

2. The following items should be submitted by the supplier to the Design Quality representative:
   - An unpainted part for review - 1 part from each cavity
   - A part painted in high-gloss black (or DARKEST production color) and high-gloss white, (or LIGHTEST color) - 1 part from each cavity- using the Ford production paint system.
   - If corrective actions are required, suppliers will correct and resubmit painted parts to DQ for final approval.
   - The supplier must retain all documentation per PPAP requirements.
   - Should the component receive a *"Rejected for Surface"* evaluation, the supplier will provide a corrective action work plan and planned resubmission date. Rejected / marked-up parts must be included in the next approval review.
   - FOR COLOR SUBMISSIONS: Refer to Section 4 of the GDCAP manual (Part/System Evaluation Activities)

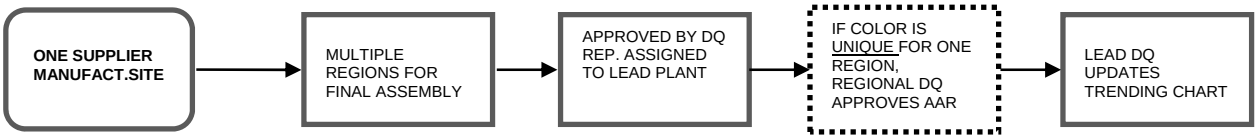
1.1 GLOBAL PART APPEARANCE APPROVAL GUIDELINE

Global Parts: **Multiple Regional** supplier manufacturing sites; same part, new tool and location

- OK to Texture (OKtT) and AAR will be approved by regional DQ representative assigned to the launch site Assembly plant.

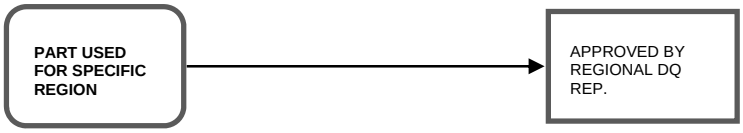
One supplier manufacturing site; parts will be shipped to multiple regions for final assembly

- OK to Texture (OKtT) and AAR will be approved by the DQ representative assigned to the lead Assembly plant.



Unique Parts: Part is unique to vehicle assembly region.

- OK-to-Texture (OKtT) and AAR will be approved by regional DQ representative assigned to the launch site Assembly plant.



Global Color: **Lead Launch Region and Annual Color Change Notification**

- New colors will be approved by lead region per program, and Color Trending data will be entered into the Global Design Quality Color Trending Database.
- Lead Launch Region will sign-off AAR parts, and will send AAR-equivalent parts to share with follow-on regions.

Each respective DQ representative noted above is responsible for updating the color trending chart after initial trending position is defined (located in Global DQ website).

1.2 AAR Component and AAR Sub-System Assembly Reviews

- Program assigned DQ is responsible to ensure assembled AAR sub-systems have equivalent AAR components installed as part of the "system review process".
    - E.g. Supplier A has a component bezel for a headlamp switch which is signed off for AAR. Supplier B brings in a sub-assembly with supplier A's component part (this part must be equivalent to the AAR signed off component) before the DQ can sign-off the sub-system assembly for AAR. It's the responsibility of the DQ person to ensure this process is followed.

1.3 VEHICLE REVIEWS for Mid CYCLE ACTION (MCA) and IN CYCLE ACTION (ICA), NEW and C/O PARTS; C/O PARTS IN GENERAL (Review C/O parts next to new parts regardless of program scale or size)

- Objective – Ensure carry over parts and new (adjacent) parts are aligned for Design Intent – Color, Texture, Gloss and Quality
- DQ will conduct complete current model vehicle reviews at <PTC> for future MCA and ICA programs only. DQ will use the FC5 new surface parts release information from EMM when making this assessment to determine which parts are new. DQ will publish any concerns to the CHT Leader – Program Management for disposition and follow-up.

1.4 PRODUCTION DEVELOPMENT (PD) FIT-TO-NOMINAL (FtN)

- FtN is led by the PD Craftsmanship Engineer
- The FtN event will occur at the Trim Coordination Build TCB1 Event. Ref. to Process VOPGOG-227
    - In some cases, parts may be approved at the TCB0 Event
- Prod. Dev. (PD) Fit to Nominal signature is required on all components and end items (assemblies)
- Parts requiring grain need FtN approval (before DQ grain approval) & ungrained parts require FtN approval before final AAR
- FNA - PD – Interior parts will be signed off by the FtN Engineer
- Electrical Engineering (EESE), Exterior, Lamps, Chassis and Powertrain parts will be signed off by the D&R Engineer. (FNA Only);
- PD Craftsmanship Engineer in FOE/FAP/FSA is responsible for all FtN sign-offs.
- Design Quality does not own the FtN process but acts as the gatekeepers for the PD FtN signoff process.

1.5 OK-TO-TEXTURE (OKtT)

The following procedures are mandatory for the **OK-TO-TEXTURE (APPEARANCE EVALUATION)** /sign-off process:

- PD Engineering Fit-to-Nominal (FtN) is assessed as "Proceed", "Correct & Proceed", "Correct, Proceed & Resubmit.
- VO Pre-Texture Sign-Off is assessed as "OK-to-Proceed" (end items to plant only).
- Grain Mapping is completed. Marked up parts are signed by DQ.
- All TGSS are completed and signed prior to Ok to Texture.

- On submission for OK-to-Texture, the Supplier submits at least one (1) part from each cavity in black or the darkest production color, with a completed AAR form.
- The appropriate DQ representative reviews all parts for design intent, i.e. surface, finish, parting lines, flow lines, gate location, etc. If necessary, the representative will give direction by marking areas on the part requiring improvements.
- Parts will be signed off using the AAR form, and assigned one of the following designations:
  - ***Correct and Proceed***– Supplier corrects all deficiencies noted and proceeds to texture the tool.
  - ***Correct and Resubmit*** – Supplier corrects all deficiencies noted and resubmits parts for approval.
  - ***Approved to Etch/Tool/EDM*** – Supplier should immediately proceed to texture the tool.
- The supplier retains the OK-to-Texture AAR form and returns it with any marked-up pre-textured parts, when submitting for final AAR evaluation/sign-off.
- The Supplier must provide approved documentation as a reference for texture accuracy (i.e. TGSS, marked up parts, photographs, etc.)**.**
- **If the part is not approved to texture (i.e. "Correct and Resubmit"), the supplier will, within five (5) days of review, provide a corrective action work plan and planned resubmission date.**

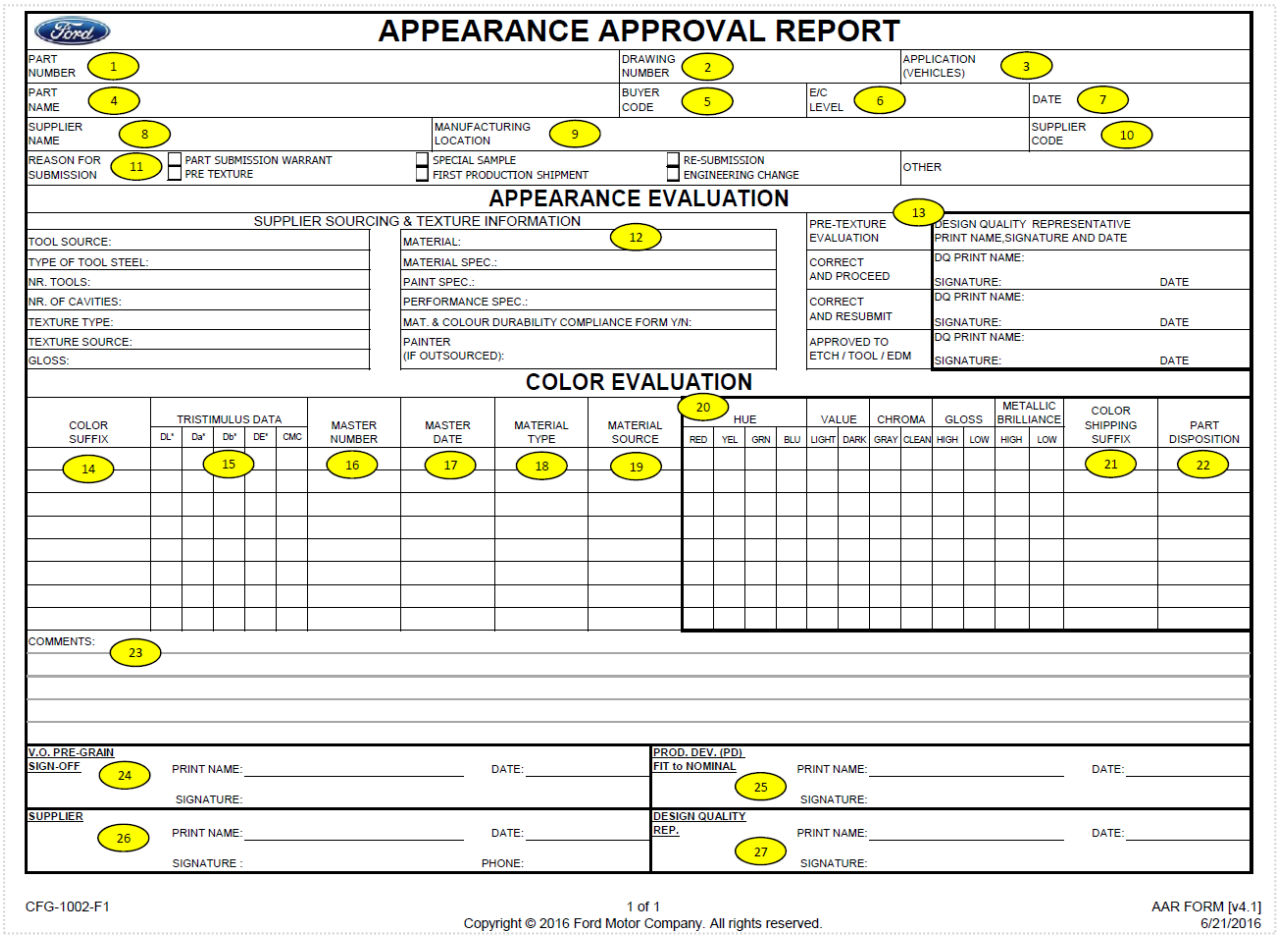
1.6 FINAL APPEARANCE APPROVAL REPORT (AAR)

The following procedures are mandatory for the **FINAL APPEARANCE EVALUATION** /sign-off process:

- The Supplier retains the pre-texture/OK-to-Texture AAR form and returns it with any marked-up pre-textured parts when submitting for post-texture appearance evaluation/sign-off.
- AAR will be given only on Run-at-Rate (R@R) production parts produced at the final production location, using production materials and processes.
- Rejected parts must be included in the next approval review.
- The Supplier must provide an APPROVED Material Color / Durability Compliance Certification (MCDCC) sheet for the final surface materials, as viewed by the customer. This MCDCC must be submitted with a completed AAR.
- Design Quality (DQ) does not own the MCDCC process but we act as the gatekeepers for the Materials Engineering process. (See form in APPENDIX). This is required before DQ signs final AAR.
- The Supplier must provide their masters (texture, color, SM, etc.) for the review.
- The Supplier submits parts for surface, color, texture, and gloss approval from every cavity of new or modified tooling, using the Job #1 intended process from their production tool facilities, in the darkest program color to the appropriate DQ representative.
- DQ approves the additional program colors from a single cavity. This cavity number must be documented on the AAR. Parts are identified and tagged with the Global Ford Minimum Appearance Standard label.
- The approved parts are provided for the appropriate Ford Incoming Receiving area(s) and also for the Tier1 Supplier(s). They are retained by the supplier for their active life, and are made available for review upon request by Ford. Additional approved parts are available upon request for sub-Tier suppliers.
- Lost AAR samples require a new appearance approval and will be brought to the attention of Ford STA.

