

Technical Design

The TD Toolbox

Dress Form, Fit Model, 3D Digital Avatar

Nov 2020

The Technical Design Toolbox

How do these tools fit?



Technical Design Toolbox Summary

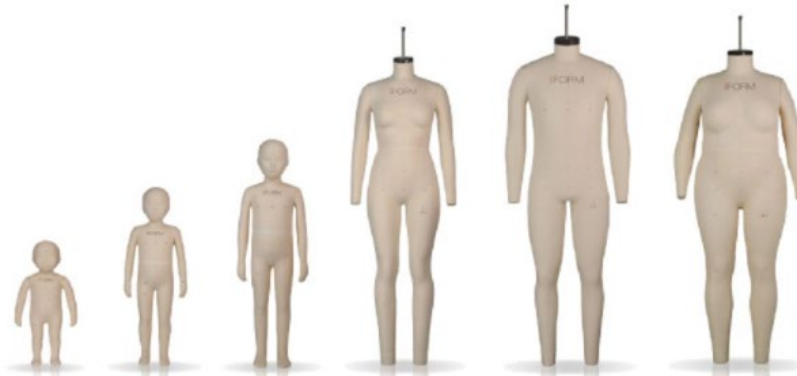
Sample Evaluation	3D Digital Avatar	Physical Sample	
		Dress Form	Live Model
Pattern and Fit Balance	☑	☑	☑
Fit Consistency	☑	☑	☑
Fit Comfort			☑
Fit Corrections	☑	☑	☑
Aesthetic Corrections	☑	☑	☑
Quality & Construction Execution		☑	



Maintaining Consistency Across Tools

Dress Form

- ❑ The dress form is the foundational tool used to fit all of our garments.
- ❑ It enables Technical Design to maintain consistent fit standards, and is used to review garment fit, balance, and pattern shaping.
- ❑ Unlike a fit model, a dress form does not gain or lose weight, and always has the same posture and height. These characteristics help Technical Design to establish fit standards that can be easily duplicated at a vendor location.
- ❑ Provides a consistent tool for KTD's and CTD's to replicate fit and construction issues and help troubleshoot solutions.
- ❑ The dress form is a critical tool which enables CTD's to review and comment on the fit of the garment, enabling speed and CTD empowerment for fit approval.



Model

- ❑ A live model helps to enhance fit by giving the Technical Designer feedback on garment comfort, movement, fabric, and functionality.
- ❑ The fit model can also provide feedback on styling and review of proportion.
- ❑ The fit model moves while wearing the garment. The Technical Designer observes how the garment shifts on the body during wear and notes if the garment returns to natural balanced position or becomes unbalanced after movement.

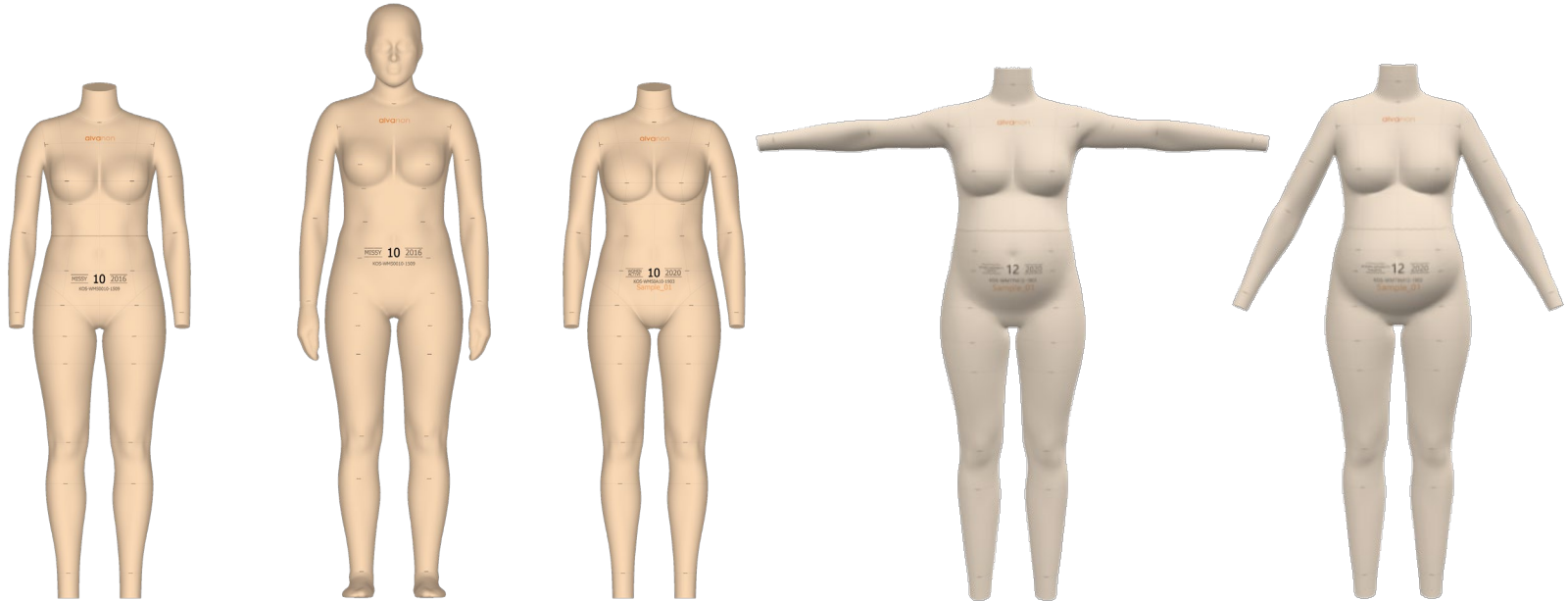
Q: What motions do you think the fit model should make? What movements do you use daily that the model should try?

