



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND GROUND VEHICLE SYSTEMS CENTER

GVSC Industry Days 2022-Materials Directorate

Brandon Pender

Materials Directorate, GVSC

Associate Director

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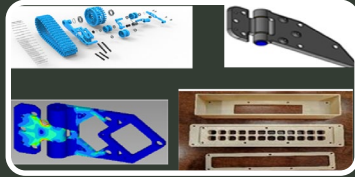
WHAT DO WE DO?



- **Provide technical expertise in materials engineering for the weapon system lifecycle from research to acquisition to sustainment.**
- **Technical competencies include:**
 - Lightweight materials maturation and integration
 - Design optimization/weight reduction
 - Materials selection & characterization (failure analysis)
 - Joining (welding, adhesives and mechanical fastening)
 - Additive manufacturing application
 - Coatings/corrosion
 - Hazardous materials management & environmental compliance



MATERIALS BRANCHES



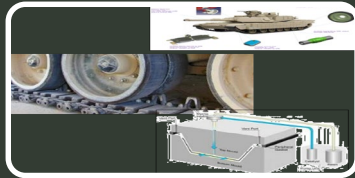
Application of Additive Manufacturing Technology

- S&T to develop manufacturing process/demonstrate the art of the possible
- Engage with AFC/DEVCOM/AMC and other orgs to shape Army policies/directives
- Contract requirements development and engineering support to the current acquisition programs
- Engineering support to TACOM ILSC/Depots by providing AM solutions to address supply chain issues



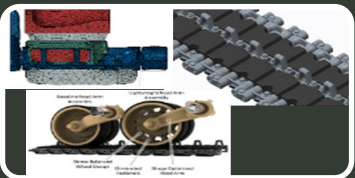
Joining Engineering

- S&T to develop/mature joining process/joint design, solutions for joining of dissimilar/multi-materials
- Engineering support to acquisition programs to include contract requirements, ensure OEM welding processes comply with requirements, engineering support to resolve joining issues
- Provide engineering support to the Depots and fielded systems with welding/joining issues including battle damage repair
- Fastener testing
- Adhesives



Materials Selection and Characterization

- Testing support, including failure analysis of components/subsystems to the PM offices and the sustainment teams
- Engineering support for materials selection, and vendor qualification to PM offices, Sustainment Teams
- Testing and engineering support to other GVSC orgs, as well as the Materials Branches
- ISO 17025 accreditation for many test methods



Materials Application and Integration

- S&T to mature Light weight material technologies/solutions
- Provide engineering solutions to PM office for weight reduction and design optimization
- Assess the impacts of lightweighting on mobility, transportability and supportability
- Determine the loads at a sub-system level to understand the design requirements
- Using Advanced Manufacturing for modernization



Environmental / Coatings and Corrosion

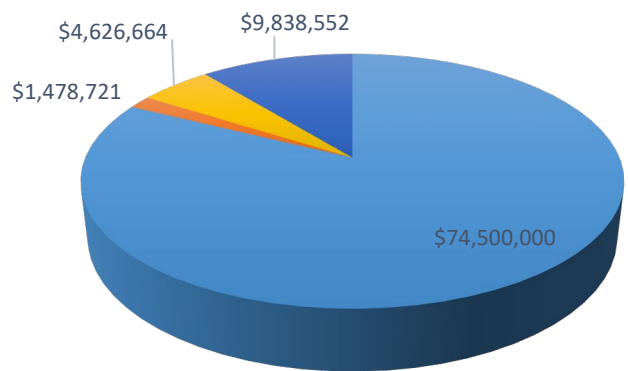
- **Environmental:** Engineering support for acquisition programs to include contract requirements for environmental management, hazardous materials elimination; development of environmental documents (PESHE; NEPA); IPT participation. Solve hazardous materials/environmental issues for fielded systems
- **Coatings/Corrosion:** Engineering support for acquisition programs to include contract requirements, work with OEMs on meeting requirements, guidance on CARC system and CPC design and other plating/coatings issues. Support to TACOM-ILSC for sustainment of fielded systems to include contract management for corrosion field surveys, updates to technical documents as well as solving field corrosion issue



