U.S. Department of Transportation
Federal Highway Administration

March 14, 2023

1200 New Jersey Ave., SE
Washington, D.C. 20590

In Reply Refer To:
HSST-1/CC-174

Roberto Impero
Industry AMS Srl
Via Dante Giacosa snc
81025 Marcianise (CE)
Italy

Dear Mr. Mauro:

We received your correspondence of February 28, 2022 requesting issuance of a reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively "device") described below. This letter is assigned Federal Highway Administration (FHWA) control number CC-174.

ELIGIBILITY LETTERS

The FHWA issues Federal-aid reimbursement eligibility letters for new roadside safety devices that are crash tested in accordance with the industry standard of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

FHWA, the Department of Transportation, and the United States (government) do not regulate roadside safety devices, crash test facilities, or the manufacturing industry. Issuance of eligibility letters is discretionary and provided only as a service to the states. FHWA may, at its discretion, decline to issue, revise, or rescind an eligibility letter. Eligibility letters are only issued by the FHWA headquarters Office of Safety.

Eligibility letters are issued only as notice to the states that a device is eligible for reimbursement under the Federal-aid highway program. They do not establish approval or certification for any other purpose. Issuance of an eligibility letter is not a prerequisite or requirement for state transportation agencies seeking to use Federal-aid funds for roadside safety devices. State agencies may use a device for which an eligibility letter has not been issued and seek Federal-aid reimbursement.

FEDERAL-AID REIMBURSEMENT

The request for issuance of this letter certified the device was crash tested in accordance with the industry standard of AASHTO's MASH. This eligibility letter is based on that certification and the material offered in support of its issuance. The device described below is eligible for reimbursement under the Federal-aid highway program.

Name of system: Hercules TL3 Wide
Type of system: Crash Cushion
Test Level: Test Level 3
Testing conducted by: CSI SPA
Date of request: February 28, 2022

Information about the device, including material such as the eligibility request, crash test reports, drawings, or images are included in one or more attachment(s) to this letter.

Eligibility letter CC-174 is inapplicable to devices, optional equipment, alternate materials, or other features that were not crash tested in accordance with AASHTO's MASH.

This letter is issued only for the subject device as crash tested under AASHTO's MASH. Later modification(s) of the device are not eligible for Federal-aid reimbursement under this letter. Notice of later modification(s) should be given to transportation agencies, facility owners, and operators (collectively "agencies").

Agencies should be provided appropriate information about the device's design, installation, maintenance, materials, and mechanical properties.

Issuance of this letter is discretionary, and it may be revised or rescinded at FHWA's discretion. This letter is not a determination of compliance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) or ownership of any intellectual property rights.

This eligibility letter is not a determination by the government that a crash involving the subject device will result in any particular outcome. It is limited to only the device's eligibility for Federal-aid reimbursement.

INTELLECTUAL PROPERTY

Issuance of this eligibility letter does not convey property rights of any sort nor any exclusive privilege. This letter is not authorization or consent by the government for the use, manufacture, or sale of any patented or proprietary system, device, design, product, or hardware for which the requester is not the patent owner. Eligibility letters are not an expression of any view, position, or determination by the government as to the validity, scope, or ownership of any intellectual property rights to a specific device. These letters do not grant, impute, suggest, or otherwise establish any ownership, distribution, or licensing rights to the requester. The government expresses no opinion about the intellectual property rights relating to any device for which this or any other eligibility letter is issued.

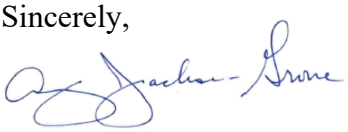
PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this eligibility letter is assigned FHWA control number CC-174. It should only be reproduced in full with its attachment(s). This letter and the material offered by the requester supporting its issuance is public information. All eligibility letters and supporting material are subject to public disclosure under the Freedom

of Information Act (FOIA). Eligibility letters are available to the public at https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

If you have any questions please contact Aimee Zhang at Aimee.Zhang@dot.gov.

Sincerely,



Amy Jackson-Grove
Acting Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	February 28, 2022	◉ New ○ Resubmission
	Name:	Roberto Impero	
	Company:	Industry AMS Srl	
	Address:	Via Dante Giacosa snc, 81025 Marcianise (CE)	
	Country:	Italy	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

Device & Testing Criterion - Enter from right to left starting with Test Level

!-!-!