- Reach forward to check arm lift
- Hug or drive to make sure there is enough room across the back on the garment
- Sit down to check for gapping at back waist or to check skirt or dress length
- Bend over to make sure the chest or back rise isn't exposed
- Mimic walking up stairs or high knees to check the sweep width or rise for comfort during movement



3D Digital Avatar

- ❑ A digital representation the dress form that can be used to evaluate the pattern shape and aesthetic details of a digital representation of a garment.
- ❑ Provides a consistent platform for KTD's and CTD's to replicate fit issues and help troubleshoot the best pattern solution.
- ❑ Unlike a physical dress form, the digital avatar can provide more fitting options; other features such as a head, hands, feet, alternative poses not available on a fixed dress form, or other size & shape options not available in physical dress forms.

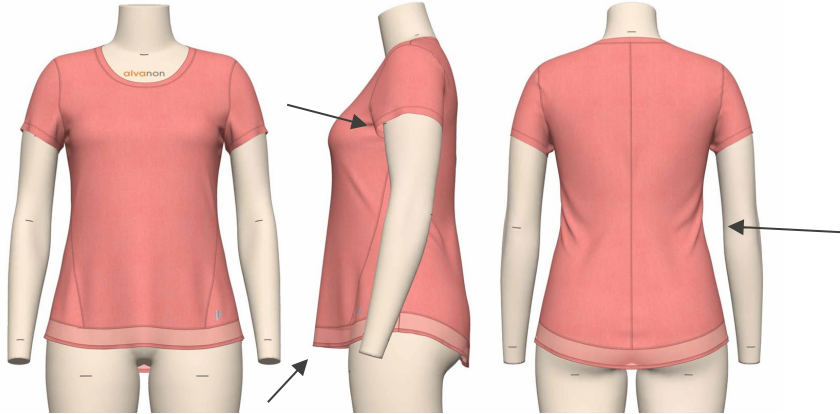


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Aesthetic Corrections			
Quality & Construction Execution			

Pattern and Fit Balance Evaluation

3D Fit : consistent and accurate representation of net pattern shapes and balance without fabric or human distortions



Live Model : additional fit balance problems are revealed as model moves and garment adjusts with movement of body



Dress Form : Analyze pattern adjustment on standardized body after evaluating movement of garment on live model

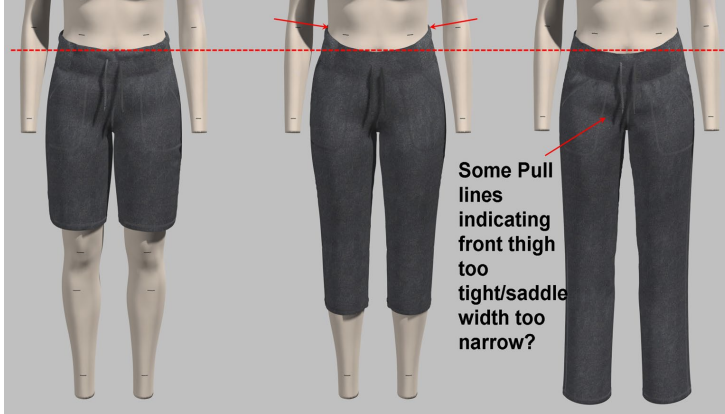


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Fit Consistency Evaluation

3D Fit : consistent and accurate representation of net pattern shapes and block execution across multiple styles



Live Model : feedback on fit consistency of stretch, compression, sheerness, tension, drape of multiple fabrications with body movement



Dress Form : fit execution across fabrications

- Do pattern measurements yield the finished garment measurements we need for a consistent fit?
- Have correct sewing allowances, shrinkage allowances have been built into the pattern?
- Are body landmarks maintained when fabrication drape/stretch properties change?



Spec - HPS 26"
On Body - 26.375"



Spec - HPS 26"
On Body - 27.25"



Spec - HPS 26"
On Body - 27.75"

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Fit Comfort Evaluation

Q: What feedback is needed from the fit model on this knit top? What would you assess on the model in this example?



A:

Does the fabric and fit allow for easy forward reach?

Is the model easily able to put this on over their head?