MATERIALS FY22 FUNDING

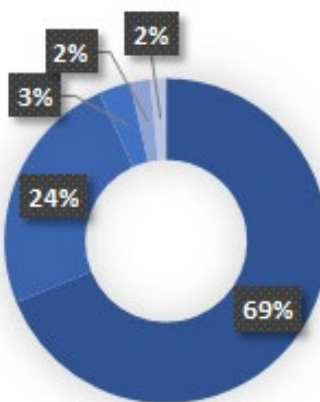


FY22 Overall Budget



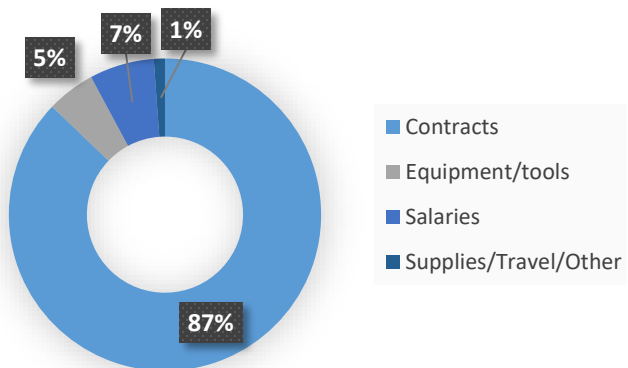
■ Congressional Ad ■ OH ■ OMA ■ RDT&E ■ Reimbursible

Reimbursable



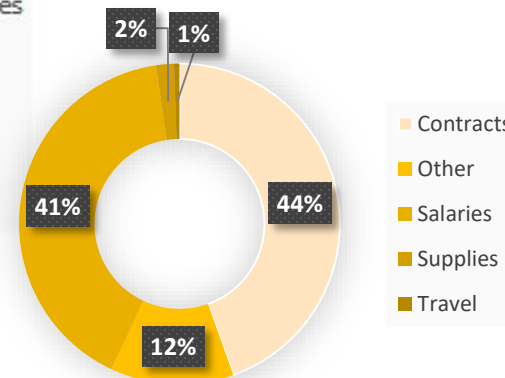
■ PEO/PM Offices
■ ILSC/TACOM
■ DLA
■ DEVCOM
■ Other

Cong Add



■ Contracts
■ Equipment/tools
■ Salaries
■ Supplies/Travel/Other

RDT&E



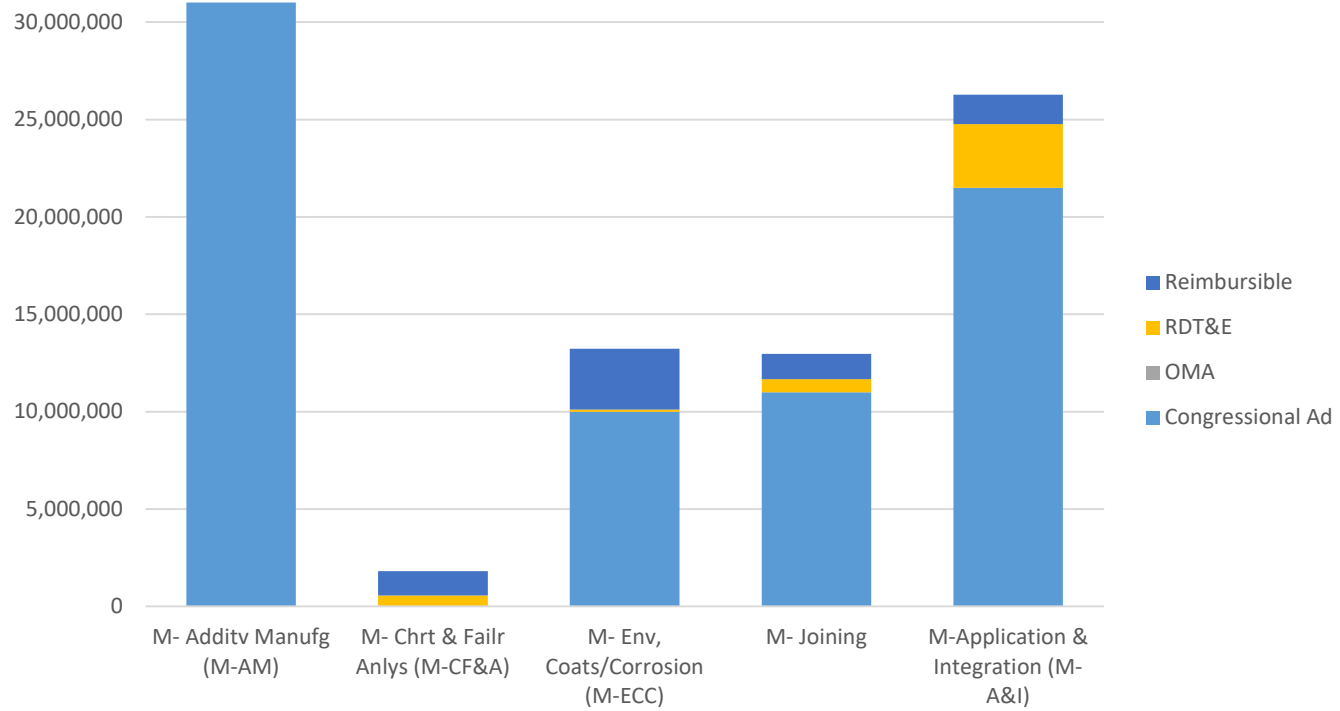
■ Contracts
■ Other
■ Salaries
■ Supplies
■ Travel