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'CC': Crash Cushions, Attenuators, & Terminals	◉ Physical Crash Testing ○ Engineering Analysis	Hercules TL3 Wide	AASHTO MASH	TL3

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Individual or Organization responsible for the product:

Contact Name:	Roberto Impero	Same as Submitter ☒
Company Name:	Industry AMS Srl	Same as Submitter ☒
Address:	Via Dante Giacosa snc, 81025 Marcianise (CE)	Same as Submitter ☒
Country:	Italy	Same as Submitter ☒

Enter below all disclosures of financial interests as required by the FHWA `Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

Subject: Discolosure of financial interest
CSI Spa, is an independent research and testing laboratory having no affiliation with any another entity. The principals and staff of CSI Spa have no past or present financial, contractual or organizational interest in any company or entity directly or indirectly related to the products that CSI Spa tests.

PRODUCT DESCRIPTION

(●) New Hardware or Significant Modification ( ) Modification to Existing Hardware

Product Description
The Hercules Crash Cushion is a fully-redirective, non-gating crash cushion testet to MASH criteria. It has a frontal trolley unit thath allows a controlled deformation, a collapsable beam made up of a 10 modules thath crush in a frontal impact to absorb energy and stop the vehicle in a controlled manner, and 4-beam side panels for side impact redirection. The unit is a 19.4 feet (5.92m) long, 93 inches (2.36m) wide at the rear, and 35.0 inches (0.89m) high.
Note: Tl3 Hercules Wide Crash Cushion is designed to be attached to a rigid barrier that have a lateral stiffness lower than TL3 Crash Cushion
It is not possible to use this device in a condition where it might be struck in a reverse direction.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH criteria.

Engineer Name:	Massimo Cucchietti	
Engineer Signature:	Massimo Cucchietti Firmato digitalmente da Massimo Cucchietti Data: 2022.08.05 11:39:28 +02'00'	
Address:	Viale Lombardia 20, Bollate (MI)	Same as Submitter ☐
Country:	Italy	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-30 (1100C)	Test 3-30 involves a 1100C passenger car impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 0 degrees with the quarter point of the vehicle aligned with the center line of the crash cushion. This test is preliminary intended to evaluate occupanti risk and vehicle trajectory criteria. For this test a Honda Civic (1195 kg) impacted the Hercules TL3 Wide Crash Cushion at a speed 98.1 km/h and an angle of 0 degrees. Upon impact the vehicle forced the Hercules Crash Cushion's trolley rearward and began to collapse the beam modules. The crash cushion brought the vehicle to a controlled stop. The test vehicle sustained damage to its front end. The occupant compartment was not penetrated and the deformation was within allowable limits. The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria for test 3-30 - EVALUATION RESULTS: PASS	
3-31 (2270P)	Test 3-31involves a 2270P pick up truck impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 0 degrees with the center line of the vehicle aligned with the center line of the Crash Cushion. This test is preliminary intended to evaluate the capacity of the attenuator to stop the vehicle in a safe and controlled manner. For this test, a Chevrolet Silverado (2310 kg) impacted the Hercules TL3 Wide Crash Cushion at a speed 97.3 km/h and an angle of 0 degrees. Upon impact the vehicle forced the Hercules Crash Cushion's trolley rearward and began to collapse the beam modules. The crash cushion brought the vehicle to a controlled stop. The test vehicle sustained damage to its front end. The occupant compartment was not penetrated and the deformation was within allowable limits. The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria for test 3-31.- EVALUATION RESULTS: PASS	