- The signed AAR form and stickered part, reflecting the **MINIMUM** appearance standard, must be retained by Tier1 supplier; the signed AAR form must be submitted with the PSW to Ford STA.
- Supplier submits a copy of approved AAR to DQ Color Management Analyst (CMA) for update entry into the Global Color Management System (GCMS) AAR Tracker.

1.7.1 AAR Form CFG- 1002-F1



APPEARANCE APPROVAL REPORT

PART NUMBER 1		DRAWING NUMBER 2		APPLICATION (VEHICLES) 3	
PART NAME 4		BUYER CODE 5	E/C LEVEL 6	DATE 7	
SUPPLIER NAME 8		MANUFACTURING LOCATION 9		SUPPLIER CODE 10	
REASON FOR SUBMISSION 11	☐ PART SUBMISSION WARRANT ☐ PRE TEXTURE	☐ SPECIAL SAMPLE ☐ FIRST PRODUCTION SHIPMENT	☐ RE-SUBMISSION ☐ ENGINEERING CHANGE	OTHER	

APPEARANCE EVALUATION

SUPPLIER SOURCING & TEXTURE INFORMATION

TOOL SOURCE:	MATERIAL: 12	PRE-TEXTURE EVALUATION 13	DESIGN QUALITY REPRESENTATIVE PRINT NAME,SIGNATURE AND DATE
TYPE OF TOOL STEEL:	MATERIAL SPEC.:	CORRECT AND PROCEED	DQ PRINT NAME: SIGNATURE: DATE
NR. TOOLS:	PAINT SPEC.:	CORRECT AND RESUBMIT	DQ PRINT NAME: SIGNATURE: DATE
NR. OF CAVITIES:	PERFORMANCE SPEC.:	APPROVED TO ETCH / TOOL / EDM	DQ PRINT NAME: SIGNATURE: DATE
TEXTURE TYPE:	MAT. & COLOUR DURABILITY COMPLIANCE FORM Y/N:		
TEXTURE SOURCE:	PAINTER (IF OUTSOURCED):		
GLOSS:			

COLOR EVALUATION

COLOR SUFFIX 14	TRISTIMULUS DATA DL*	Da*	Db* 15	DE*	CMC	MASTER NUMBER 16	MASTER DATE 17	MATERIAL TYPE 18	MATERIAL SOURCE 19	20 HUE RED	YEL	GRN	BLU	VALUE LIGHT	DARK	CHROMA GRAY	CLEAN	GLOSS HIGH	LOW	METALLIC BRILLIANCE HIGH	LOW	COLOR SHIPPING SUFFIX 21	PART DISPOSITION 22

COMMENTS: 23

V.O. PRE-GRAIN SIGN-OFF 24	PRINT NAME: _____ DATE: _____ SIGNATURE:	PROD. DEV. (PD) FIT to NOMINAL 25 PRINT NAME: _____ DATE: _____ SIGNATURE:
SUPPLIER 26	PRINT NAME: _____ DATE: _____ SIGNATURE : PHONE:	DESIGN QUALITY REP. 27 PRINT NAME: _____ DATE: _____ SIGNATURE:

CFG-1002-F1 1 of 1 AAR FORM [v4.1] 6/21/2016

1.7.2 COMPLETION GUIDELINE FOR OK-TO-TEXTURE AND FINAL APPEARANCE APPROVAL REPORTS (For samples, see Appendix A)

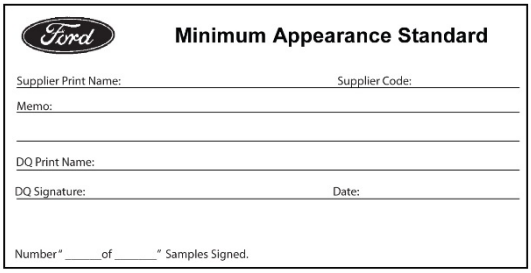
1. **Mandatory, Component Part Number:** Engineering released part number.
2. **Mandatory, Drawing/Assy. Number:** Use the number of the drawing on which the part is shown if different from the part number.
3. **Application:** Enter the model year(s) and vehicle or other program on which the part is used.
4. **Mandatory, Part Name**: Use the finished part name on the part drawing.
5. **Buyer Code:** Enter the code for specific buyer of part
6. **Level:** Engineering Change Level
7. **Date:** E/C date for this submission
8. **Mandatory, Supplier Name:** Supplier responsible for submission (include sub supplier if applicable).
9. **Mandatory, Manufacturing Location:** Location where part was manufactured or assembled.
10. **Mandatory, Supplier Code:** Customer-assigned code for supplier location where the part was manufactured or assembled.
11. **Mandatory, Reason for Submission:** Check box or boxes explaining the reason for this submission.
12. **Mandatory, Supplier Sourcing & Texture Information:** Tool Source, Type of Tool Steel, No. of Tools, No. of Cavities, Texture type, Texture source, Gloss Code, Material, Material Specification, Paint Specification, Performance Specification, Material Color / Durability Compliance Certification Form (MCDCC) Y/N (Yes or No), Painter if painting is outsourced. All related Specifications are available through Ford Materials Engineering.
13. **Mandatory, Pre-Texture Evaluation:** To be completed by Ford Design Quality (DQ) Representative.
14. **Mandatory, Color Suffix:** Use alphanumeric or numeric color identification.
15. **Tri-stimulus Data:** List numerical (colorimeter) data of submission part as compared to the MASTER. (*NOTE: according to FLTM BI 109-02:* optional).
16. **Master Number:** Enter Master Identification Number.
17. **Master Date:** Enter the date on which the Master was approved.
18. **Mandatory, Material Type:** Identify first surface finish and substrate (i.e. paint/ABS).
19. **Mandatory, Material Source:** Identify first surface and substrate suppliers. Example; Basell/Dow.
20. **Mandatory, Color Evaluation, Hue, Value, Chroma, Metallic Brilliance & Gloss:** Visual assessment by Ford DQ, using ISO and Ford Equivalent Terminology. refer to FLTM BI 109-01/2, FLTM BI 110-01
21. **Mandatory, Color Shipping Suffix:** Color part number suffix or color number.
22. **Mandatory, Part Disposition:** To be determined by Ford DQ Representative (approved or rejected).
23. **Comments:** General comments by the supplier or Ford DQ Representative (optional).
24. **Mandatory, Ford V.O. Representative Signature & Date:** Ford approval signature.
25. **Mandatory, Ford PD Engineering (Fit to Nominal) Representative Signature & Date:** Ford approval signature.
26. **Mandatory, Supplier Signature, Phone No. & Date:** Supplier certification that the document information is accurate and meets all requirements specified.
27. **Mandatory, Ford Design Quality Representative Signature & Date:** Ford approval signature.

1.7.3 GLOBAL FORD MINIMUM APPEARANCE STANDARD LABEL

A Minimum Appearance Standard label will be signed and permanently attached to all approved appearance items. The Label should be attached directly to the approved AAR component. If the approved AAR component is too small to attach a label, a permanent alternative method may be used.
(FAP): Consult your DQ Rep/Supervisor for additional clarification regarding local operating procedures for AAR part sign-off.

All appearance items / production parts shipped to the assembly plant must meet or exceed the approved minimum appearance AAR standard component.

The Global Ford Minimum Appearance Standard label is available from your DQ representative.


Minimum Appearance Standard

Supplier Print Name: Supplier Code:

Memo:

DQ Print Name:

DQ Signature: Date:

Number " _____ of _____ " Samples Signed.

1.7.4 COLOR REFERENCE ONLY

Under certain rare circumstances, an appearance item may be used exclusively for color comparison. **These items are not to be used to judge surface quality, orange peel, texture or any other appearance attribute except color**. Such parts are not considered acceptable for AAR or PSW (no sticker will be applied to this part). The appearance part will be marked with indelible media by the DQ representative stating: "***"For Color Reference Only-Resubmit for Final AAR".***

The AAR for this part will NOT be signed by the DQ representative, nor will an appearance sign off sticker be affixed to the part. To avoid confusion, the supplier should retain this Color Reference part, and include it in future appearance reviews, until the part in question has achieved full AAR appearance approval

1.8.1 SUPPLIER PART / RAW MATERIALS

Tiered Suppliers (Tier 1,2,3,4 etc.) suppliers are required to document any part or raw materials changes (via SREA) during normal production where the part does not meet the minimum appearance standard AAR signed off part). The Tiered supplier is required to review these changes with their STA site engineer for appropriate disposition.

MIC Resin Change of Supplier/Source

The following appearance approval process applies to all MIC material resin changes where the colorant remains unchanged and the resin material stays the same (Ford Material Spec & Performance).

- The supplier will be required to submit samples from one tool (all cavities) representing each program color and texture as directed by Ford Design Quality. The Ford Design Quality Rep. is responsible to select which tools shall be reviewed. The Ford Design Quality Rep reserves the right to request any additional tools affected to be brought in for review as necessary.
- A completed MCDCC sheet will also be required.
- Once Ford Design Quality has approved each color and texture the supplier will only need to submit the completed AAR form and the original AAR sample signed prior to the resin change for all remaining resin change submissions. Should the original AAR sample not be available (missing) a new sample with the resin change will be required for sign-off.

Note: Design Quality Representative reserves the right to determine how this will be implemented. If it is not specified by the DQ rep, full re-AAR is required.

1.8.2 SMC PART EVALUATION / DOCUMENTATION / SIGN-OFF

The following process steps should be adhered to for a supplier to achieve AAR sign-off for decorative components made from SMC (Sheet Molded Compound). The steps are designed to be iterative and are applicable to achieving OK-to-Chrome and OK-to-Paint approvals.

1. The SMC supplier will notify the appropriate Design Quality Representative and Design & Release Engineer when parts are available for review. The Tier 1 supplier is responsible for scheduling the review meeting. The following items should be submitted by the supplier to the Design Quality representative:
    - An unpainted part for review-1 part from each cavity
    - A part painted in high-gloss black-1 part from each cavity
2. The supplier will document the review with digital images of marked parts as appropriate/required.
3. If corrective actions are required, suppliers will correct and resubmit their parts to DQ for final approval.
4. The supplier must retain all documentation per PPAP requirements.
5. Should the component receive a “Correct and Resubmit” evaluation, the supplier will provide a resubmission date within five (5) days of review. Rejected parts must be included in the next approval review.
6. FOR COLOR SUBMISSIONS: Refer to Section 3.1 of the DCAP manual (Part/System Evaluation Activities)

Review committee for SMC parts should include:

- Part supplier representative
- Design Quality representative
- Design and Release engineer
- Toolmaker

1.9 SPECIAL COMMODITIES

APPEARANCE BOUNDARY BOOKS

Boundary book development must be led by the appropriate Ford Engineering activity, and executed by the Tier1 Supplier, using the Ford-approved format. Upon completion and approval, the book must be signed by the Tier1, Design Quality, D&R Engineer and Assembly Plant Incoming Quality (with additional signators on a case-by-case basis). With concurrence by DQ, the following special commodities (Leather Wrapped Components, Seats, Wrapped Steering Wheels, Top-Stitched Components) may require an Appearance Boundary Book.

- Tier 1 suppliers, VO Incoming Quality (assembly plant), and sub-tier suppliers (as applicable), will retain copies of the approved Boundary Books.
- Any follow-up changes to the Boundary Book must be submitted to STA for review and acceptance by the original approvers.
- Contact your DQ representative for an example of the approved Boundary Book format.

