

Material Science

Identification of common materials utilized in therapeutic footwear and orthoses



Orthoses: Devices that support or correct musculoskeletal deformities and/or abnormalities of the human body.

- The term is derived from the "ortho", meaning to straighten.
- They can be custom or non-custom.
- Orthoses are functional or accommodative.



Functional, custom orthotic



A5512

- Heat moldable
- Pre-fabricated
- Polyethylene and EVA
- Plastazote®

****Only a billable code when heated and molded to the foot****



The A5512, heat moldable insert must be heat molded to the patient's foot and achieve **total contact**. An external heat source, such as a heat gun or convection oven, should be used. The minimum temperature must reach **230°** to properly mold the insert.



All three pairs should be molded at the time of dispensing.



Customized Pads

Arch pad (scaphoid pad)

Heel wedge

Dancer's pad

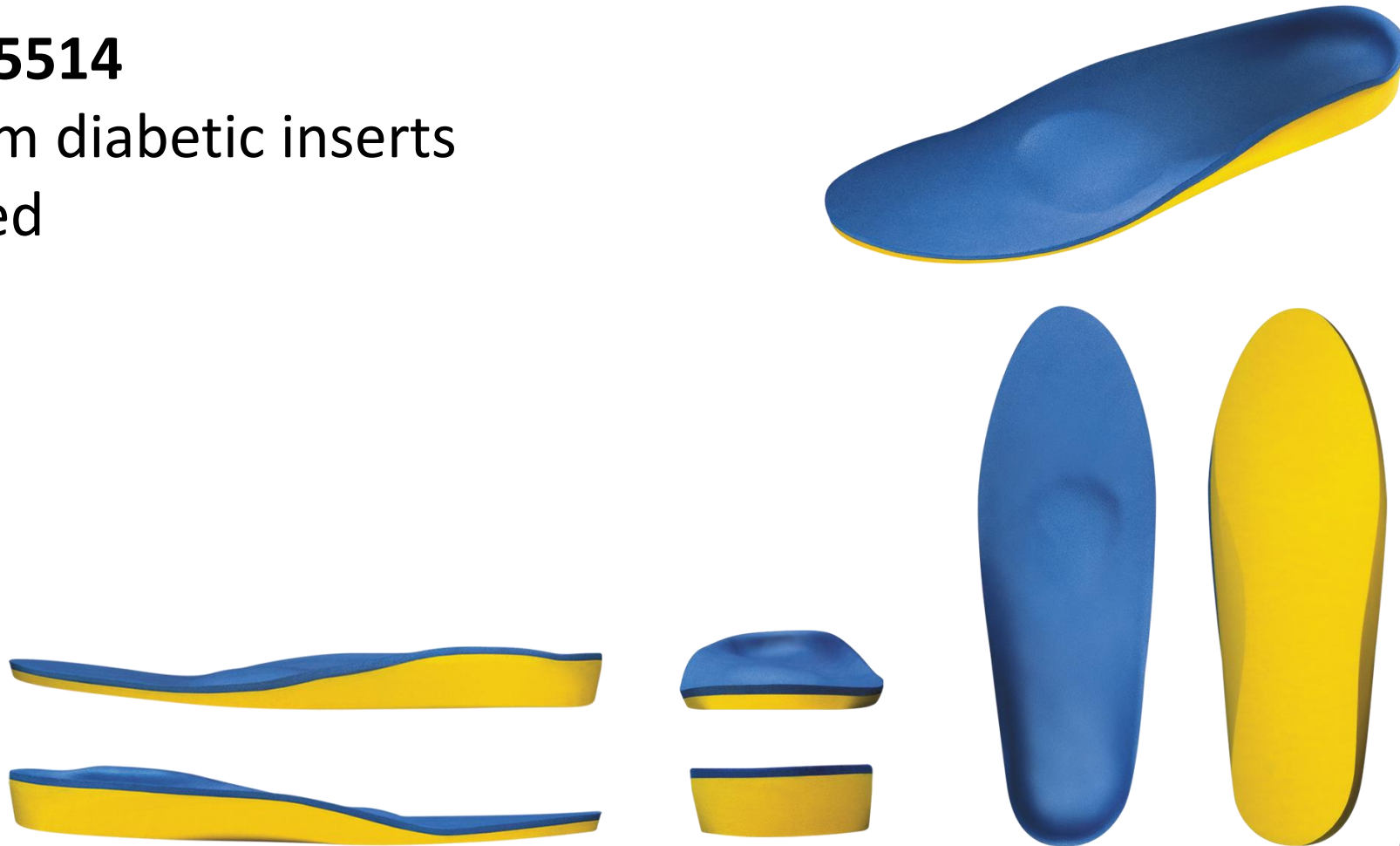
Metatarsal pad

Metatarsal bar



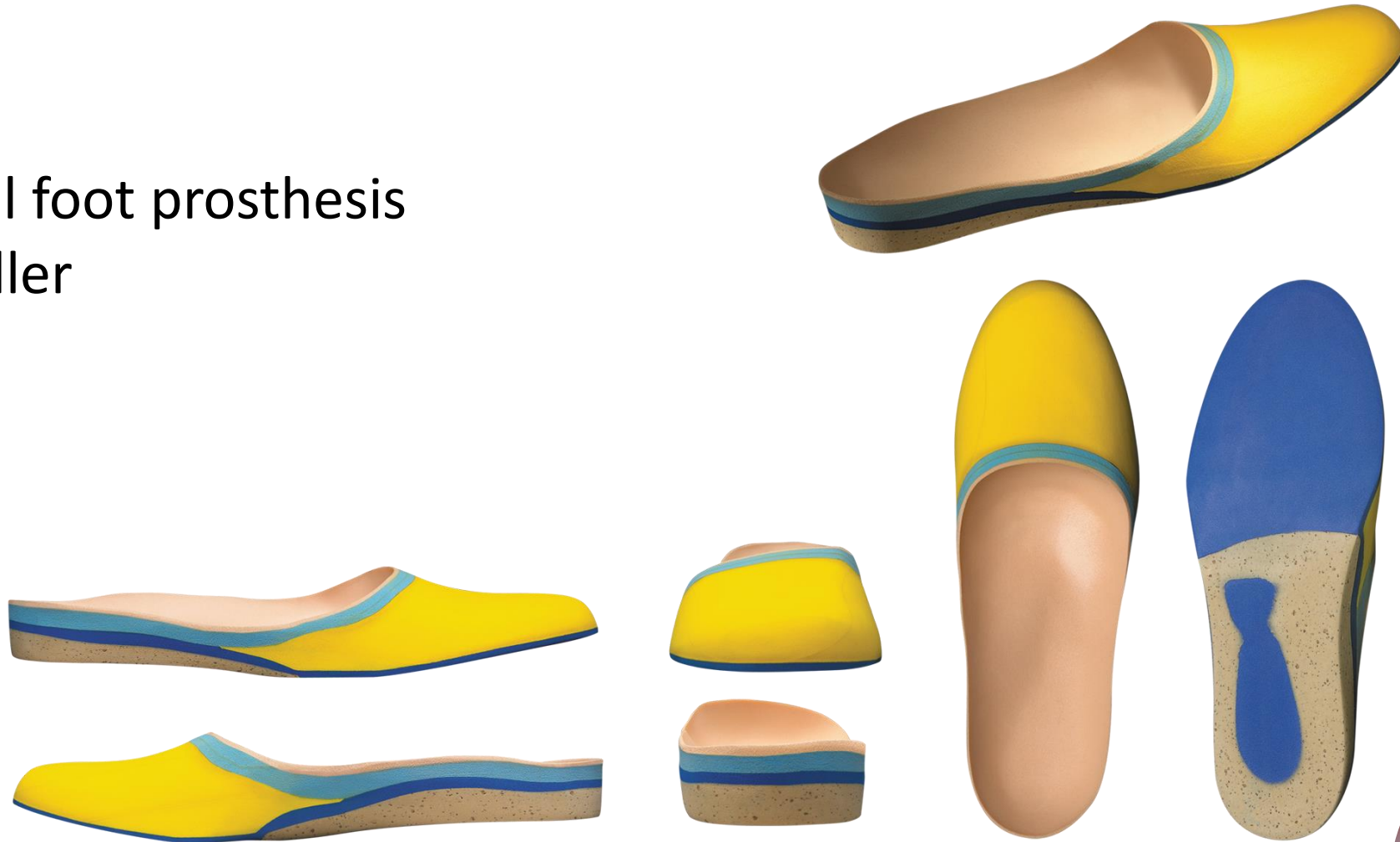
A5513/A5514

- Custom diabetic inserts
- Molded



L5000

- Partial foot prosthesis
- Toe filler



This is *not* in the CFTS scope of practice. Refer to a CPed, CO, CP or DPM.