Are the armholes comfortable and not too tight?

Fit Comfort Evaluation

Q: What feedback is needed from the fit model on this romper? What would you assess on the model in this example?



A:

Is the model easily able to put this on over their hip, arms and shoulders?

Do they have enough trunk and rise length to sit comfortably?

Does the leg opening allow for easy movement walking up and down stairs, while keeping in mind modesty?

Fit Comfort Evaluation

Q: What feedback is needed from the fit model on this hooded one piece? What would you assess on the model in this example?

A:

Do they have enough trunk and rise length to sit comfortably?

Would this garment be comfortable for sitting and sleeping?

How does the fabric feel? Is it soft and cozy?

How are the cuffs/leg openings, are they comfortable and not too tight?

Do the ears, mane, or tail cause any discomfort while moving, sitting, etc?

Is the front opening large enough for the model to put on the garment?



Fit Comfort Evaluation

Q: What feedback is needed from the fit model for this lined dress? What would you assess on the model in this example?



A:

Does the zipper slide easily?

Does the lining have appropriate comfort and ease?

Is there enough across back to allow for forward and upward movement?

Is there easy forward and upward lift?

Are you able to easily walk up stairs and sit comfortably?

Does the HPS foldline move from its original position after the model moves in the garment?

Fit Comfort Evaluation

Q: What feedback is needed from the fit model for this Performance Legging? What would you assess on the model in this example?



A:

Does the waist stretch enough to get over the hip without popping the stitches?

When the model squats, bends, and moves in the garment, does the garment position on the body stay in place at the waist or pull/slide down?

When model squats, or bends, does the fabric become too sheer or see through to the point that it is inappropriate?

Are there any thick bulky seams that hit in uncomfortable position such as over the knee cap that would cause discomfort during certain activities?

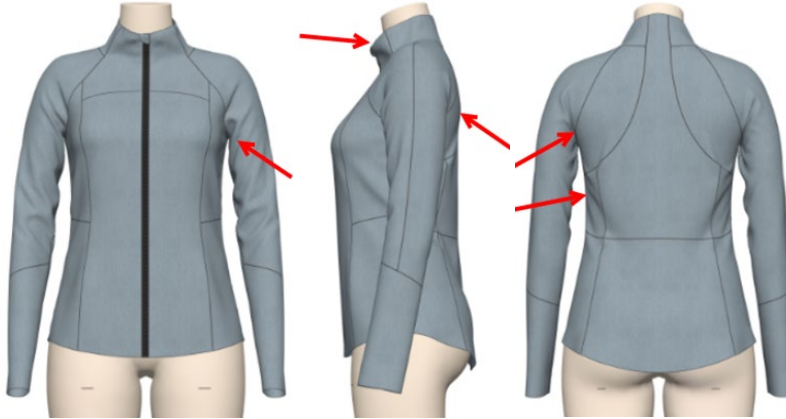
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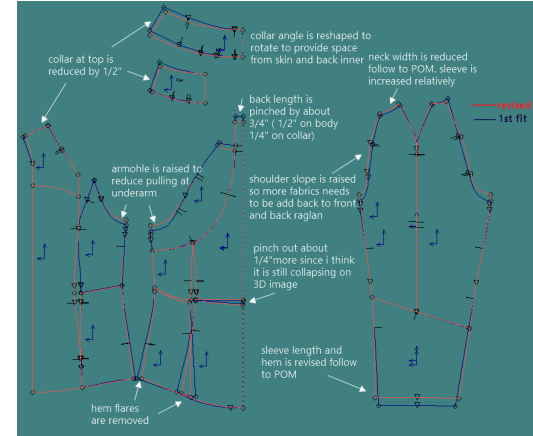
Fit Correction Evaluation

3D Fit : Use comparisons of before/after pattern corrections to confirm best method to adjust pattern and verify fit issues are improved before making physical sample.

3D Counter Sample: Identify fit problems



Analyze Pattern for Possible Corrections



Take the estimate out of pattern corrections. Fit correction options can be tested and seen instantaneously to verify accuracy.

Verify Pattern/Fit Correction against previous sample



Apply Additional Options



Fit Correction Evaluation

- ❑ CTD and KTD team can believe and trust the best pattern shape has been applied for physical sample evaluation.

1st Fit: Verify Movement, Fit Consistency, Comfort, and Overall Execution



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Quality & Construction Execution			

Aesthetic Correction Evaluation

3D Fit : Use comparisons to confirm before/after aesthetic corrections.

Before :



REDUCE RUFFLE
HEIGHT TO 1" @
SIDE SM

NEED TO
ELIMINATE POINTS
AT SIDE SEAM

After :



RUFFLE HEIGHT
REDUCED

POINTS @ SIDE
SEAMS
ELIMINATED

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Construction and Quality Evaluation

Physical Samples: will still be required to confirm overall execution to meet customer's expectation of safety, quality, and durability.

- ✂️ Change in Fabric Weight
- ✂️ Functional and Aesthetic Trim Applications
- ✂️ New Embellishment Methods



How do these considerations also impact accurate costing?