SEATS: Please consult your regional Seat Engineering and DQ Representative for details.

- **"Master" Seat** – is a physical prototype showing Design Intent; as established by the Ford Design Studio.
- **Seat hard plastics** are reviewed as individual-tooled items for OKtT and Final AAR sign-off by DQ.
- **R@R Seat assemblies** require Final AAR sign-off by DQ.
- **AAR Signed Off seats** must be retained by the Tier 1 supplier for the life of the program.

BADGES/GRAPHICS: All Badges/ Graphics shall be accompanied by a released drawing on a 1 to 1 Mylar or equivalent (Release Drawing, CAD data reference, etc.)

- Approval from the Ford Graphics department is required for verification of Design Intent.
- For Badges, an appropriate Color Master shall be supplied for final submission. (reference normal AAR)

LABELS: The Tier 1 is responsible to ensure that the affixed labels, and their position, have been approved prior to Final AAR sign-off. Design Quality has no jurisdiction on the appearance or contents of labels; Design Quality does not review any labels. Appearance parts with labels must have all the labels affixed in position during final AAR approval/review.

BLACK CERAMIC (Glass):

An appearance sign-off via AAR of the black ceramic execution involves review of the pattern. The 2D print (PPT document) is required for AAR. No MCDCC is required for Ceramic Paint.

LIGHTED COMPONENTS:

DQ will evaluate daytime (unlit condition) appearance criteria only.

The EESE representative will evaluate these components for night-time illumination criteria.

The criteria guideline for the Interior Harmony on Lighted Components IH SDS (Interior Harmony System Design Specification) is available at:

http://www.requirements.ford.com

The following items are approved in the lighted / illuminated state:

- Color (Chromaticity)
- Intensity (Luminance)
- Uniformity / Evenness
- Legibility (Contrast under different ambient lighting conditions)

WHEELS: **Only** one sample is required for appearance approval of multiple cavity/tool cast wheels with a machined surface finish. All subsequent cavities/tools are required to meet the Minimum Appearance Standard established by the approved cavity/ tool.

The "Road Wheel Defect Criteria Guideline" is available from your DQ representative.

UNDERHOOD COMPONENTS: Designated Components follow this G-DCAP manual for appearance approval.

VEHICLE PERSONALIZATION (VP)

FNA

The Ford North America Vehicle Personalization Group offers three (3) levels of decorative components (described below). In all cases, VP Design is responsible for defining appearance intent, surface, and OK-to-Texture. G-DCAP requirements for VP-sourced parts in North America are administered as follows:

1. **PRODUCTION COMPONENTS INSTALLED IN-PLANT** (i.e. Feature vehicle / base program parts; wheels, spoilers, badges, etc.)
   - VP supplies copies of AAR, with OK-to-Texture signatures (must align with approved base program texture source).
   - Supplier provides signed-off parts (when requested)**,** and proof (via MCDCC) of Ford approved materials.

2. **MOD CENTER / OFF-LINE PLANT- INSTALLED** (i.e. Feature vehicles and factory-installed accessories)
   - VP supplies copies of AAR, with OK-to-Texture signatures (must align with approved base program texture source).
   - Supplier provides signed-off parts (when requested)**,** and proof (via MCDCC) of Ford approved materials.
   - VP mod-center components are subject to Base Program DQ review and sign-off for final color approvals and color harmony evaluations at the assembly plant.

3. **DEALER-INSTALLED ACCESSORIES (i.e. VP components that are available only from the dealer)**
   - VP is fully responsible for any VP-designed, dealer-only/dealer-installed component.
   - VP must retain AAR, MCDCC and signed-off part for the life the program, in accordance with G-DCAP guidelines, and make them available to DQ personnel for review if required.

   (**NOTE:** Should the status of a dealer-only part change to Mod Center or Base Program usage, the component will be subject to Design Quality approval for AAR and PPAP certification).

FOE

Ford of Europe G-DCAP requirements for VP-sourced parts are administered as follows:

1. **PRODUCTION COMPONENTS INSTALLED IN-PLANT & MOD CENTER / OFF-LINE PLANT- INSTALLED (i.e. wheels, spoilers, seat covers etc.)**
   - VP performs AAR versus Master Panel (Thierry) or Master Part (signed from VP Design)
   - Supplier provides signed-off parts (when required)**,** and proof (via MCDCC) of Ford approved materials.
   - Base Program DQ will review and approve color harmony (where applicable) at plant level evaluations.
2. **DEALER-INSTALLED ACCESSORIES (i.e. VP components that are available only from the dealer)**
   - VP is fully responsible for any dealer-only product.
   - Should the status of a dealer-only product change to Mod Center or Base Program usage, see point 1.

FAP

Ford Asia Pacific G-DCAP requirements for VP-sourced parts are administered as follows:

- All decorative components must follow the same GDCAP as the Base Program, i.e. FAP Design Quality will be responsible for the review and sign-off of ALL (OK-to-Texture and Final) AAR submissions.
- Note: Proof of the completion of Fit-to-Nominal (FtN) and Material Color Durability Compliance Certification (MCDCC) will be required.
- Supplier Branded Accessory (SBA) does not require AAR.

FSA

Ford South America G-DCAP requirements for VP-sourced parts are administered as follows:

1. **PRODUCTION COMPONENTS INSTALLED IN-PLANT & MOD CENTER / OFF-LINE PLANT- INSTALLED (i.e. wheels, spoilers, seat covers etc.)**
   - All decorative components must follow the same G-DCAP as the Base Program, i.e. FAP Design Quality will be responsible for the review and sign-off of ALL (OK-to-Texture and Final) AAR submissions.
   - Note: Proof of the completion of Fit-to-Nominal (FtN) and Material Color Durability Compliance Certification (MCDCC) will be required.
2. **DEALER-INSTALLED ACCESSORIES (i.e. VP components that are available only from the dealer)**
   - VP is fully responsible for any dealer-only product.
   - Should the status of a dealer-only product change to Mod Center or Base Program usage, see point (1).

SECTION 2 – GLOBAL COLOR MANAGEMENT SYSTEM (GCMS)

PDL, Mastering, e-AAR Form, Texture Tracking, Metrics, Color System Scorecards, Etc.

- GCMS is an all-inclusive system to globally manage color harmony from start to finish using a variety of modules as outlined above.
- GCMS is entirely electronic and replaces most of the paperwork currently done for AAR part approvals and tracking.
- GCMS is being rolled out slowly in 2016 CY and will be fully operational by 2017 CY.
- GCMS Link - https://www.gcms.ford.com/GCMSUiWeb/authenticatePre.do
    - Suppliers need to access GCMS through Covisint
- For an overview and training please contact your regional DQ supervisor.

SECTION 3 - TEXTURING GUIDELINES

3.1 ACID ETCHING TEXTURING (GRAINING)

DQ nominates the program texturing source for all interior, exterior, and underhood textures.

Grain Mapping is required to ensure that the nominated graining source, Toolmaker, Tier 1 Supplier, CMD and DQ representative's expectations are aligned.
Grain Mapping is an exercise, initially on CAD surfaces starting at <AA1> to capture component sections and draft angle analysis in line with Ford CAD Method ‘SD041-0123_M’ and guidelines ‘SD041-0124_G’. At <VP>, the grain is mapped on physical parts. This mapping is done in order to understand how the grain will be applied and blended with consideration to actual tool design geometry, radii, parting lines, and grain direction across mating components.
Once grain mapping is completed:

The Tier1 Supplier, Grainer and Toolmaker capture the agreed direction pictorially and graphically on the TGSS document which is signed by the Tier 1 Supplier, Toolmaker and Nominated Graining Source.
The Tier 1 Supplier manages the initial TGSS activities on CAD and the nominated graining source manages it subsequently on physical parts.

The following guidelines should be accomplished to ensure best quality results:

- All texturing and hand engraving (except EDM) are done by the nominated graining source.
- The original nominated graining source is used for capacity or replacement tools and refurbishment activities.
- The grain pattern selection and orientation has to be identical for every molding cavity.

Ford Design Quality reserves the right to use additional grain sources other than the nominated grain source for any program at their discretion.

3.2 ELECTRICAL DISCHARGE MACHINING (EDM) TEXTURING; SPARK EROSION

DQ will not specify any "EDM" source for texturing. Suppliers interested in using this process for texturing (Stipple patterns only) are required to adhere to the following AAR process guidelines:

- The Engineering Release Drawing accompanies EDM submission.
- Design Quality approves all final burn electrodes.

3.3 CASTING TEXTURES (INCLUDING SLUSH MOLDING) PROCESS

The following process shows the stages of surface approval for all parts to be cast with a texture:

- Vinyl 'Roll Stock' or alternative textured form – approved by CMD Prior to Model wrapping.
- Die Model/PU hard model – approval by CMD/Studio Designer with assistance of DQ.
- Wrapped Model – approval by the DQ representative with assistance of CMD/ Studio Designer.
- Master Mandrel/Cast part – Final appearance approval sign-off by DQ (see post-grain appearance evaluation)

3.4 TOOL/TEXTURE REPAIR PROCESS

Grain repairs are carried out by the nominated graining source. Design Quality reserves the right to use additional grain sources other than the nominated grain source for any repair.

Surface damage to a tool may require repairs to the texture of that tool and a subsequent surface approval by DQ. If a tool is damaged, hand repair or welding should not take place immediately. Photos are emailed to STA, DQ and the graining source, so assessments can be made. The following two steps occur to receive approval:

- Submission of part showing surface repair before re-texturing (in some cases a digital photo may be acceptable).
- The Tier1 resubmits parts to DQ for surface approval and has to follow the GDCAP process.

SECTION 4 - PART/SYSTEM EVALUATION ACTIVITIES

4.1 APPEARANCE EVALUATION

NOTE: THE VISUAL ASSESSMENT IN ACCORDANCE WITH THIS METHOD WILL ALWAYS OVERRIDE NUMERICAL MEASUREMENT DATA AND IS COMPULSORY FOR ANY TYPE OF APPEARANCE APPROVAL.
The Appearance Evaluation is structured into its methods and the recommended tolerances to be applied.

METHODS
The Ford Laboratory Test Methods (FLTM) cover the scope & field of application, definitions, general & equipment requirements, conditioning & test conditions, measurement procedures, measurement evaluations, reports and literature advised for the best possible compliance with Ford's procedure. In addition, these build the foundation of the recommended tolerances to be applied.

- Visual Appearance Evaluation according to **FLTM BI 109-01**
- Color Measurement of Interiors, according. to **FLTM BI 109-02**
- Gloss Measurement of Paint Panels according to **FLTM BI 110-01**

All FLTM's are available (See DQ or Ford Engineering Representative).
The subjective Visual Appearance Evaluation describes a procedure for visual comparison of a sample's color against a reference under illuminants of different spectral distribution.
All personnel involved in viewing and evaluating color, should pass both a color vision test, vision acuity and discrimination test, and be familiar with the color difference rating scheme according to ISO 3668, (see table below).

Ford Equivalent Terminology	ISO 3668 Rating	*ISO 3668 - Degree of Perception*	Definition of Meaning	AAR Approved	*Supplier Action Required*
OK	0	*No perceptible*	not detected/detectable	*Yes*	*None*
Slight	1	*Very slightly, i.e. just perceptible*	detected by experts only	*Yes*	*None*
Maximum	2	*Slight, but clearly perceptible*	detected by the most critical customer	*Yes*	*A color should be adjusted for the next build or next batch during normal production process*
Too	3	*Moderate*	detected by many customers	*No*	*Adjust immediately*

Table: Color difference rating scheme

A **light booth** that meets the requirements is the **GretagMacbeth SpectraLight III (or latest model, also Master Equipment).**
The sample and reference are assessed at face, flash, flop angle and all intermediate positions at daylight illumination D65. In addition, assessment in the later post assembly position is recommended. Material metamerism in the sample

is assessed for the face angle by alternating the illuminant between the different illuminating units (D65, A, F11). Any observed color difference shall be analyzed by the components according to ISO 3668.

