

ANNEX NO. 8  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
GLENN RESEARCH CENTER  
AND  
LOCKHEED MARTIN  
UNDER SPACE ACT UMBRELLA AGREEMENT  
NO. 34592, DATED 8/5/2021 (ANNEX NUMBER 08)

ARTICLE 1. PURPOSE

This Annex covers the testing of lunar tires at the NASA Glenn Research Center (GRC). The tires are being provided by Lockheed Martin and are intended for use on potential Artemis Commercial Lunar Payload Services (CLPS) rover missions. Testing will include traction evaluation in the NASA GRC Simulated Lunar Operations (SLOPE) Lab, and fatigue testing at temperature. NASA GRC will also be providing subject matter expertise on subsystem thermal vacuum testing at NASA Marshall Space Flight Center (MSFC).

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

A. NASA GRC will use reasonable efforts to:

1. Propose test plans for traction and fatigue testing.
2. Conduct traction testing on the vendor provided Spring Tires in the SLOPE Lab.
3. Conduct fatigue testing on the vendor provided Spring Tire at lunar temperatures in the Extreme Cyclic Environmental Load Test (XCEL) Rig.
4. Provide a report summarizing the test results, including raw data and photos.
5. Provide input on test plans for thermal vacuum testing at NASA MSFC on Spring tire.
6. Assess test results for thermal vacuum testing, including attending a portion of the tests in person.

B. Lockheed Martin will use reasonable efforts to:

1. Provide NASA with test articles for both traction and fatigue testing at NASA GRC.
2. Provide any custom fixturing needed for both traction and fatigue testing.
3. Provide final test plans for traction and fatigue testing.
4. Provide test plans for thermal vacuum testing and invite NASA GRC to key design/test readiness reviews.
5. Keep NASA GRC informed of thermal vacuum testing at NASA MSFC.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

1. NASA to implement custom fixturing into fatigue test rig. On or about April 2023.
2. NASA to complete traction testing in SLOPE Lab. On or about April 2023.
3. NASA to complete tire fatigue testing on XCEL Rig. On or about June 2023.
4. NASA to provide test report. On or about August 2023.
5. Lockheed Martin to complete thermal vacuum test readiness review. On or about May 2023.
6. Lockheed Martin to complete the thermal vacuum testing at MSFC. On or about December 2023.

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$589,838.00 for NASA to carry out its responsibilities under this Annex. Each payment shall be marked with NASA Glenn Research Center SAA8-2134592-08, Annex number 08.

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within one (1) year after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of two (2) years.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

The Disclosing Party's Background Data, if any, will be identified in a separate technical document.

2. Third Party Proprietary Data:

The Disclosing Party's Third-Party Proprietary Data, if any, will be identified in a separate technical document.

3. Controlled Government Data:

The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement: None.

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or three (3) years from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Management Points of Contact

NASA  
Arthur Werkheiser  
Advanced Concepts Office  
Marshall Space Flight Center  
Huntsville, AL 35812  
Phone: 256.544.1269  
[arthur.werkheiser@nasa.gov](mailto:arthur.werkheiser@nasa.gov)

LOCKHEED MARTIN  
SPACE Division  
Terry Abel  
MSFC Technical Liaison  
12257 South Wadsworth Blvd.  
Littleton, CO 80125-8504  
Phone: 256.656.5411  
[terry.abel@lmco.com](mailto:terry.abel@lmco.com)

Technical Points of Contact

NASA  
Colin Creager  
Aerospace Research Engineer  
21000 Brookpark Road  
Cleveland, OH 44135  
Phone: 216.433.6303  
[colin.m.creager@nasa.gov](mailto:colin.m.creager@nasa.gov)

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[terry.abel@lmco.com](mailto:terry.abel@lmco.com)

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION  
GLENN RESEARCH CENTER

LOCKHEED MARTIN  
SPACE

BY: \_\_\_\_\_  
Michael J. Barrett  
Director, Space Flight Systems Directorate

BY: \_\_\_\_\_  
Melinda McCord  
Subcontract Manager

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_