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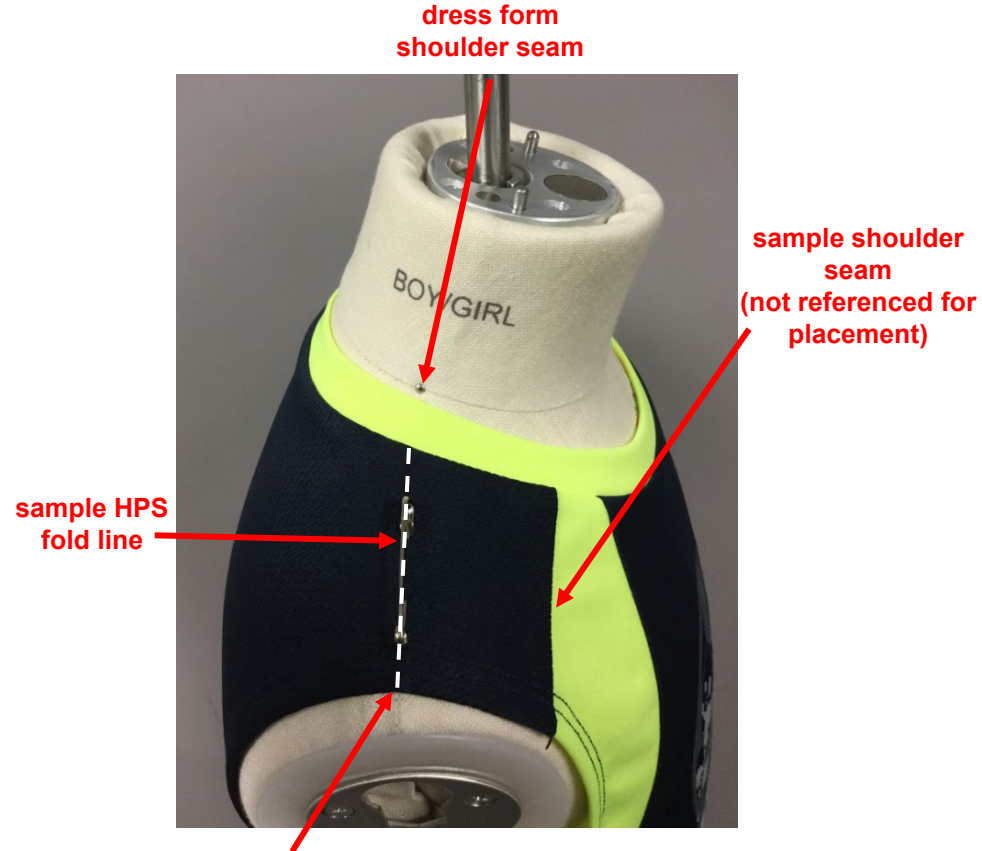
Maintaining Consistency Across Tools

Maintaining Consistency Across Tools

Tops : Confirming the HPS fold line placement between digital avatar, physical dress form, and as live model moves in garment will help drive consistency between our tools and each other

How to put a garment on the dress form

: Marking the HPS fold line on the garment vs. where it falls naturally on the form or model allows the KTD and CTD to ensure we can see the same balance and fit issues when reviewing. This also allows for consistent review between 3D digital avatar, dress form, and model.



Note placement of garment HPS fold line from dress form shoulder seam. Replicate placement on Avatar and live model for consistency.

HPS Fold Calibration Example

3D Fit: HPS fold line is sitting $\frac{1}{2}$ " behind shoulder seam of the digital Avatar



Dress Form: HPS fold line is sitting $\frac{1}{4}$ " in front of shoulder seam of dress form as placed by CTD



Live Model: HPS fold line is observed to be shifting further to back as live model moves in the garment



HPS fold placement differences between the tools may indicate a fit problem that needs to be addressed.



Maintaining Consistency Across Tools

Bottoms: Using & following the waist placement POMs will ensure consistency between digital avatar, physical dress form, and observing waist position as live model moves in garment will help drive consistency between our tools and each other.

How to put a garment on the dressform - Bottoms & Skirts

Place garment on the dressform following Waist Placement POMs: A003, A004, A005

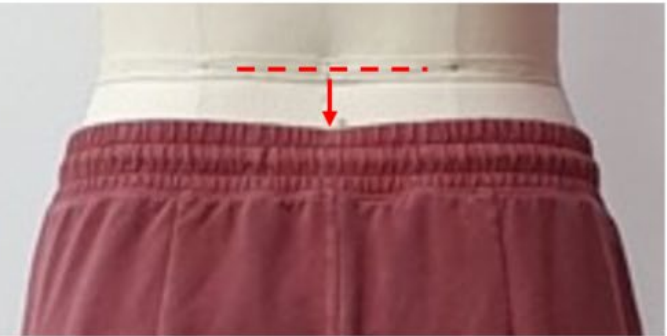
Center of waist tape
on dressform to top edge of
garment at CF