In cases where an approval is not granted, it is recommended, though not necessary, to measure the color difference(s) and/or the gloss difference(s).

The objective Color Measurement describes an instrumental comparison of a sample's color against a reference by defining measurement conditions and measurement procedures for the measurement of color of materials.

The evaluator shall be trained on the instrument to be used. **Color spectrophotometers** meeting the requirements are

Instrument	Solid (uni) Colors	Effect Colors
Master	Konica Minolta CM-2500c CT	Byk mac-I
Secondary	Byk Gardner spectro guide	X-Rite MA98, 96, 94

All values shall be calculated for D_{65} illumination and 10° standard observers.

The objective Gloss Measurement of Paint Panels describes three methods for the measurement of the specular gloss of paints with 20°, 60° and 85° geometries. Depending on the gloss value of the 60° geometry measurement the suitable measurement geometry shall be recorded in addition to the 60° geometry value to improve differentiation for paints.

- high-gloss (>70 GU@60° → 20° geometry),
- medium-gloss (10 – 70 GU@60° → 60° geometry) and
- low-gloss (<10 GU@60° → 85° geometry)

The evaluator shall be trained on the instrument to be used. A **reflectometer (gloss meter)** meeting the requirements is

- **Byk Gardner micro-TRI-gloss S** (also Master Instrument).

COLOR CONTROL PROCESS MONITORING

The supplier shall monitor their process to maintain the necessary color position throughout production.

A Quality Control Plan for appearance components must include a visual inspection of Color and Gloss.

Instrument measurements can be included when applicable.

The tolerances that are defined below resemble guidelines for the start of sampling unless otherwise agreed. No rounding of measurements for comparison to these is permitted.

Measured color deviations in comparison to the respective Final Approval shall be differentiated into three categories:

Base Tolerances for the Sampling of Components				
Metamerism Trend Acceptance Guidance				
Customer Satisfaction		Not Acceptable	Borderline	Acceptable
	$\|\Delta E_{00}^*\|$	> 0.75	0.5 – 0.75	< 0.5 SOLID
	$\|\Delta M_{D65/A}^*\|$	> 0.5	0.25 – 0.5	< 0.25
	$\|\Delta M_{D65/F11}^*\|$	> 0.5	0.25 – 0.5	< 0.25

Table: Base tolerances for the sampling of components

Please Note: ***The final AAR approval of a decorative component is subject to visual acceptance in assembled vehicle position.***

The range (difference between the largest and the smallest observation in a data set) of measurements taken on 10 consecutive parts in production shall NOT exceed 0.15 CIELAB units in the a*- or b*-axis.

Refined measurement tolerances for specific colors are based on extensive plausibility tests of measured boundaries for the visual acceptance and feasibility experience. These are determined by FMC Design (Color & Materials), DTO and/or R&A (Vehicle Interior Technologies) and can be updated and logged any time.

COLOR TRENDING

To ensure World Class color harmony, Ford Design Quality will identify a color trending target/color quadrant for all interior and exterior colors. All suppliers will be required to maintain the color trending position for all programs. The latest color trending chart is available from your DQ Representative.

This chart identifies the value (lightness / darkness) and hue trends for all interior and exterior program colors. DQ will only approve submitted components when the color position is within the Ford specified color quadrant.

ORANGE PEEL

To ensure overall vehicle harmony between painted components, for the visual assessment, Orange Peel Standards have been established by Ford DQ.

The Minimum Orange Peel acceptance rating is $\geq$ 7

Those Standards have been approved for usage in evaluating the appearance of painted parts. The set of panels shows a graduated degree of orange peel (flow) from rough to smooth. Each panel within the set is painted black and labelled with a corresponding flow rating (orange peel).

These panels are available from:

- ACT Test Panel Technologies | Headquarters - 273 Industrial Drive Hillsdale, MI 49242

The table on the next page is provided for clarification and assistance in meeting the requirements of this specification.

Panel Nr.	Degree of perception	Meaning	AAR approved	Supplier Action Required
9/10	No perceptible	*not detected/detectable*	*Yes*	*None*
7/8	Very slightly, i.e. just perceptible	*detected by experts only*	*Yes*	*None*
6	Slight, but clearly perceptible	*detected by the most critical customer*	*No*	*Minor adjustment should be made on next lot of material*
5	Moderate	*detected by many customers*	*No*	*Adjust immediately*
4	Considerable	*detected by most customers*	*No*	*Adjust immediately*
≤ 4	Very major	*detected directly by all customers and causes customer dissatisfaction*	*No*	*Adjust immediately*

For additional information, please refer to APPENDIX F – *FORD Visual Orange Peel Standards* Letter

4.2 COLOR HARMONY REVIEWS

Interior and exterior appearance/color harmony reviews are conducted to ensure overall vehicle harmony. Suppliers may be required to adjust their component appearance (post AAR sign-off) at the discretion of DQ based on vehicle harmony reviews.

Normal process adjustments for appearance (constituting minor ratio changes) are allowable to maintain the visual acceptance criteria to the AAR signed off part.

- Any formula/ingredients changes need to be verified with all stakeholders - primarily Materials Engineering. These changes may be required to improve the overall vehicle appearance/color harmony and may need to be verified and approved via SREA. It's the supplier's responsibility to outline these to changes to their STA contact to determine an appropriate action plan.

At the color harmony review (build gateways) – For max calls, Design Quality may require a respray or part resubmission within 72 hours to validate the visual acceptance criteria of the production part.
During the color harmony review, suppliers may be asked to improve the color position of their previously AAR stickered component for improved vehicle color harmony. The supplier will then be required to return the adjusted/ improved component for sign-off/stickering. All previously stickered components, prior to the adjusted date, should be returned to DQ for destruction.

TT Color Harmony Review Requirements:
Suppliers are required to bring their AAR paperwork and signed-off/stickered part to the TT Color Harmony Review (if the component has been AAR approved).
PP, MP1, MP2 Color Harmony Review Requirements:
Suppliers will be required to produce their AAR and signed-off/stickered part to resolve any post TT Color Harmony issues within 24 hours.

Color Harmony reviews are conducted in accordance with the Launch Quality Operating Systems L-QOS 310 which is available from your Design Quality Representative.

4.3 Design Quality Mold Flow Signoff

- Design Quality does not own the mold flow sign-off process.
- Design Quality is an active participant with the team of 6 (DQ, D&R, CAE, Craftsmanship, Supplier and Tool Shop) to sign-off all mold flows (both exterior and interior parts) starting at FC5 and ending at FDJ.
- Issue resolution will occur through the AST, MADF, CADF, Part 2 or Escalation meeting if necessary.
- Hard tools will not be kicked off until DQ has signed off on all mold flows per ESOW & MSOW.

DF7.5.B3	Support and comply with requirements in PPAP. All suppliers, Q1 or non-Q1, must get Design Quality Appearance Approval Report (AAR) sign-off. (Ref. PPAP). • Provide FEA and mold flow analysis to Design Quality prior to tool kick off. Parting line location, gate location, knit lines, sink marks, and positive locating features must be specified in accordance with surface development criteria and approved by DQ prior to tool KO.	SHARED

4.4 Design Quality Auto-Show / Marketing / Special Review Vehicle Evaluation

- Vehicles should be available at least 5 weeks before show or reveal timing.
- Design Quality will audit vehicles for overall color, grain, gloss and quality workmanship.
- Design Quality will identify issues on an excel spreadsheet.
- Design Quality will take pictures of all issues.
- Design Quality will outline the issues identified to the teams managing the corrective actions and make recommendations on how to correct the quality issues identified.
- It's the responsibility of the vehicle teams to decide on how and when to correct the issues DQ has identified

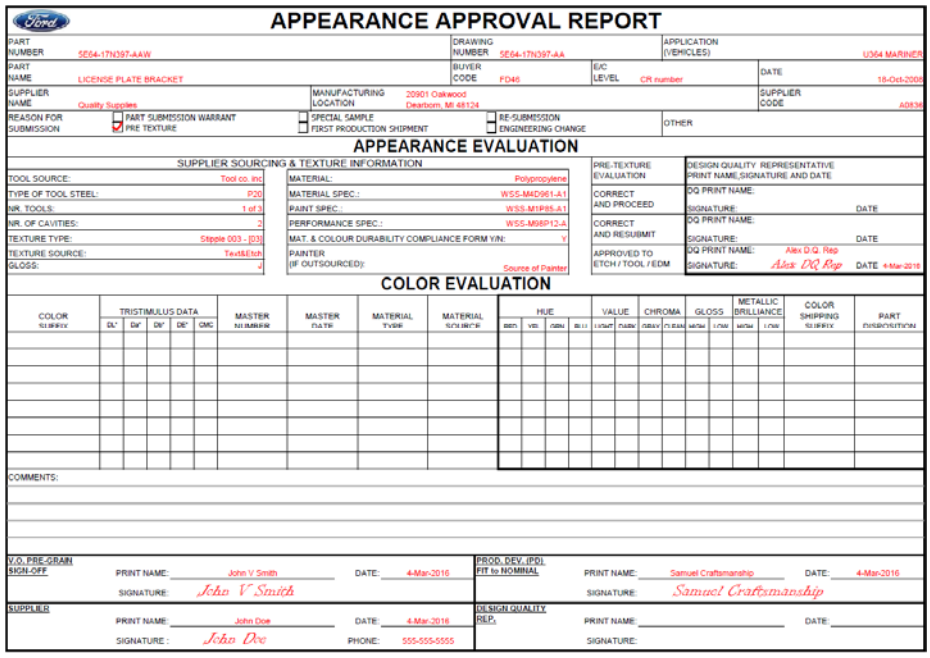
4.5 ***Go Further:*** Ford's Commitment to Appearance Excellence

While the AAR process establishes a Minimum Appearance Standard for all decorative components and assemblies, it is the expectation of the Global Design Quality Group that all Ford Motor Company suppliers strive to exceed the minimum standard. DQ representatives are empowered to review the appearance quality of Ford vehicles post Job #1, and will notify the appropriate plant personnel, should they observe substandard appearance harmony or quality of the decorative components of current product.

Bottom Line: The expectation of continuous excellence does not end with a signed AAR form.