BREAKOUT BY BRANCH



Funding By Branch





BIG ROCKS/ORG PRIORITIES FY22-FY23



- **Lightweighting/Design Optimization**
 - Continue Advanced Lightweight running gear effort
 - Continue lightweighting/design optimization efforts with systems/components
 - Continue to find opportunities to gather loads data at component/sub-system level
- **Additive Manufacturing**
 - Integration of AM into supply chain and acquisition programs
- **Weld Standards**
 - MIL-STD-3057 - Arc welding of armor grade aluminum
 - Currently undergoing a new revision
 - Create procedure repository for the other Depots/Arsenals to leverage
- **Increase Demand for Materials Testing**
 - Continue to build a repository of material characterization in the AM space
- **CARC Paint Study**
 - Complete testing of commercial coatings to support informed decisions making



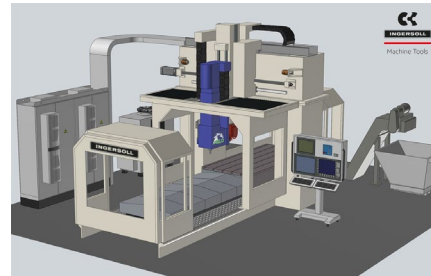
JOINTLESS HULL



- **Project Team:** Astro America, Ingersoll, MELD, Siemens
- **Vision:** To utilize additive manufacturing to enable weight reduction, increase the speed of the design cycle and manufacturability, and improve overall performance of combat vehicle hulls.
- **Project Objective:** Develop a tool that has vehicle hull size part production capability.
- **Challenge:** commercially available metal AM systems are not available to make parts at the desired size range.

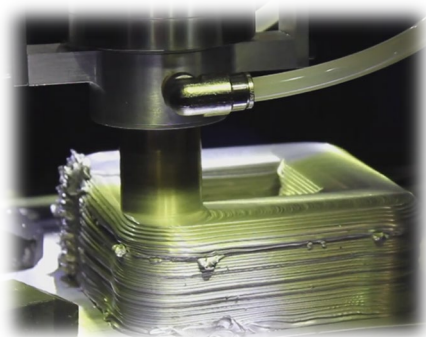
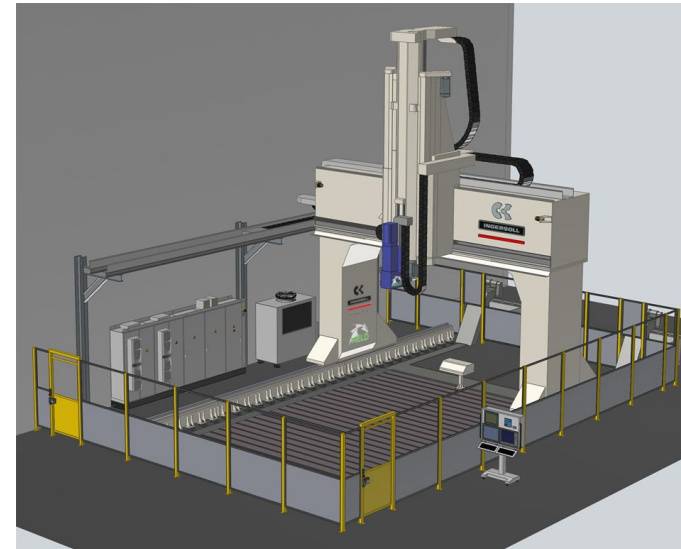
- **Subsection machine:**

- Located, GVSC, MI
- For components 3'x'3'x3'
- Install May 2022



- **Jointless Hull, hull-scale machine:**

- Located, Rock Island Arsenal, IL
- For components 20'x30'x10'
- Install May 2022
- Largest Metal 3D Printer Worldwide





AREAS WE COULD USE HELP



- Advanced manufacturing (AdvM) implementation
 - Bring us your business cases for AdvM
 - Knowledge of new AdvM technologies
 - Equipment
 - Materials
 - Processes
- Replacement of Hydrofluorocarbons (FM200 & R134A) for refrigerant
- Partnerships under Test Service Agreements



QUESTIONS



*Join my **Materials** team for One-on-One conversations at Table #2*