Center of waist tape
on dressform to top edge of
garment at side seam



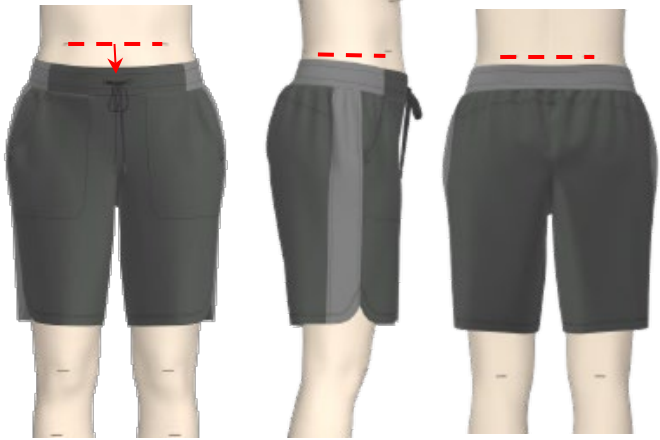
Center of waist tape
on dressform to top edge of
garment at CB



*Find this information under [How to Take a Photo on a Dress Form](#) found on [KLink](#)

Waist Placement Calibration Example

3D Fit: Digital garment placed using landmark tapes/measuring tools following Waist Placement on POM page



Dress Form: Garment placed using dress form landmarks or measuring from waist tape following Waist Placement on POM page.



Live Model: Observe Waist position on live model after model moves in garment. Does waist position change or adjust differently than the placement on the Dress form?



A change in Waist position on live model after movement may indicate a fit problem that needs to be addressed.



Dress Form vs Live Model

Compare the fit images on the dress form and live model. Garment follows an established spec.

- ❑ There are noticeable drag lines on the back view of the short on the live model, but drag lines are not apparent on the dress form.
- ❑ Should the fit be updated based on the appearance on the live model?

Dress Form :



Live Model :



KTD considers several factors when determining if a fit issue seen only on the live model should be corrected:

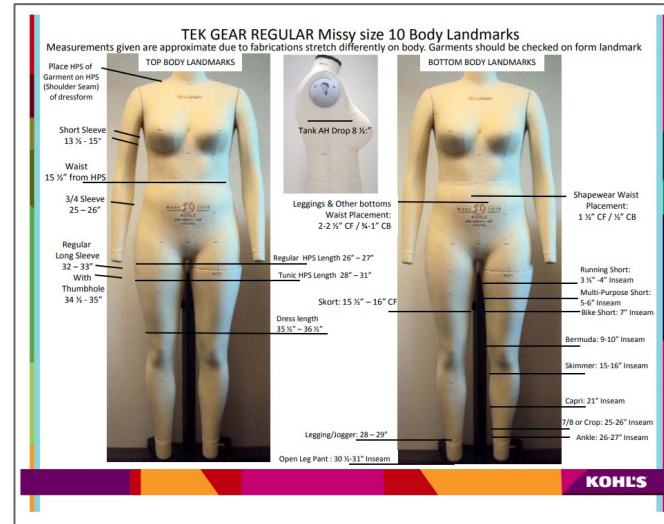
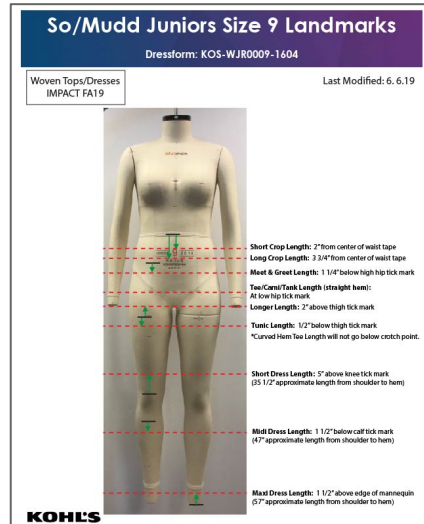
- ❑ Consider the shape of the live model. Is the model shaped differently than the dress form in a particular area?
- ❑ Does the model measure the same as the dress form, or have the model's measurements changed?
- ❑ Would the same issue occur on a different person?
- ❑ Are these fit issues commonly seen on this particular fit model, but not seen when a different model tries it on?
- ❑ Are the fit issues seen on the model caused by movement?
- ❑ Are changes needed for comfort while wearing?

There is not one standard answer that applies to all styles. KTD and CTD should work together to understand the root cause of the fit issue and best approach for correcting it.

Maintaining Consistency Across Tools

Dress Form Landmarks:

- ❑ Landmarks on the dress form are created for each brand and/or size range to ensure a consistent fit for the customer across multiple fabrications.
- ❑ The Technical Designer references the landmarks on the dress form to determine measurements for a new tech package, and throughout the fit process.
- ❑ Kohls Technical Designers utilize landmarks to communicate our fit intent to CTDs, with our cross functional partners and to the customer in store and online.