SECTION 5 – APPENDICES

APPENDIX- A:
SAMPLE APPEARANCE APPROVAL REPORTS



APPEARANCE APPROVAL REPORT

PART NUMBER	5E64-17N397-AAW	DRAWING NUMBER	5E64-17N397-AA	APPLICATION (VEHICLES)	U364 MARINER
PART NAME	LICENSE PLATE BRACKET	BUYER CODE	FD46	E/C LEVEL	CR number
DATE	18-Oct-2008	SUPPLIER NAME	Quality Supplies	MANUFACTURING LOCATION	20901 Oakwood Dearborn, MI 48124
SUPPLIER CODE	A0836	REASON FOR SUBMISSION	☐ PART SUBMISSION WARRANT ☑ PRE TEXTURE ☐ SPECIAL SAMPLE ☐ FIRST PRODUCTION SHIPMENT ☐ RE-SUBMISSION ☐ ENGINEERING CHANGE	OTHER	

APPEARANCE EVALUATION

SUPPLIER SOURCING & TEXTURE INFORMATION

TOOL SOURCE:	Tool co. inc	MATERIAL:	Polypropylene	PRE-TEXTURE EVALUATION	DESIGN QUALITY REPRESENTATIVE PRINT NAME,SIGNATURE AND DATE
TYPE OF TOOL STEEL:	P20	MATERIAL SPEC.:	WSS-M4D961-A1	CORRECT AND PROCEED	DQ PRINT NAME:
NR. TOOLS:	1 of 3	PAINT SPEC.:	WSS-M1P85-A1		SIGNATURE: DATE
NR. OF CAVITIES:	2	PERFORMANCE SPEC.:	WSS-M98P12-A	CORRECT AND RESUBMIT	DQ PRINT NAME:
TEXTURE TYPE:	Stipple 003 - [03]	MAT. & COLOUR DURABILITY COMPLIANCE FORM Y/N:	Y		SIGNATURE: DATE
TEXTURE SOURCE:	Text&Etch	PAINTER (IF OUTSOURCED):	Source of Painter	APPROVED TO ETCH / TOOL / EDM	DQ PRINT NAME: Alex D.Q. Rep
GLOSS:	J				SIGNATURE: Alex DQ Rep DATE 4-Mar-2016

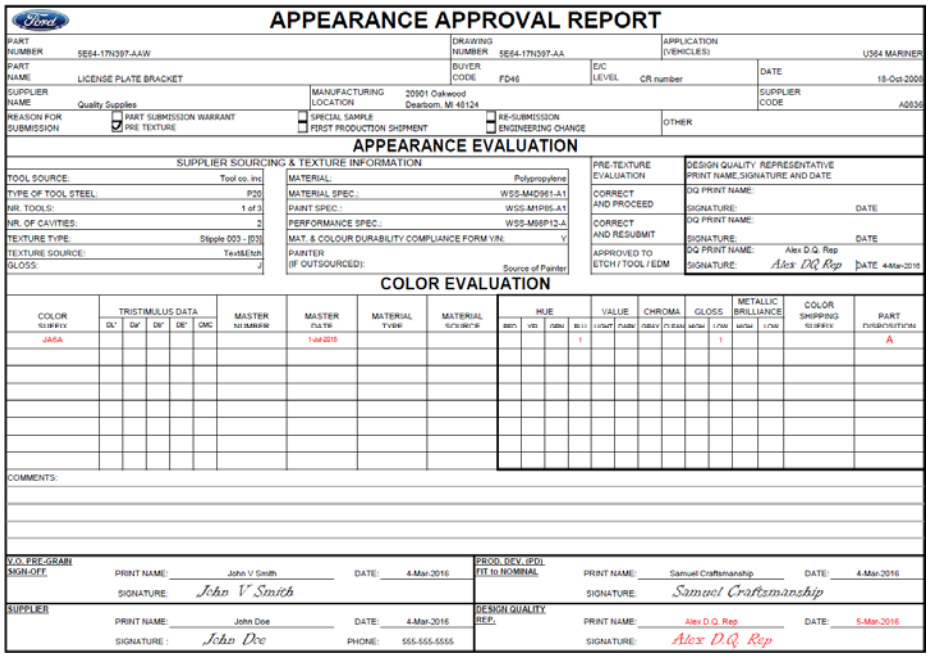
COLOR EVALUATION

COLOR SUFFIX	TRISTIMULUS DATA DL*	Da*	Db*	DE*	CMC	MASTER NUMBER	MASTER DATE	MATERIAL TYPE	MATERIAL SUFFIX	HUE GRN	YEL	GRN	BLU	VALUE LIGHT	DARK	CHROMA GRAY	CLEAN	GLOSS MEDIUM	LOW	METALLIC BRILLIANCE MEDIUM	LOW	COLOR SHIPPING SUFFIX	PART DESCRIPTION

COMMENTS:

V.O. PRE-GRAIN SIGN-OFF	PRINT NAME: John V Smith	DATE: 4-Mar-2016		PROD. DEV. (PD) FIT to NOMINAL	PRINT NAME: Samuel Craftsmanship	DATE: 4-Mar-2016	
	SIGNATURE: John V Smith				SIGNATURE: Samuel Craftsmanship		
SUPPLIER	PRINT NAME: John Doe	DATE: 4-Mar-2016		DESIGN QUALITY REP.	PRINT NAME:	DATE:	
	SIGNATURE: John Doe	PHONE: 555-555-5555			SIGNATURE:		

SAMPLE
OK-to-TEXTURE
APPEARANCE SIGN-OFF



APPEARANCE APPROVAL REPORT

PART NUMBER	5E64-17N397-AAW	DRAWING NUMBER	5E64-17N397-AA	APPLICATION (VEHICLES)	U364 MARINER
PART NAME	LICENSE PLATE BRACKET	BUYER CODE	FD46	E/C LEVEL	CR number
DATE	18-Oct-2008	SUPPLIER NAME	Quality Supplies	MANUFACTURING LOCATION	20901 Oakwood Dearborn, MI 48124
SUPPLIER CODE	A0836	REASON FOR SUBMISSION	☐ PART SUBMISSION WARRANT ☑ PRE TEXTURE ☐ SPECIAL SAMPLE ☐ FIRST PRODUCTION SHIPMENT ☐ RE-SUBMISSION ☐ ENGINEERING CHANGE	OTHER	

APPEARANCE EVALUATION

SUPPLIER SOURCING & TEXTURE INFORMATION

TOOL SOURCE:	Tool co. inc	MATERIAL:	Polypropylene	PRE-TEXTURE EVALUATION	DESIGN QUALITY REPRESENTATIVE PRINT NAME,SIGNATURE AND DATE
TYPE OF TOOL STEEL:	P20	MATERIAL SPEC.:	WSS-M4D961-A1	CORRECT AND PROCEED	DQ PRINT NAME:
NR. TOOLS:	1 of 3	PAINT SPEC.:	WSS-M1P85-A1		SIGNATURE: DATE
NR. OF CAVITIES:	2	PERFORMANCE SPEC.:	WSS-M98P12-A	CORRECT AND RESUBMIT	DQ PRINT NAME:
TEXTURE TYPE:	Stipple 003 - [03]	MAT. & COLOUR DURABILITY COMPLIANCE FORM Y/N:	Y		SIGNATURE: DATE
TEXTURE SOURCE:	Text&Etch	PAINTER (IF OUTSOURCED):	Source of Painter	APPROVED TO ETCH / TOOL / EDM	DQ PRINT NAME: Alex D.Q. Rep
GLOSS:	J				SIGNATURE: Alex DQ Rep DATE 4-Mar-2016

COLOR EVALUATION

COLOR SUFFIX	TRISTIMULUS DATA DL*	Da*	Db*	DE*	CMC	MASTER NUMBER	MASTER DATE	MATERIAL TYPE	MATERIAL SUFFIX	HUE GRN	YEL	GRN	BLU	VALUE LIGHT	DARK	CHROMA GRAY	CLEAN	GLOSS MEDIUM	LOW	METALLIC BRILLIANCE MEDIUM	LOW	COLOR SHIPPING SUFFIX	PART DESCRIPTION
JA6A							1-Jul-2015						1						1				A

COMMENTS:

V.O. PRE-GRAIN SIGN-OFF	PRINT NAME: John V Smith	DATE: 4-Mar-2016		PROD. DEV. (PD) FIT to NOMINAL	PRINT NAME: Samuel Craftsmanship	DATE: 4-Mar-2016	
	SIGNATURE: John V Smith				SIGNATURE: Samuel Craftsmanship		
SUPPLIER	PRINT NAME: John Doe	DATE: 4-Mar-2016		DESIGN QUALITY REP.	PRINT NAME: Alex D.Q. Rep	DATE: 5-Mar-2016	
	SIGNATURE: John Doe	PHONE: 555-555-5555			SIGNATURE: Alex D.Q. Rep		

SAMPLE
FINAL APPEARANCE
SIGN-OFF

APPENDIX- B:
IDENTIFYING COLOR and APPEARANCE CHARACTERISTICS: MATERIAL AND PAINT

Example: Product Material Specification Number – WSS-M4D500-A
MATERIAL SPECIFICATION
The second letter to the right of "M" in the product material number denotes the type of material. Generally, the letters found in this position represent material as follows:

D Hard Plastics
E Panel board
F Leather, Vinyl (soft) supported or unsupported
G Vinyl Bindings, Welts, or Tape
H Cloth, Carpet, Webbing, or Thread
J Paints or Transfers
P Performance Specifications

"ALPHA CODE"
The Color Alpha Code is 7 or 9 digits (ex. 5B8A03J, 5B8AAAATJ) depending on the designated texture code (see table below). This Alpha Code is the Corporate Design Code used to describe the Color, Finish, Texture, and Gloss of all Interior, Exterior, and Underhood Appearance items as per the design intent.

This Color Alpha Code may have seven (7) or nine (9) positions:

1st Position	Indicates first model year introduced (i.e."7" stands for 2007)
2nd Position	Indicates the color family/specific hue (i.e. red, blue, green, yellow, etc.)
3rd Position	Indicates the color lightness (i.e. light, medium light, medium, dark, etc.)
4th Position	Indicates the Finish (i.e. metallic, non –metallic, pearl, etc.)
5th & 6th Position	Indicates Texture code (new system – the 5th, 6th, 7th& 8th position indicates the texture code)
7th Position	Indicates the Gloss if applicable (new system – 9th position indicates the gloss if applicable)

Please note that because some materials such as fabrics do not have a gloss the full alpha code is one digit less / replaced by an asterisk (*) which results in either a 6 or 8 digit alpha code.

Example:
5B8X8D* = Charcoal Black Airfield Fabric
ZHEXAAGP* = Ebony Black Ambassador Fabric

APPENDIX- C:
GLOSS CODE DEFINITIONS

Ford Motor Company's Gloss Code definitions are based on visual assessments.

The following shall serve as a measureable baseline for achieving appearance harmony.
Independent of the color, **the gloss code below defines a range in which the gloss value should be**, when measuring according to Ford Laboratory Test Method (FLTM) BI 110-01 on a **smooth** (e.g. for MIC plastics with SPE – SPI#5 texture), **flat** surface of production material (e.g. plastics, paints, coatings, etc.).
(Due to the inherent properties of a textured surface a gloss reading may or may not directly correlate to the measured range below on the final visual approval.)

For AAR sign-off on component parts (with or without texture) the visual assessment by Design Quality will always override numerical measurement.

Gloss Code	Gloss Units @ 60°	Gloss Units @ 20°
A		**> 92**
B	**76 – 84**	
C	**66 – 74**	
D	**58 – 66**	
E	**47 – 53**	
F	**32 – 38**	
G	**17 – 23**	
H	**7 – 13**	
J	**4 – 6**	
K	**2 – 4**	
N	**1.8 – 2.4**	
R	**1.2 – 2.0**	
L	**< 2.0 (lowest possible)**	
X	**HP (highest possible)**	
Z	**non-applicable**	

Note: Design Quality reserves the right to give specific direction that requires modification to the established gloss level for Color Harmony purposes.

APPENDIX- D:
FORD MASTER PROCUREMENT

Color Material Mastering Process

Contact: Allen Brown
21175 Oakwood Blvd.
Dearborn, MI 48124 USA
abrown76@ford.com
Tel: +1 313-322-4459

Color Masters - Exterior & Interior Paint Standards Only:

Contact: ACT Laboratories, Inc.
273 Industrial Dr.
Hillsdale, MI 49242 USA
http://www.acttestpanels.com/home.aspx
Phone: +1 517-439-1485 Fax: +1 517-439-1652

Color Masters - Vinyl, Plastics, Carpet, Body Cloth, Headliners, other trim/fabric materials Master Textures and Styling Master (SM) Standards:

Contact: Attn: Mastering Dept.
[Please FAX all master requests to +1 313-248-6971]
Master Distribution
21175 Oakwood Blvd.
Dearborn, MI 48123 USA

Ford of Europe (FoE) has an agreement with Thierry to supply Masters.

