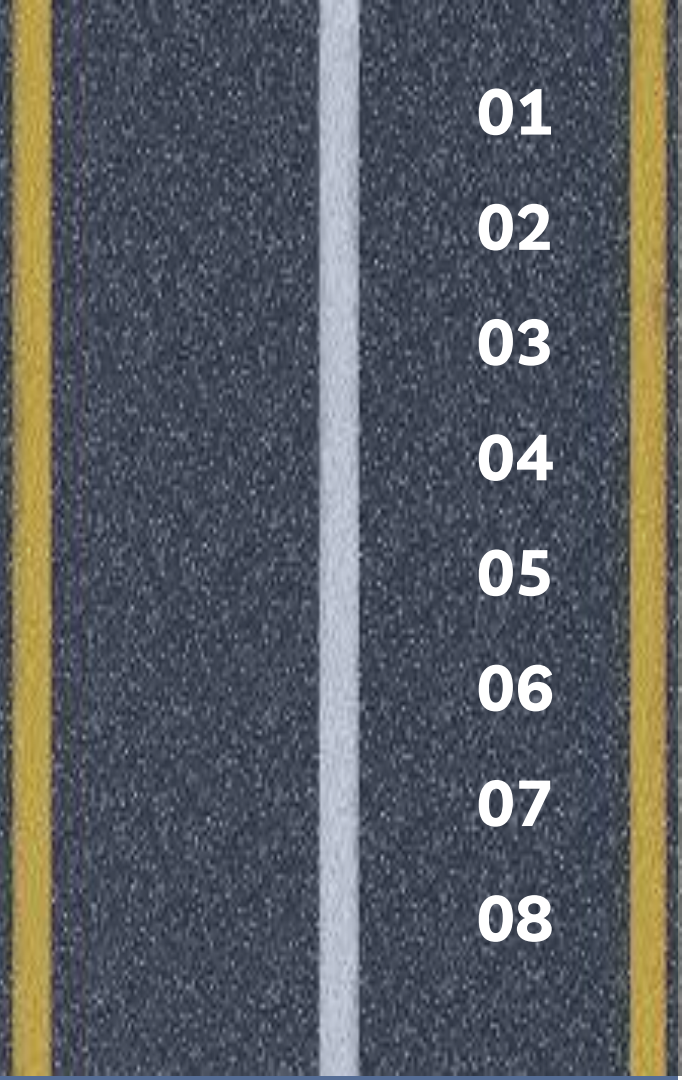
MALAYA ENGINEERING

ASPHALT+

VESTENAMER ® + CRMA PREMIXED (SPECIAL PREMIX)

MALAYA ENGINEERING SENDIRIAN BERHAD



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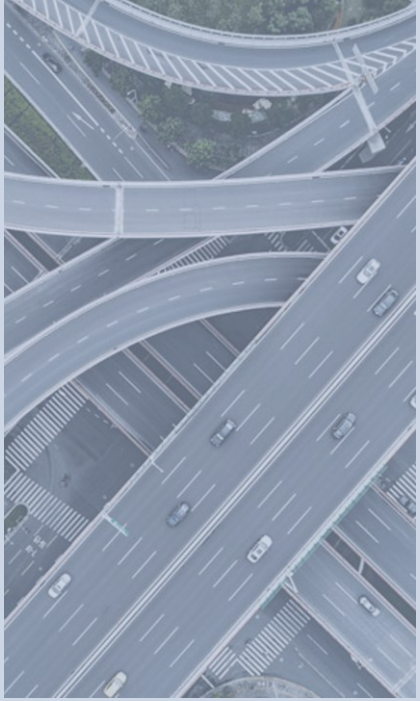
ABOUT US

MALAYA ENGINEERING

Malaya Engineering Sendirian Berhad is a building and road construction company with CIDB class G4 and other licenses. Our nature of business involves road and building construction as well as maintenance.

We partner up with Evonik Industries AG (a stock-listed German specialty chemicals company headquartered in Germany) to produce Asphalt+ , a refined product development of Malaysia's rubber powder since 2022.

Asphalt+ consist of Malaysian rubber powder and Vestenamer® (a modifier developed by Evonik Industries AG). Malaya Engineering Sendirian Berhad is the authorised exclusive distributor for Vestenamer®.



