Ballistic Evaluation of 03 Sets of Ballistic Rubber Blocks

Report No. : **DRDO-TBRL-BEM-EVR-43-2020**

User : **Sunflex Recycling Pvt. Ltd., Ahmedabad**

Test Report TBRL
Copy No. 1

Ballistic Evaluation of Materials Group
Terminal Ballistics Research Laboratory
Sector 30, Chandigarh – 160 030

REPORT DOCUMENTATION PAGE

1.	*Title*	: *Ballistic Evaluation of 03 Sets of Ballistic Rubber Blocks*			
2.	Report No.	: DRDO-TBRL-BEM-EVR-43-2020			
3.	Classification	: Restricted	4.	Date of issue	: 07/09/2020
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9.	Distribution	: (a) Sunflex Recycling Pvt. Ltd., Ahmedabad (b) DH, BEM			
10.	Abstract	: 06 Nos. (03 sets) of Ballistic Rubber Blocks were submitted by Sunflex Recycling Pvt. Ltd., Ahmedabad for ballistic evaluation. As per user requirements 7.62x39mm MSC, 7.62x51mm and 5.56x45mm ammunitions were fired on each set of Ballistic Rubber Blocks (02 Blocks). 05 fair shots were fired on each set. Ballistic Rubber Blocks were able to withstand all the ammunitions.			
11.	Prepared by	:			

Sonukumar. 04/09/2020

(Sonu Kumar), TO 'A'

Trial Officer

Reviewed by :	Approved by :
4/9/20.	7/9/2020
(Dr. Debarati Bhattacharjee), Sc. 'E'	(Ipsita Biswas), Sc. 'G'
DH : BEM	GD : BEM & HSRS

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Notes :

1. The test articles were brought to TBRL by the Firm's (user) representative as per their own specifications/fabrication process & were not collected from any production lot.
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SUMMARY OF RESULTS

No. of Sample : 03 Type of Test : Perforation/ Non Perforation

S. No.	Sample ID	Ammunition	Weapon	No. of fair Shots	Velocity (m/s)			Perforation
					Max.	Min.	Ref.	
1	Sunflex/Set-1/R.Block-1 + R.Block-2	7.62x39mm MSC	AK 47	05	706.5	697.4	700±10	No
2	Sunflex/Set-2/R.Block-1 + R.Block-2	7.62x51mm	Bolt Action	05	844.3	830.9	838±15	No
3	Sunflex/Set-3/R.Block-1 + R.Block-2	5.56x45mm	INSAS	05	873.1	856.4	860±15	No

Remarks: nil

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A SAMPLE ID: Sunflex/Set-1/R.Block-1 + R.Block-2 | **B SAMPLE CONDITIONING:** NA

C PHYSICAL VERIFICATION

Type of Sample	:	Rubber Block	Thickness (mm)	:	300, 300	Observations	:	NIL
Length (mm)	:	500, 500	Material	:	-			
Width (mm)	:	300, 300	Layers/Plies	:	-	Ref. Letter	:	Email
Weight (kg)	:	38.40, 38.25	Construction	:	-	Date Recd.	:	29.06.2020

D TRIAL SET – UP

Location	:	Ballistic Test Facility	**Distances from target (m)**			**Range Conditions**		
Ref. document	:	SOP: TBRL/BEM/TP-01/12	Weapon	:	10.0	Temperature (° C)	:	21.3
Backing material	:	NA	Velocity Screens	:	2.5	Relative Humidity (%)	:	57
Witness Plate	:	0.5mm Al. Sheet	Witness Plate	:	0.15			

E BACKING MATERIAL CONDITIONING

DROP No.	1	2	3	4	5	Average	Requirement
Depth of Indentation (mm)	NA						

F BALLISTIC EVALUATION

Ammunition			**Weapon**		
Type	:	7.62x39mm MSC	**Type**	:	AK 47
Lot No/Year	:	21/06	**Regn. No.**	:	TN 1659

Shot No.	Velocity (m/s)	Impact Angle (°)	Impact Result	Fair/ Unfair
1	705.2	0°	Not Perforated	Fair
2	703.6	0°	Not Perforated	Fair
3	703.5	0°	Not Perforated	Fair
4	697.4	0°	Not Perforated	Fair
5	706.5	0°	Not Perforated	Fair