Fabrication & Spec Calibration Using

Landmarks

- Due to differences in fabric drape and elongation, Technical Design will adjust measurements to reflect the landmark on the form to meet the desired design aesthetic.



Spec - HPS 26"
On Body – 26.375"



Spec - HPS 26"
On Body 27.25"



Spec - HPS 26"
On Body – 27.75"

When Tools Change: Using a New Dress Form



Objective: Gain understanding of how to evaluate a new dress form and apply needed fit updates.



Old Dress Form vs New Dress Form

- ❑ Compare the shape of the old dress form and new dress form
- ❑ What differences do you see?
- ❑ How might these differences affect the fit of the garment?

NEW

OLD



NEW

OLD

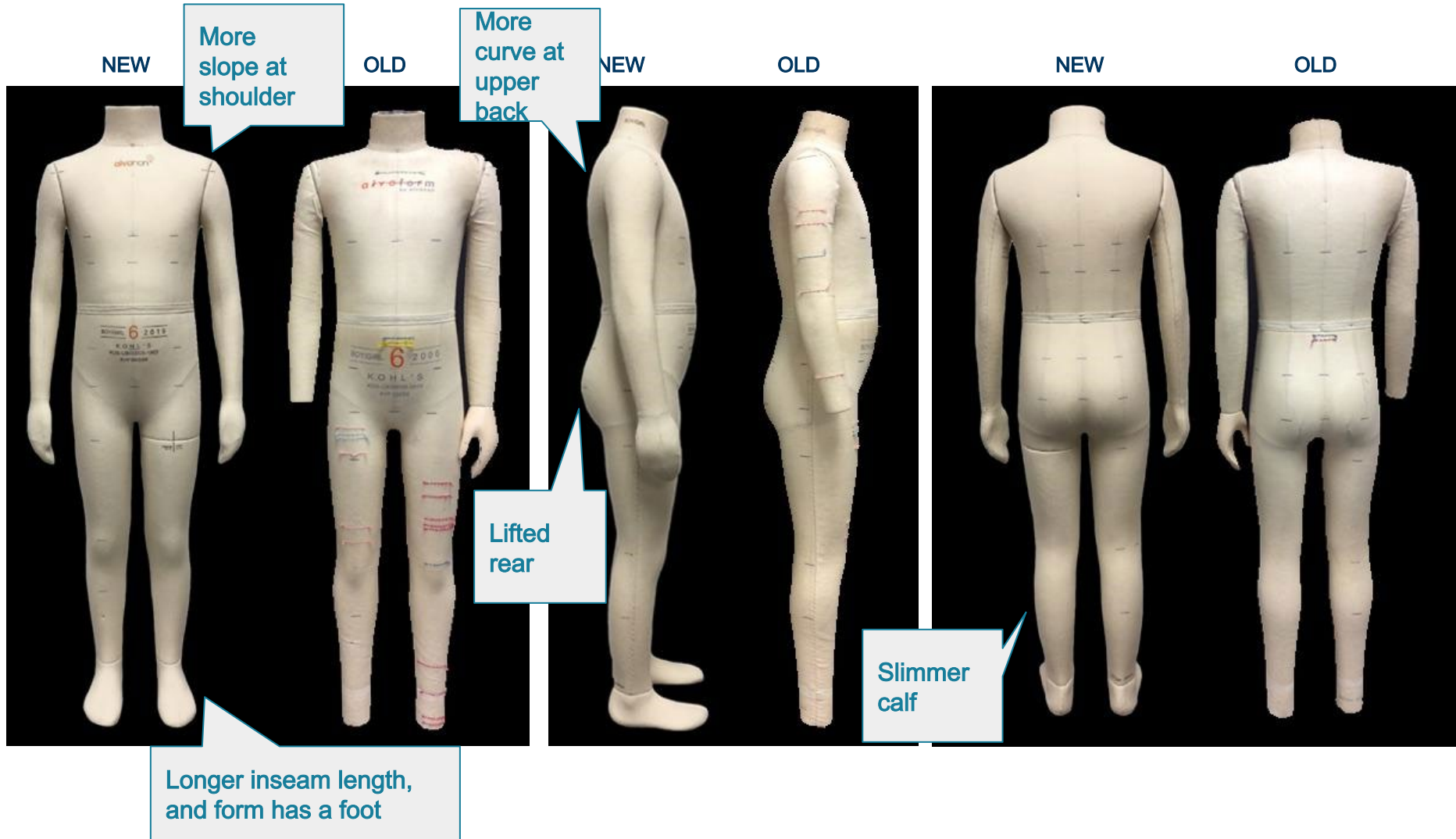


NEW

OLD



Old Dress Form vs New Dress Form



How do differences in dress form shape affect the fit?

Review previously approved garments on new dress form:

- ❑ Compare garment fit on old dress form and new dress form
- ❑ Note where and how the garment fits differently
- ❑ What fit updates might be needed?



How do differences in dress form shape affect fit?