Contact: Thierry Präzisionslackiertechnik GmbH
Motorstrasse 30
70499 Stuttgart
Germany

Tel.: +49 (0) 711 83 99 74 73
Fax: +49 (0) 711 83 99 74 80

Email: master.samples@thierry-gmbh.de
Web page: www.thierry-gmbh.de

APPENDIX- E:
FORD Visual Orange Peel Standards Letter

Inter Office

Corporate Design

23-Sept-1994

Subject: Visual Orange Peel Standards

The appearance of our products is becoming more critical every day. Standards acceptability regarding appearance quality are necessary to assure the satisfaction of our ultimate customers. Visual Orange Peel Standards have been established by Corporate Quality Design to assist in the evaluation of painted surfaces and their quality of appearance.

The Following are the guidelines of Orange Peel acceptability for supplier provided, painted components:

(7) through (10) on vertical surfaces
(8) through (10) on horizontal surfaces

Ford Motor Company reserves the right and authorizes Corporate Design Quality to give specific direction that deviates from the above guidelines for the purpose of coordination and compatibility.

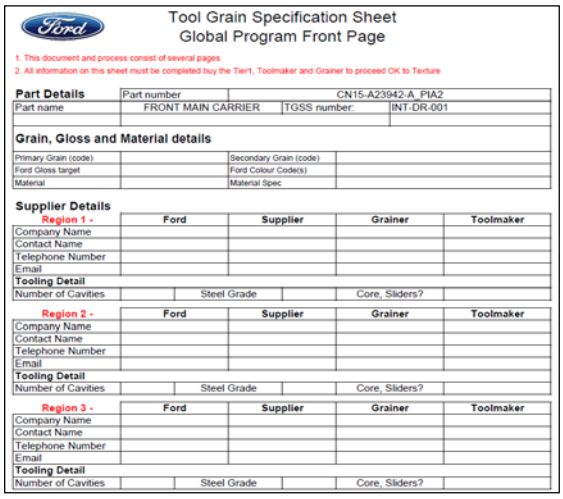
All suppliers of painted exterior components must have a complete set of Ford Motor Company approved Orange Peel Standards.

Orange Peel Standards can be obtained from:

Advanced Coating Technologies, inc.
273 Industrial Drive
P.O. Box 735
Hillsdale, MI 49242-0735
USA
Telephone: +1-517-439-1485

Website:
http://www.acttestpanels.com/product.aspx?productid=5&subcategoryid=7&categoryid=3

APPENDIX- F:
Tool Grain Specification Sheet (TGSS) Example



Tool Grain Specification Sheet
Global Program Front Page

1. This document and process consist of several pages
2. All information on this sheet must be completed buy the Tier1, Toolmaker and Grainer to proceed OK to Texture

Part Details	Part number		CN15-A23942-A_PIA2	
Part name	FRONT MAIN CARRIER	TGSS number:		INT-DR-001

Grain, Gloss and Material details

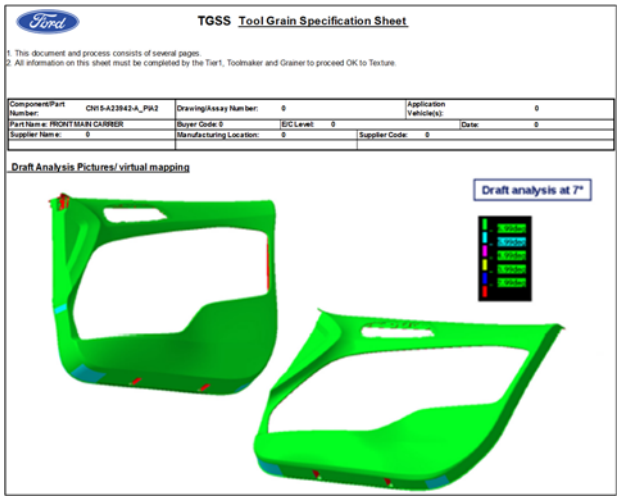
Primary Grain (code)		Secondary Grain (code)	
Ford Gloss target		Ford Colour Code(s)	
Material		Material Spec	

Supplier Details

Region 1 -	Ford	Supplier	Grainer	Toolmaker
Company Name				
Contact Name				
Telephone Number				
Email				
Tooling Detail				
Number of Cavities		Steel Grade	Core, Sliders?	

Region 2 -	Ford	Supplier	Grainer	Toolmaker
Company Name				
Contact Name				
Telephone Number				
Email				
Tooling Detail				
Number of Cavities		Steel Grade	Core, Sliders?	

Region 3 -	Ford	Supplier	Grainer	Toolmaker
Company Name				
Contact Name				
Telephone Number				
Email				
Tooling Detail				
Number of Cavities		Steel Grade	Core, Sliders?	

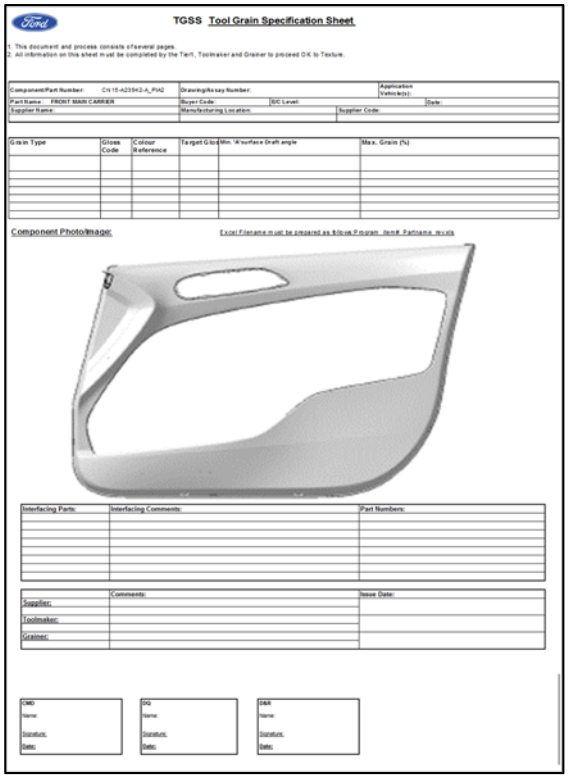


TGSS Tool Grain Specification Sheet

1. This document and process consists of several pages.
2. All information on this sheet must be completed by the Tier1, Toolmaker and Grainer to proceed OK to Texture.

Component/Part Number:	CN15-A23942-A_PIA2	Drawing/Assay Number:	0	Application Vehicle(s):	0
Part Name: FRONT MAIN CARRIER		Buyer Code: 0	E/C Level: 0	Date:	0
Supplier Name: 0		Manufacturing Location: 0		Supplier Code: 0	

Draft Analysis Pictures/ virtual mapping



TGSS Tool Grain Specification Sheet

1. This document and process consists of several pages.
2. All information on this sheet must be completed by the Tier1, Toolmaker and Grainer to proceed OK to Texture.

Component/Part Number:	CN15-A23942-A_PIA2	Drawing/Assay Number:		Application Vehicle(s):	
Part Name: FRONT MAIN CARRIER		Buyer Code:	E/C Level:	Date:	
Supplier Name:		Manufacturing Location:		Supplier Code:	

Grain Type	Gloss Code	Colour Reference	Target Gloss	Min. Draft angle	Max. Grain (%)

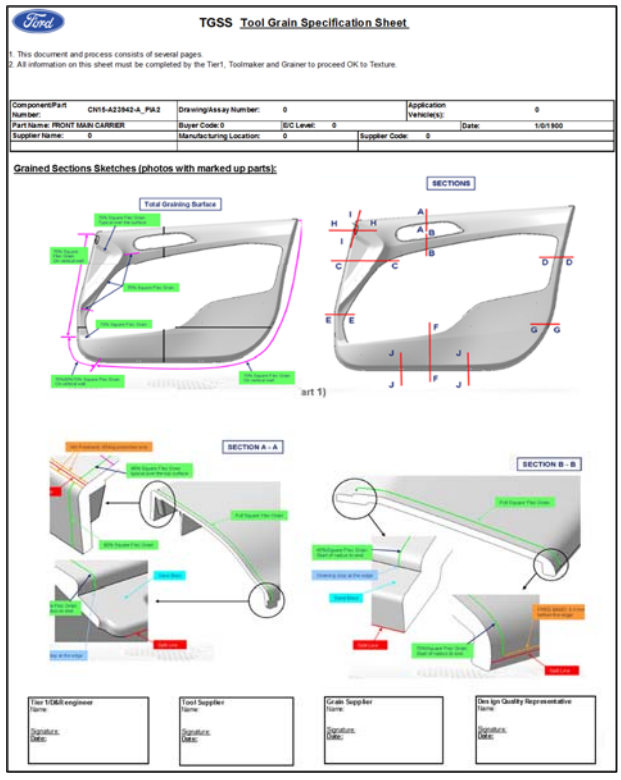
Component Photo/Image:

Excel Filename must be prepared as follows Program_Item#_Partname_rev.xls

Interfacing Parts:	Interfacing Comments:	Part Numbers:

	Comments:	Issue Date:
Supplier:		
Toolmaker:		
Grainer:		

CMD	DQ	D&R
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date:	Date:	Date:



TGSS Tool Grain Specification Sheet

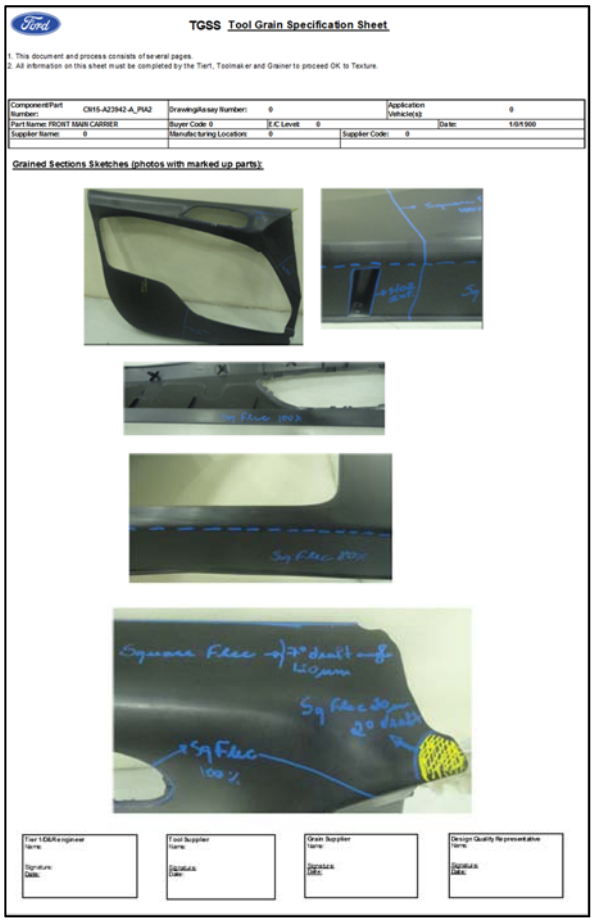
1. This document and process consists of several pages.
2. All information on this sheet must be completed by the Tier1, Toolmaker and Grainer to proceed OK to Texture.