Most manufacturers also offer non-coded inserts to accompany the shoes for either cash paying customers or those with different needs.



A **durometer** is the instrument used to measure the hardness or softness of materials.



The numerical readings from the durometer are also referred to as the “durometer” of the material.

The durometer reading increases with the hardness of the material.



Closed Cell Polyethylene (Plastazote®)

Used for diabetic and arthritic foot care needs

Pink

- Non-allergenic, lightweight, and can be used in direct contact with the skin
- Heat moldable, grindable
- Molds quickly to the foot during weight bearing, enhancing total contact

White

- Retains cushion longer than pink
- More supportive than pink



Ethylene Vinyl Acetate Foam (EVA)

An elastomeric polymer that produces materials which are "rubber-like" in softness and flexibility

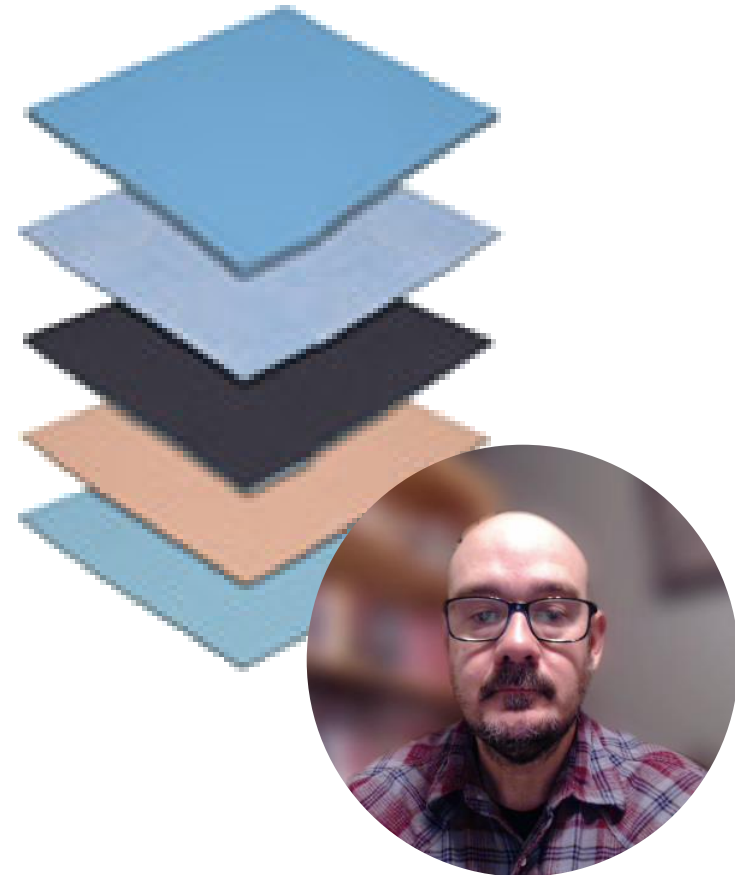
- Grindable
- Heat Moldable
- Glueable
- Heat molding temp. 250°-300 °
- Varying durometers and colors
- White (55) and Yellow (45)



Urethanes (PPT®/Poron®)

Breathable, lightweight, non-allergenic, and resists bottoming out under long-term wear; shock absorbency
Grindable and glues easily to all other orthotic and prosthetic materials.

Low durometer: 10-15



Cork Composite

Moldable material that makes a superior shell for a foot orthosis

Holds its shape and does not bottom out quickly, yet absorbs shocks and impact

- Moldable
- Grindable and glueable
- 55 durometer
- More rigid support



Leather Uppers

Calfskin—hides of calves; fine grain, soft, pliable, withstands hard wear (scuffing)

Kidskin—hides of goats; lightweight, yet strong and resilient.

Deerskin—hides of deer; soft and flexible; *not* durable - subject to holes and scarring

Pigskin—skins of pigs; used as sueded or brushed leather; often used in shoe linings.

Tanning-process of converting raw hides and skins into leather



Non-leather Uppers

Lycra® - Stretchy, breathable material perfect for accommodating forefoot deformities like bunions and claw toes

Wool – Lightweight, washable, soft, breathable and odor resistant

Canvas - Breathable, stretchable and durable

Printed PU - Breathable and fashionable

Mesh fabric – Breathable, soft material good for athletic shoes



Manmade: Vinyls and urethanes are common; sometimes used to make shoe uppers; lower in cost, low maintenance; inability to breathe and no memory retention.



Thank you!