NEW

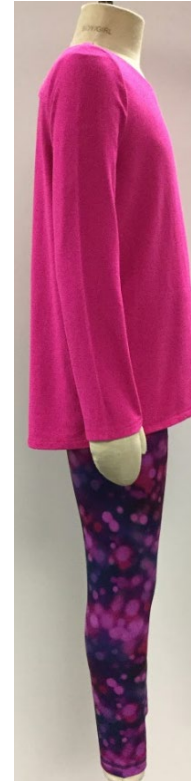
OLD

NEW

OLD

NEW

OLD

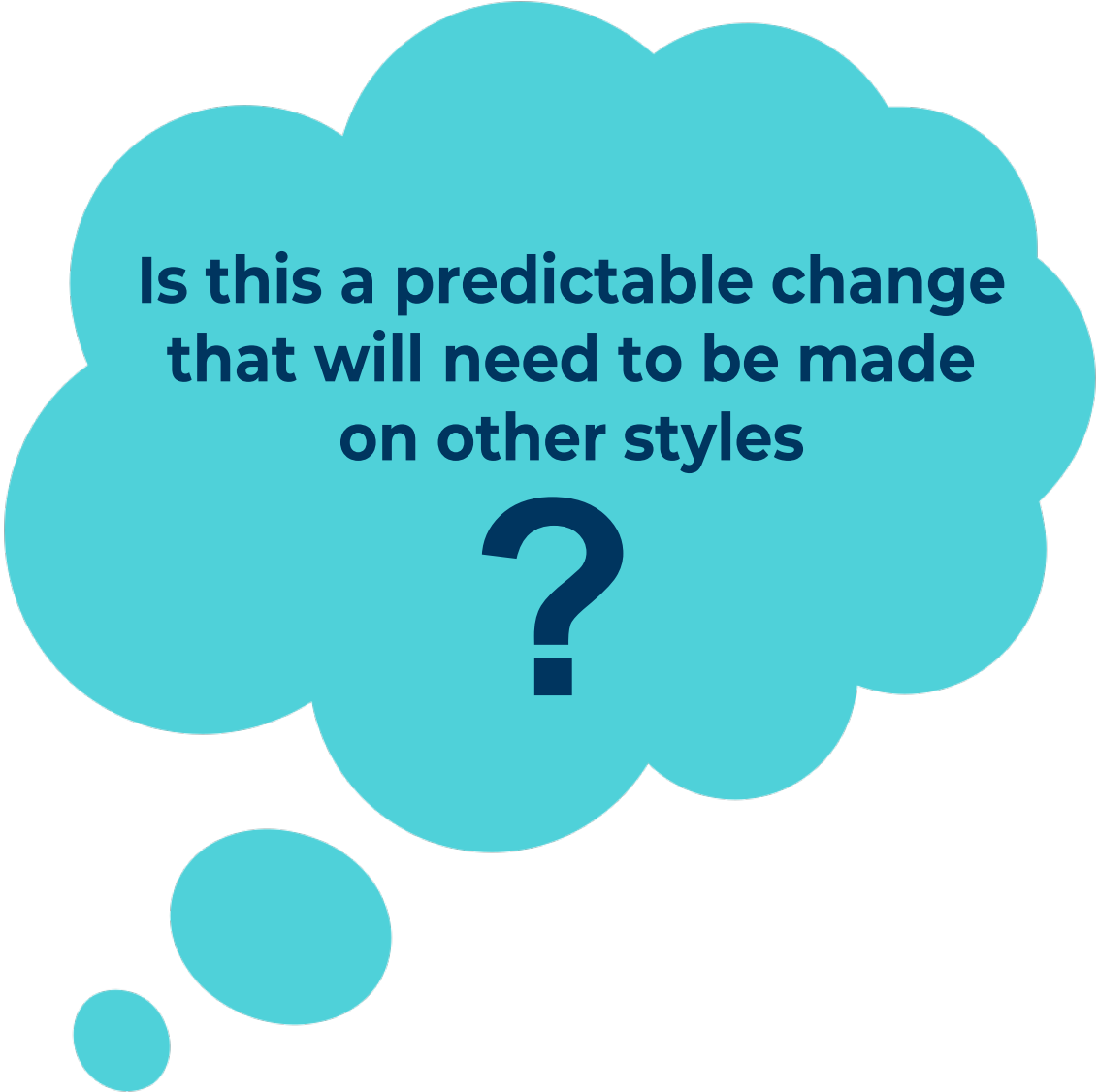


Side seam is collapsing. More shoulder slope is needed on the garment

Back panel is picking up due to more curve at upper back of form. Is this ok?

Inseam puddling at ankle since form now has foot. Is this the desired aesthetic?

Calf is narrower on form, is there too much ease?




**Is this a predictable change
that will need to be made
on other styles**

?