Component/Part Number:	CN15-A23942-A_PIA2	Drawing/Assay Number:	0	Application Vehicle(s):	0
Part Name: FRONT MAIN CARRIER		Buyer Code: 0	E/C Level: 0	Date:	1/0/1900
Supplier Name: 0		Manufacturing Location: 0		Supplier Code: 0	

Grained Sections Sketches (photos with marked up parts):

Tier 1/D&R engineer	Tool Supplier	Grain Supplier	Design Quality Representative
Name:	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Date:	Date:	Date:	Date:

APPENDIX- F: (continued)
Tool Grain Specification Sheet (TGSS) Example



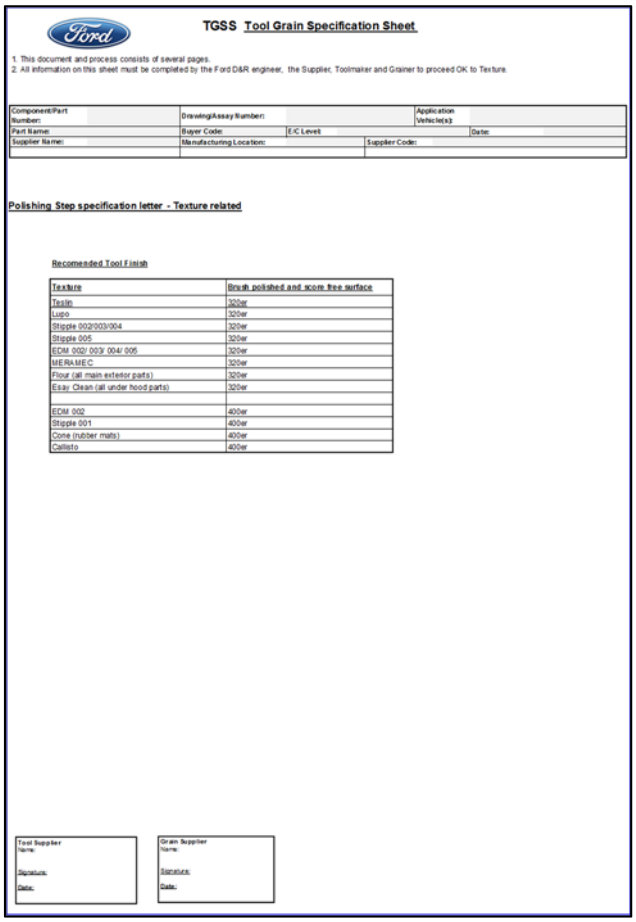
TGSS Tool Grain Specification Sheet

1. This document and process consists of several pages.
2. All information on this sheet must be completed by the Tier1, Toolmaker and Grainer to proceed OK to Texture.

Component/Part Number:	CN15-A23942-A_PA2	Drawing/Assay Number:	0	Application Vehicle(s):	0
Part Name: FRONT MAIN CARRIER		Buyer Code: 0	E/C Level: 0	Date:	1/01/1900
Supplier Name: 0		Manufacturing Location: 0		Supplier Code: 0	

Grained Sections Sketches (photos with marked up parts):

Tier 1/OEM engineer Name: Signature: Date:	Tool Supplier Name: Signature: Date:	Grain Supplier Name: Signature: Date:	Design Quality Representative Name: Signature: Date:



TGSS Tool Grain Specification Sheet

1. This document and process consists of several pages.
2. All information on this sheet must be completed by the Ford D&R engineer, the Supplier, Toolmaker and Grainer to proceed OK to Texture.

Component/Part Number:		Drawing/Assay Number:		Application Vehicle(s):	
Part Name:		Buyer Code:	E/C Level:	Date:	
Supplier Name:		Manufacturing Location:		Supplier Code:	

Polishing Step specification letter - Texture related

Recomended Tool Finish

Texture	Brush polished and score free surface
Teslin	320er
Lupo	320er
Stipple 002/003/004	320er
Stipple 005	320er
EDM 002/ 003/ 004/ 005	320er
MERAMEC	320er
Flour (all main exterior parts)	320er
Esay Clean (all under hood parts)	320er
EDM 002	400er
Stipple 001	400er
Cone (rubber mats)	400er
Callisto	400er

Tool Supplier Name: Signature: Date:	Grain Supplier Name: Signature: Date:

Issue: Version 4.0
Effective Date: 27-Jun-2016 Authorized: S.Bazinski/D.Katers/M.Loss/G.Parvulescu/M.Thomas/ M.Waller

APPENDIX-G:
MATERIAL COLOR/DURABILITY COMPLIANCE CERTIFICATION (MCDCC)

WORLDWIDE MATERIALS ENGINEEING PROCEDURE - MEP 13 (PROPOSED)
https://www.lom.ford.com/launchomatic/launch/view.jsp?chronicleId=0900cad980d635eb&docbase=edmsna1
(Note: Design Quality does not own the MCDCC process but acts as gate keeps to ensure the form is filled out correctly)

MATERIAL COLOR / DURABILITY COMPLIANCE CERTIFICATION (MCDCC)

COLOR & MATERIAL SUPPLIER INFORMATION

MATERIAL SUPPLIER _____ MATERIAL TYPE _____
PRODUCT ID _____ FORD SPECIFICATION _____
IF RESIN, IS IT - ☐ PRE-COLORED ☐ COLOR AT THE PRESS ALPHA CODE / SM / SD _____
COLORANT SUPPLIER _____ COLOR NAME / DESCRIPTION _____
INITIAL PROG. / MODEL YR _____

SUPPLIER REPRESENTATIVE: (Print and Signature) _____ **DATE** _____
I CERTIFY THAT THE ABOVE MATERIAL IS INTENDED TO MEET ALL COLOR/MATERIAL REQUIREMENTS.

FORD COLOR & MATERIALS GROUP DISPOSITION

☐ NON PRODUCTION SAMPLE ☐ PRODUCTION SAMPLE ☐ MASTER ☐ SECONDARY SOURCE ☐ REFERENCE

ENTERED INTO GCMS ☐ YES ☐ NO IF NO, EXCEPTION MUST BE NOTED IN REMARKS.

REMARKS: _____

☐ APPROVED ☐ REJECTED
☐ NO VISUAL MATCH REQUIRED **COLOR MASTERING REPRESENTATIVE** (Print and Signature) _____ **DATE** _____

FORD CORE WHEEL MANAGER SIGNATURE

REQUIRED FOR NEW WHEEL AND WHEEL TRIM COLORS (Print and Signature) _____ **DATE** _____

SUPPLIER TEST DATA AND CERTIFICATION
(complete all fields that apply)

NOTE: ALL COLOR PROPERTY TESTING PER THE APPLICABLE MATERIAL / PERFORMANCE SPECIFICATION MUST BE COMPLETED FOR SIGN-OFF

FOR RESINS, PROVIDE COLOR CONCENTRATE LETDOWN RATIO _____

FOR PAINT OR CHROME, PROVIDE SUBSTRATE MATERIAL SUPPLIER NAME & PRODUCT CODE _____

FORD MATERIAL OR PERFORMANCE SPECIFICATION TESTING WAS PERFORMED TO _____

COLOR PROPERTY DATA, **NOTE PARAGRAPH #'S TESTED** (ATTACH ADDITIONAL PAGES AS NEEDED) :

_____

_____

WEATHERING:
AATCC RATING _____
METHOD USED _____
EXPOSURE LEVEL _____

GRAIN TESTED (AS APPLICABLE):
PROGRAM GRAIN: _____
GRAIN DEPTH: _____

DOES COLORANT CONTAIN HALS?
☐ YES ☐ NO
HALS (Hindered Amine Light Stabilizers) IS PROHIBITED IN PC OR PC/ABS RESINS

SUPPLIER REPRESENTATIVE: (Print and Signature) _____ **DATE** _____
I CERTIFY THAT THE MATERIAL DEFINED ABOVE MEETS ALL COLOR AND SPECIFICATION PROPERTY REQUIREMENTS. (The submission of this data does not preclude part testing)

FORD MATERIALS ENGINEERING DISPOSITION

RESUBMISSION PROMISE DATE: _____

REMARKS: _____

MATERIALS ENGINEERING REPRESENTATIVE (Print and Signature) _____ **DATE** _____

☐ APPROVED ☐ REJECTED
☐ UV DURABILITY NOT REQUIRED **DATE ENTERED IN GCMS** _____

APPENDIX- H:
Master Handling Guidelines

Global Appearance Masters

Storage, Handling and Cleaning Guidelines

Issue: Version 4.0
Effective Date: 27-Jun-2016 Authorized: S.Bazinski/D.Katers/M.Loss/G.Parvulescu/M.Thomas/ M.Waller

Introduction

This guideline offers a set of criteria designed to assist Design Quality Representatives and suppliers in the appropriate handling, cleaning, and storage of appearance masters used in the evaluation and appearance approval process, as described in the Ford Design Quality Global Decorative Component Approval Process (G-DCAP) Manual.

This guideline is effective April 2, 2014 and replaces all previously issued documents on this subject.

BACKGROUND

Appearance harmony is a significant factor in the new vehicle purchase decision. When color, texture, and gloss are accurately and consistently executed, potential buyers perceive added value in that product. To ensure that Ford Motor Company vehicles achieve the highest possible level of appearance harmony, Global Appearance Masters are utilized to assist both the Design Quality Representative and supplier in establishing and maintaining the Minimum Appearance Standard objective for decorative components.

DEFINITION: Global Appearance Masters

Global Appearance Masters ("Masters") are physical visual examples of approved appearance elements, which accurately represent Ford Motor Company Design Intent for Appearance. These masters cover the following appearance elements:

- COLOR - (paint, vinyl, leather, fabric/textile, and mold-in-color plastic) in plaque and master sample form.
- TEXTURE - Derived from both acid-etch and Electrical Discharge (EDM) methods of tool texturing process.
- GLOSS - As shown on painted gloss master plaques, relating to Ford Alpha-code gloss levels.
- FINISH - Non-paint (Plating, In-Mold Film, and Hydrographic) processes, established as Styling Masters (SM).

Usage of accurate masters ensures that all manufactured appearance parts are produced within Ford quality tolerances.
It is important that up-to date, pristine masters are used. This guideline will offer various methods of maintaining the quality of appearance masters over time.

HANDLING

- Handle masters with care to avoid damaging them.
- The wearing of cotton gloves when handling masters should be considered mandatory.
- Ensure that the masters are kept in their respective protective environments when not in use:
  - Polypropylene color/ texture and paint masters should be kept in cloth/paper sleeves
  - Styling masters should be maintained in plastic sleeves or a styling master booklet (fig.1).
- Avoid prolonged exposure to light when in use.
- Avoid stacking unprotected masters on top of each other (scratching).
- When performing outdoor reviews, avoid leaving masters in direct sunlight or high-heat.
- If you suspect or observe degradation of masters; check with Design Quality Core group.

Fig.1 Master standard containment examples

CLEANING

- Clean the masters with microfiber cloth after each review to ensure their longevity.
- Wash master plaques with mild soap, do not rub; Air or blow dry.
- Isopropyl alcohol can also be used to clean oil residue from fingers if gloves aren't utilized during part reviews.
- Avoid damaging the plaque ID label.

STORAGE

- Store all Masters in a cool, dry, dust-free area, away from direct and indirect light.
- Masters should be stored and filed in the drawers in alphabetical order by type (color, grain, gloss, etc.).
- Storage in closed file cabinets is highly recommended (Fig.2).
- Reference parts should be wrapped and stored on shelving to avoid damage and degradation (Fig.3).

Recommended Storage Methods

Fig. 2 Closed filing cabinets for master plaques

Fig. 3 Reference Parts Storage

MASTER DEGRADATION-EXAMPLES:

Factors that contribute to the deterioration of masters and hinder the visual standards set by DQ include:

- Fingerprints/Oils and acids from handling.
- Scratches and scuffing from inappropriate handling.
- Exposure to high temperatures.
- Exposure to continuous lighting sources, particularly direct sunlight.