Remarks: ***All the shots were stopped in R. Block-1***

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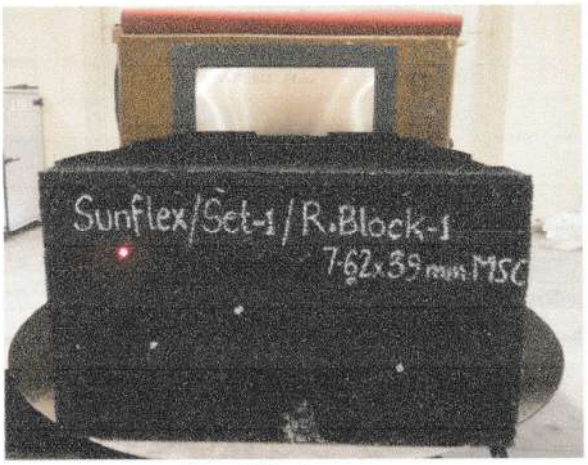
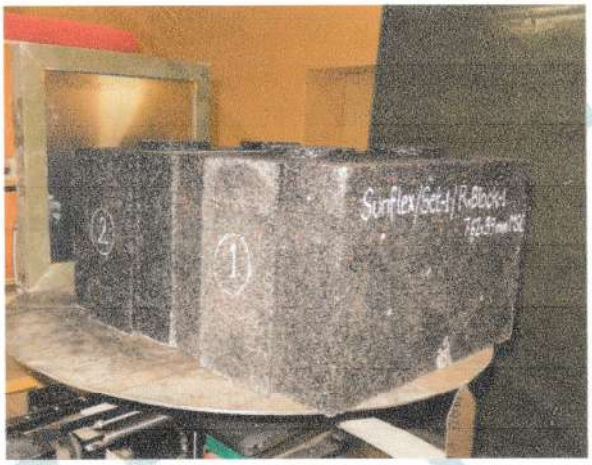
G SAMPLE ID: Sunflex/Set-1/R.Block-1 + R.Block-2

PHOTOGRAPHS (BEFORE TRIAL)

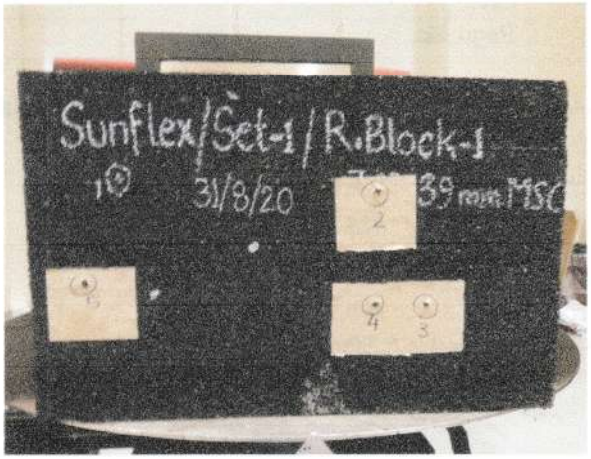


(Front View)

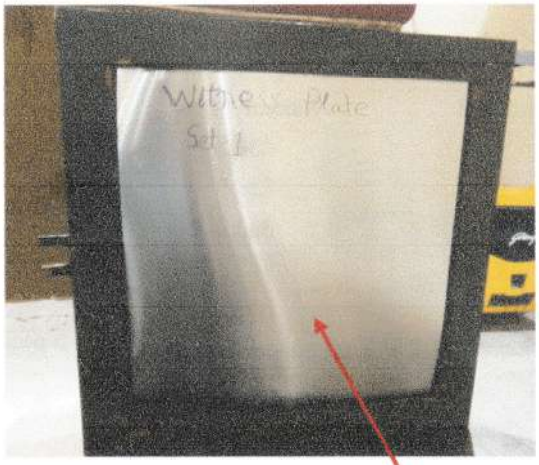


(Side View)

PHOTOGRAPHS (AFTER TRIAL)



(Front View)



Witness Plate

Notes :

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A SAMPLE ID: Sunflex/Set-2/R.Block-1 + R.Block-2 | **B SAMPLE CONDITIONING:** NA

C PHYSICAL VERIFICATION

Type of Sample	:	Rubber Block	Thickness (mm)	:	300, 300	Observations	:	NIL
Length (mm)	:	500, 500	Material	:	-			
Width (mm)	:	300, 300	Layers/Plies	:	-	Ref. Letter	:	Email
Weight (kg)	:	38.55, 38.40	Construction	:	-	Date Recd.	:	29.06.2020

D TRIAL SET – UP

Location	:	Ballistic Test Facility	**Distances from target (m)**			**Range Conditions**		
Ref. document	:	SOP: TBRL/BEM/TP-01/12	Weapon	:	10.0	Temperature (° C)	:	21.3
Backing material	:	NA	Velocity Screens	:	2.5	Relative Humidity (%)	:	57
Witness Plate	:	0.5mm Al. Sheet	Witness Plate	:	0.15			

E BACKING MATERIAL CONDITIONING

DROP No.	1	2	3	4	5	Average	Requirement
Depth of Indentation (mm)	NA						

F BALLISTIC EVALUATION

Ammunition			**Weapon**		
Type	:	7.62x51mm	**Type**	:	Bolt Action
Lot No/Year	:	OFV 90	**Regn. No.**	:	Y 5905

Shot No.	Velocity (m/s)	Impact Angle (°)	Impact Result	Fair/ Unfair
1	836.2	0°	Not Perforated	Fair
2	836.5	0°	Not Perforated	Fair
3	830.9	0°	Not Perforated	Fair
4	842.2	0°	Not Perforated	Fair
5	844.3	0°	Not Perforated	Fair

Remarks: *3rd & 5th shot got perforated through R.Block-1 and stopped in R.Block-2*