Known Fit Updates

- ❑ Some changes in the dress form shape will cause predictable changes that may need to be applied to most garments. Discuss with KTD as needed to align on planned fit updates.
- ❑ KTD will develop new season with predicted fit updates, and may do block development to verify fit updates quickly.
- ❑ CTD should ensure to follow new development specs and any new block patterns shared by KTD.
- ❑ Once fit updates are established, KTD and CTD should be proactive about applying the update.
- ❑ If it is necessary to reference a pattern that was approved on the old dress form, then all known fit updates should be applied to the pattern for the new dress form fit.



**Some areas of the garment look
different on the old dressform
and the new dressform.
Is that okay**

?

Unknown Fit Updates

- ❑ Some changes in the dress form shape will cause fit updates that are less clear, or take more time to discover.
- ❑ It is important that KTD & CTD partner together to identify any new fit updates that are needed.
- ❑ The garment may look different on the new dress form but that does not necessarily mean that a fit correction is needed. CTD should confirm with KTD if fit update is needed, or if appearance on the new dress form is acceptable.

Fit Updates Scenario - Answers

- ❑ The cap height was increased on our core Tee shirt on the new dress form. Will the cap height need to be increased on other T-shirt styles?
- ❑ The pant style looked tight across the seat on the new dress form. The KTD asked to increase the hip measurement and adjust rise shape. Will the same update be needed on other styles?
- ❑ The top is draping differently on the new form, but it is balanced and level at the hem. Is that ok?

✓ **Yes**

Most likely if a fit update is needed on a core style, similar styles may also need to be updated.

✓ **Yes**

Most likely a similar update will be needed on other styles.
The exact amount may vary style by style

✓ **Maybe**

If the garment is balanced, then a fit update may not be needed. Discuss desired aesthetic with KTD.

Fit Updates Scenario - Answers

❑ This style is a carryover from last year, but now there is a new dress form. Does it need to be refit?

✓❑ **Yes**

Once a new dress form is used for the season, all styles should be refit on the new dress form to ensure consistent fit for the customer. This includes carryover styles.

❑ There is a new dress form this season, but the Fit Library has not been updated yet. Can I use a pattern that was approved on the old dress form?

✓❑ **Maybe**

It takes time to rebuild the Fit Library once a new dress form is used, because it requires fit approved patterns which will be available at the end of the season. CTD can use an old pattern if it is the best starting place, but any Known fit updates should be applied. Partner with KTD on best pattern to start from.

Appendix

November 2020

Kohl's Dress Form Chart

- ❑ Kohls Dress forms/Avatars are listed by brand on the Kohls [Dress Form Chart](#) found on K-Link
- ❑ Use [Alvanon Order Form](#) to order physical dressforms, contact abp.support@alvanon.com to set up account to access Kohls [Virtual Alvanon Platform](#)



Private and Exclusive Brands

2

MONTHLY UPDATES

LABELS AND PACKAGING

PERFORMANCE TESTING

COLOR SERVICES

GLOBAL TECHNICAL DESIGN

Apparel Resource Tools

Apparel Body Charts & Grading Schematics

CTD OnePLM Manual

Apparel Assistant TD/CTD Level 1

Apparel Associate TD/CTD Level 2

Apparel Resource Tools

Kohl's private and exclusive branded apparel information, procedures, and templates.

Policies and Procedures

-  [Kohl's Fit Sample Policy](#)
-  [Required Fields on Fit Eval](#)
-  [Kohl's Fit Comment Template](#)
-  [Critical Points of Attention Expectations](#)

Dress Forms

-  [Dress Form Chart](#)
-  [Alvanon Order Form](#)

Kohl's Dress Form Chart



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▶ **Apparel Resource Tools**

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Schematics

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How to Fit on Form



[How to Take A Photo On A Dressform](#) (Last Updated: 05/08/2020)



[How to Fit Knit Tops](#) (Last Updated: 06/01/2018)



[How to Fit Woven Shirts](#) (Last Updated: 06/01/2018)



[How to Fit Mens Bottoms](#) (Last Updated: 06/01/2018)

Kohl's Alvanon Virtual Body Platform

- ❑ Access to every Kohls approved physical dress form in digital format in both dress form visual with seams included and human visual with head, hands, and feet.
- ❑ Additional body sizes and body shapes offered that are not available in physical dressforms
- ❑ Available for Clo, Browzwear, Optitex, & Shima Seiki 3D software

The screenshot displays the Alvanon Virtual Body Platform interface. The left sidebar contains the Alvanon logo and navigation options: Dashboard, Download Permission File, Virtual AlvaForms, Kohl's (selected), Alvanon Standard, Tutorial, and General Help. The main content area shows a grid of 8 digital dress forms, each with a unique ID, body type, and size.

ID	Body Type	Size
KOS-GPL0012-0705	Girl_Plus	12
KOS-MMN02XL-0705	Men_Large	2XL
KOS-MMN040H-1604	Men	40
KOS-UBG0006-1903	BOY/GIRL	6
KOS-UIFNWB-2001	Infant	Newborn
KOS-UTD003T-1907	TODDLER	3T
KOS-WJR0009-1604	Junior	9
KOS-WMS0008-1509	Women	8