Required Test Number	Narrative Description	Evaluation Results
3-32 (1100C)	Test 3-32 involves a 1100C passenger car impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 15 degrees with the centerline of the crash cushion. This test is preliminary intended to evaluate occupanti risk, vehicle trajectory and the capacity of the crash cushion to stop the vehicle in a controlled manner for an oblique impact. For this test a Honda Civic (1188.2kg) impacted the Hercules Crash Cushion at a speed 97 km/h and an angle of 15 degrees. Upon impact the vehicle forced the Hercules Crash Cushion's trolley rearward and began to collapse the beam modules. The crash cushion brought the vehicle to a controlled stop. The test vehicle sustained damage to its front end. The occupant compartment was not penetrated and the deformation was within allowable limits. The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria ror test 3-32.- EVALUATION RESULTS: PASS	
3-33 (2270P)	Test 3-33 involves a 2270P pick up truck impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 15 degrees with the centerline of the vehicle aligned with the center line of the crash cushion. This test is preliminary intended to evaluate occupanti risk, vehicle trajectory and the capacity of the crash cushion to stop the vehicle in a controlled manner for an oblique impact. For this test a Chevrolet Silverado (2317 kg) impacted the Hercules Crash Cushion at a speed 99.1 km/h and an angle of 15 degrees. Upon impact the vehicle forced the Hercules Crash Cushion's trolley rearward and began to collapse the beam modules. The crash cushion brought the vehicle to a controlled stop. The test vehicle sustained damage to its front end. The occupant compartment was not penetrated and the deformation was within allowable limits. The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria for test 3-33. - EVALUATION RESULTS: PASS	

3-34 (1100C)	Test 3-34 involves a 1100C passenger car impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 15 degrees with the CIP at the point where the crash cushion behavior changes from capturing to redirective. This test is preliminary intended to evaluate occupant risk and vehicle trajectory criteria. For this test a Honda Civic 1193 kg impacted the Hercules Crash Cushion at a speed 97.5 km/h and an angle of 15 degrees. The impact point was downstream the trolley. Upont the impact the vehicle was smoothly redirected. The test vehicle sustained damage to its right front corner, doors and rear quarter panel. The occupant compartment was not penetrated and the deformation was within allowable limits. The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria for test 3-34. - EVALUATION RESULTS:PASS	
3-35 (2270P)	Test 3-35 involves a 2270P pick up truck impacting the crash cushion at a nominal impact speed of 100 km/h and an impact at 25 degrees with the CIP at the point where the crash cushion behavior changes from capturing to redirective (BLON). This test is preliminary intended to evaluate the capacity of the attenuator for redirection/ containment of heavy vehicles. For this test a Chevroled Silverado 2276.2 kg impacted the Hercules Crash Cushion at a speed 97.7 km/h and an angle of 25 degrees. The impact point was downstream the trolley and very near to the nose. Upont the impact the vehicle was smoothly redirected. The test vehicle sustained damage to its left front corner, doors and rear quarter panel. The occupant compartment was not penetrated . The maximum roll and pitch angles did not exceed 75 deg. and the occupant risk values were within limits per the MASH specifications for OIV and ORA. Hercules Crash Cushion passed all evaluation criteria for test 3-35. - EVALUATION RESULTS: PASS	
3-36 (2270P)	Test 3-36 Hercules TL3 Wide is not attached to a rigid backup structure	
3-37 (2270P)	Test 3-37 Hercules TL3 Wide is not installed in reverse impact condition	
3-38 (1500A)	Numerica Simulation was performed	

3-40 (1100C)	Test for non-redirective Crash Cushion, Not Applicable	
3-41 (2270P)	Test for non-redirective Crash Cushion, Not Applicable	
3-42 (1100C)	Test for non-redirective Crash Cushion, Not Applicable	
3-43 (2270P)	Test for non-redirective Crash Cushion, Not Applicable	
3-44 (2270P)	Test for non-redirective Crash Cushion, Not Applicable	
3-45 (1500A)	Test for non-redirective Crash Cushion, Not Applicable	

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test Laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	CSI SPA	
Laboratory Signature:	Massimo Cucchietti Firmato digitalmente da Massimo Cucchietti Data: 2022.08.05 11:40:10 +02'00'	
Address:	Via Dante Giacosa snc, 81025 Marcianise (CE)	Same as Submitter ☒
Country:	Italy	Same as Submitter ☒
Accreditation Certificate Number and Dates of current Accreditation period :	Accretitation N.0006L rev.05 expiring date 08-03-2024	

Submitter Signature*: Impero Roberto Firmato digitalmente da Impero Roberto Data: 2022.10.12 10:58:05 +02'00'

Submit Form

ATTACHMENTS

Attach to this form:

1) Additional disclosures of related financial interest as indicated above.
2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words