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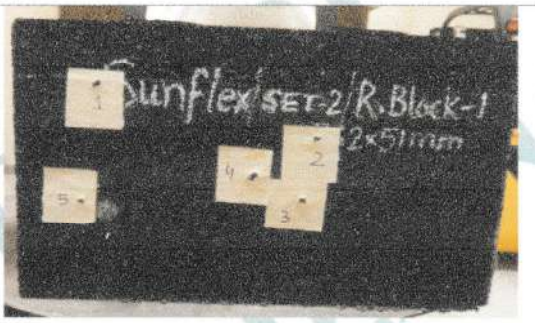
G SAMPLE ID: Sunflex/Set-2/R.Block-1 + R.Block-2

PHOTOGRAPHS (BEFORE TRIAL)

(Front View)

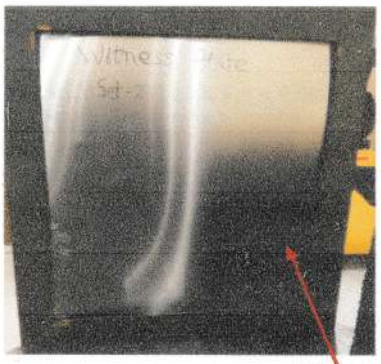
(Side View)

PHOTOGRAPHS (AFTER TRIAL)



(Front View)

(Rear view of block-1)



Witness

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A SAMPLE ID: Sunflex/Set-3/R.Block-1 + R.Block-2 | **B SAMPLE CONDITIONING:** NA

C PHYSICAL VERIFICATION

Type of Sample	:	Rubber Block	Thickness (mm)	:	300, 300	Observations	:	NIL
Length (mm)	:	500, 500	Material	:	-			
Width (mm)	:	300, 300	Layers/Plies	:	-	Ref. Letter	:	Email
Weight (kg)	:	38.40, 37.95	Construction	:	-	Date Recd.	:	31.08.2020

D TRIAL SET – UP

Location	:	Ballistic Test Facility	**Distances from target (m)**			**Range Conditions**		
Ref. document	:	SOP: TBRL/BEM/TP-01/12	Weapon	:	10.0	Temperature (° C)	:	21.3
Backing material	:	NA	Velocity Screens	:	2.5	Relative Humidity (%)	:	57
Witness Plate	:	0.5mm Al. Sheet	Witness Plate	:	0.15			

E BACKING MATERIAL CONDITIONING

DROP No.	1	2	3	4	5	Average	Requirement
Depth of Indentation (mm)	NA						

F BALLISTIC EVALUATION

Ammunition			**Weapon**		
Type	:	5.56x45mm	**Type**	:	INSAS
Lot No/Year	:	OFV 04	**Regn. No.**	:	15823584

Shot No.	Velocity (m/s)	Impact Angle (°)	Impact Result	Fair/ Unfair
1	873.1	0°	Not Perforated	Fair
2	868.7	0°	Not Perforated	Fair
3	868.1	0°	Not Perforated	Fair
4	861.5	0°	Not Perforated	Fair
5	856.4	0°	Not Perforated	Fair

Remarks: ***All the shots were stopped in R.Block-1***

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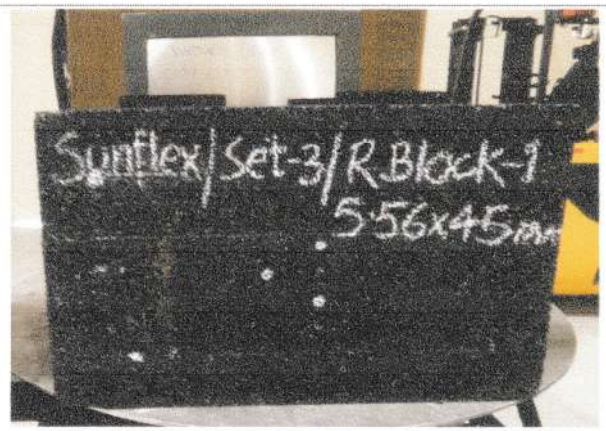

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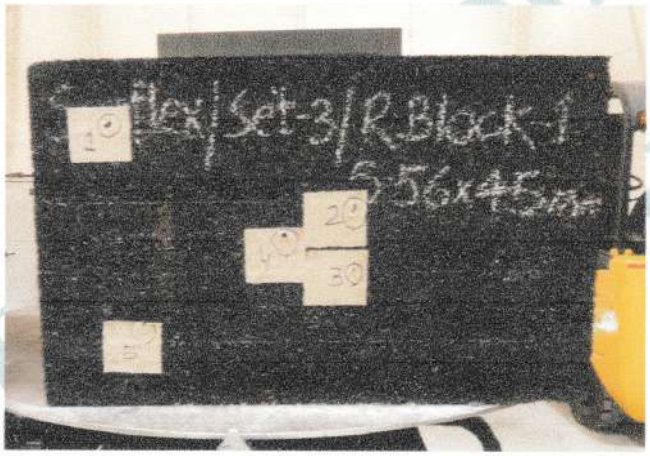

(Front View)

Witness Plate

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