AUDIT PROCESS FOR MASTERS

- An audit process should be performed Bi-annually by the core process group to ensure that masters are technically accurate, and in pristine condition.
- Monitor master color and gloss regularly to insure its accuracy. We recommend that the gloss and L*, a*, b* values be taken and recorded immediately upon receipt.
- Read your master and compare values to identify any shift in COLOR or GLOSS. If color shifts by more than **.3 units**, the master should be replaced.
- If GLOSS shifts more than **.5 units**, the master should be replaced. Readings for gloss are taken on the smooth low gloss surface with a certified gloss meter @ 60 degrees.
- Periodically, the Design Quality Specialist should visually compare his master to the supplier's to ensure that they are both within the boundary to meet the minimum appearance requirements set for the parts being evaluated.
- When properly handled according to the procedure outlined, master plaques can expect the following shelf-life:

	Exterior Paint Master	Polypropylenes	References	Styling Masters
Years	10 - 15	4 - 7	10 - 15	15 - 20

- Wherever regions boundary is inaccessible, DQ supervisor should audit the masters.
- Suppliers are responsible to ensure that their masters are representative and valid to design intent.
- Suppliers should visually compare their masters bi-annually to confirm that they are valid/pristine through their master provider such as THIERRY, AMERICHEM, ACT etc.

APPENDIX J:
Generic Special Characteristics Communication and Agreement Form (SCCAF) - Alignment Definitions

Consult Ford D&R engineer for SCCAF alignment

Color and Texture Mismatch between AAR Part and Master

Tolerance and Specification

• Production parts must be visually assessed to be between the Minimum Appearance Standard signed off AAR part and the Ford Master Hue Plaque for color / Ford Master Texture Plaque (if the part has texture)

• Production parts must be visually assessed to be in the correct color trend position as defined by Design Quality. (Obtain this information from your Design Quality Representative.

• A visual part assessment will always override any numerical data. Reference - FLTM BI 109-01/2 and (GDCAP) Global Decorative Component Approval Process

Gloss level

Tolerance and Specification

• Production parts must be visually assessed for gloss. The production part must meet the Minimum Appearance Standard signed off AAR part for gloss.

• Consult with your Design Quality Representative to determine your production part gloss range relative to the Minimum Appearance signed off AAR part. Document and add this gloss tolerance range to this SCCAF.

• A visual part assessment will always override any numerical data. Reference - FLTM BI 109-01 / FLTM BI 110-01 and (GDCAP) Global Decorative Component Approval Process

Parting Line Height

Tolerance and Specification

• Production part parting line height (needs to meet the Minimum Appearance Standard signed off AAR part and the Ford F&F 60 micron (0.060mm) maximum requirement.

Note: Design Quality may (at their discretion) scan the Minimum Appearance Standard signed off AAR part to determine an absolute parting line height/flash if necessary. The supplier would then be required to meet this absolute measurement.

Part Quality Issues - Sink Marks (or read thru) / Knit Lines / Gate Blush / Flow Lines / Etc.

Tolerance and Specification

• Production part surface imperfections must be no greater than the Minimum Appearance Standard signed off AAR part.

Mass Lean Culture

Single Point Lesson

CHIPS & SCRATCHES

The goal is to prevent any defect from going to our customer. All employees should follow the simple, yet effective, procedures listed to help in our effort to build the highest quality vehicle we can produce.

C&S is 47% of Paint TGWs

Please report any damage concerns you may have caused, or find, to a plant representative. The representative will identify the concern to make sure it does not get to our customer, by placing the concern in QLS.

QUALITY IS JOB SECURITY!!!

Chip & Scratch PPE

Chip and scratch protection can be purchased from Choctaw-Kaul : Ron Kerrigan (rkerrigan@choctawkaul.com) (734) 417-1194. The alternative is to not wear the items that could potentially damage vehicles.

← Watch Protector

← Belt Protector

← Ring Protector

USE THE CHECKLIST SO THAT WE CAN ELIMINATE

"CHIPS & SCRATCHES"

- NOTHING SHARP IN YOUR POCKETS
- NO KEYS ON YOUR BELT.
- NO CLOTHING THAT MAY SCRATCH OR CHIP THE PAINT: EXPOSED ZIPPERS, RIVETS OR SHARP BUTTONS.
- NO JEWELRY THAT COULD SCRATCH THE PAINTED SURFACE.
- NO LEANING OR WRITING ON VEHICLES.
- LOOSE DIRT AND DUST SHOULD BE REMOVED FROM THE VEHICLE PRIOR TO COLOR HARMONY REVIEW WITH A LINT FREE CLOTH.
- NO SLIDING OF COLOR STANDARDS ALONG THE PAINTED SURFACE.
- TELL SOMEONE WHEN YOU NOTICE OR CAUSE A SCRATCH OR CHIP IN THE PAINT.
- USE A BELT BUCKLE PROTECTOR, WATCH PROTECTOR, AND RING PROTECTOR.
- GEAR SHOULD BE PLACED TO THE REAR.
- PAINT CHIP AND SCRATCH VIDEO SHOULD BE REVIEWED.
  https://team.sp.ford.com/sites/PaintPDL/Launch%20Library/Flawless%20Finish%20Movie1.mpeg

CHIP & SCRATCH IS THE TOP CONTROLLABLE CONCERN IN FORD FACILITY AND YOU CAN HELP ELIMINATE IT.

"THE UNWANTED OPTION"!

GLOSSARY

Alpha Code is the seven or nine character alphanumeric code assigned by CMD to specify color, texture, and gloss of a part.

Appearance (1) of an object, the collected visual aspects of an object or a scene.
(2) perceived, the visual perception of an object, including size, shape, color, texture, gloss, transparency, opacity, etc., separately or integrated. (ASTM E284)

<AA1> Appearance Approval 1

- Interior/Exterior design feasible surfaces approved using full size properties.
- Begin release of production intent surface data.

AAR Appearance Approval Report (CFG-1002-F)

Appearance PSW (Part Submission Warrant)
The overall PSW package, relating to appearance characteristics.

BTPS – Build to Print Supplier
Supplier is responsible to build exactly what is released from the Ford D&R

Corporate Design
The division of Ford Motor Company responsible for complete Class I surface development and delivery (creation to finish) to support production parts.
Color Value – The "lightness/darkness" dimension of the Munsell color system. Examples: Light, Medium, and Dark.
Customer – is the recipient of the organization's or supplier's product or service.

Decorative Component
Is an appearance item or component of an assembly, which is visible to the customer.

Engineering Statement of Work – ESOW
A document that both the Supplier and Ford agreed to.

<FAA> Final Appearance Approval

- Appearance Approval process of all exterior / interior decorative components.
- Design Intent for Appearance (“Design Intent”) established.

<FEC> Final Engineering Completion

- Verification Prototype (VP) issues resolved.
- All DV testing completed.
- Meets FAP03-201 requirements.

<FDJ> Final Data Judgment

- Data readiness for VP tooling/build/test.
- VP build dates are established.

Finish – An appearance aspect of a product material. Examples: Metallic, Tweed Print and Transparent.

Gloss – The referenced reflectivity value of the surface of a product material. Angular selectivity of reflectance, involving surface-reflected light, responsible for the degree to which reflected highlights or images of objects may be seen as super-imposed on a surface.

Global Product Development System (GPDS) - Ford Motor Company's global product development process, which is common to brands. It builds on existing best practices to create a quick, efficient and lean integrated development process.

Global Color Management System (GCMS)

A system which runs the Global Color Harmony Process from start to finish. Modules include Color and Material PDL, Mastering, e-Apperance Approval Report and Color System Review Scorecards.
www.gcms.ford.com

<LR> Launch Readiness

- Cross functional activities confirm readiness to process to Body Constr/Assy Tooling Trial.
- Final approval to proceed to Tooling Trial.
- Manufacturing/Service Joint Venture/Strategic Alliance Complete (if applicable).

Material Color Durability Compliance Certification (MCDCC)

- This form is used to support the Global C&M Process (AAR), which is part of GPDS. This Process will identify the program timing associated with the completion of this form.

  SCOPE

  The Global MCDCC form and procedure will be used for all materials with a color aspect. This includes painted surfaces, moulded-in-color (MIC) plastic surfaces, chromed or anodized surfaces, all soft trim and textiles including leather, vinyl and fabrics, etc. The approval of a new color will require that additional aspects that may affect color durability are verified. The colors will have to be tested on the correct material and surfaces as for vehicle program production intent. The procedure does not affect Component Product Verification (PV) testing that comes later when parts are produced from production tooling and the agreed manufacturing process. Color aspects of parts will continue to be covered in the AAR and signed off by Global Design Quality (Part of the Global Design Technical Operations Group).

Macbeth Light (X-Rite) – A standardized color evaluation lighting system, specified by FLTM BO109-01 to compare production Standards with appearance masters.

"M" Number – A number used to designate the product material used in the production of a part. "M" Numbers are typically shown on the blueprint and are subsequently matched with alpha codes to designate individual colors. Examples: M4D83-A (ABS plastic resin molding compound), M1H315-A (Grenoble Body cloth).

<PA > Program Approval

- Program objectives are approved.
- All supplier CPA's are signed.
- Program funding approval.

Program Direction Letter (PDL) – A document issued by the Programme Office containing specific assumptions and feature information relating to program(s). It is a confidential document that identifies the appearance items with the Design Intent for color, finish, grain and gloss. It is the "official direction" describing programme content and MUST be issued to generate Programme Validation.

<PSC> Program Strategy confirmed

- Program Strategic target/guidelines set.
- Compatibility of ABS with Marketing, Finance, Quality, functional targets, hardware selection and verification timing confirmed.
- Make provisional <PTCC> system decisions (finalized at <PTCC>)

Part Submission Warrant (PSW) – is an industry-standard document required for all newly-tooled or revised products in which the organization confirms that inspections and tests on production parts show conformance to customer requirements.

<PEC> Preliminary Engineering Completion

- All 1st pass Design Verification (DV) testing is completed.
- Meets FAP03-201 requirements.
- Re-DV testing plan is agreed.

Process – is a set of interrelated or interacting activities which transforms inputs into outputs.

Production Part Approval Process (PPAP) – The purpose of production part approval is to determine if all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce a product meeting these requirements during an actual production run at the quoted production rate. The PPAP document contains all forms that are part of the process, including the CFG-1002-F used by DQ for the Appearance and Color PSW evaluation approval of decorative components.

R@R – Run at Rate – Parts produced at R@R meet intended mass production conditions (same tool, machinery, location, etc.).

Suppliers – are providers of production materials, or production or service parts, assemblies, heat treating, welding, painting, plating or other finishing services directly to an organization supplying the OEM or other customers requiring this document.

TGSS – Tool Grain Specification Sheet (see Appendix G)

Texture – the visual or tactile surface characteristics of a tool or part. The visible surface structure depending on the size and organization of small constituent parts of a material; typically, the surface structure of a woven fabric.

VO – Vehicle Operations

<VP> Verification Prototype

- First drivable VP prototype vehicle build is completed & ready for customer delivery.

Warrant – See **Part Submission Warrant**

G-DCAP CHANGE LOG

Change Date	**Author**	**Document**	**Description of Change**
Q1/Q2/A of 2016	D Katers, S Bazinski, M Waller, M Loss, S McConchie	G-DCAP v4	G-DCAP updated to clarify AAR appearance approval conditions as well as additions to prevent multiple stop ship recurrences. All changes/updates have been agreed upon by Global DQ supervisors.