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PROBLEM STATEMENT

MAIN PROBLEM: WASTE TYRES IN MALAYSIA

- About 60% of the waste tyres are **disposed via unknown routes**. ii. Waste tyres in Malaysia are neither categorized as solid waste or hazardous waste.
- Currently there is no institutional approach for managing waste tyre as a resource in Malaysia.
- Collaborating with Evonik Industries AG, a publicly traded German company specializing in chemicals, based in Germany.
- Creating Asphalt+, an enhanced iteration of Malaysia's rubber powder through joint efforts.

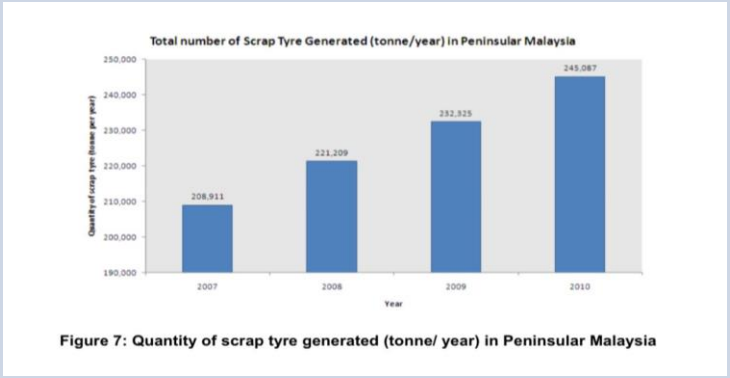
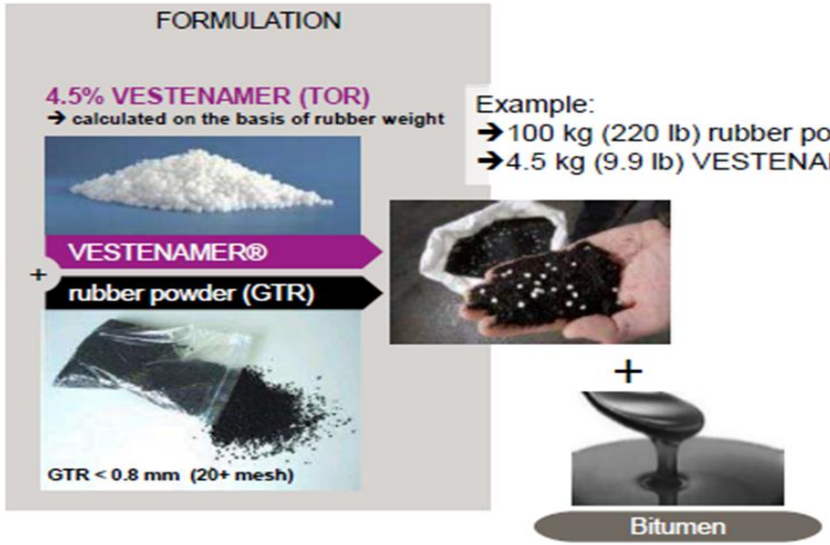


Figure 7: Quantity of scrap tyre generated (tonne/ year) in Peninsular Malaysia

Source: Ministry of Housing & Local Government, National Solid Waste Management Dept. (Sept 2011)



ASPHALT+

A HIGH-QUALITY ELASTOMER AND ASPHALT MODIFIER

AN ADVANCED PRODUCT DEVELOPMENT FOR EASY USE

Asphalt+ is an elastomeric (CRMA) and asphalt modifier (VESTENAMER) manufactured in compliance with a process patented by Evonik Industries. Ingredients are high-quality Malaysian rubber powder mixed with 4.5% Vestenamer®, produced by Evonik.

It can be delivered in separate packaging for the asphalt/bitumen supplier to mix at the mixing plant/blending facility **wet processing** or **dry processing.**

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WHERE TO USE

ASPHALT+ CAN BE USED IN ANY ASPHALT AND BITUMEN APPLICATION

Asphalt+ can be used in any asphalt application, be it stone mastic (SMA), all kinds of asphalt concrete (AC), porous asphalt (PA) or mastic asphalt (MA).

Asphalt+ may also be used in any type of bitumen.

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ADVANTAGES OF ASPHALT+

- **Easier and Less Time Consuming** – No need to clean tanks and trucks with release agent
- **No Additional Machineries on Site** – Only use Macadam Roller and Tandem Roller
- **Improve Durability** – Increase the resilience of the asphalt mix & more resistance to cracking and rutting
- **Reduce Maintenance Costs** – Require less frequent maintenance and repairs.
- **Noise Reduction** - The voids or gaps in gap-graded materials & CRMA materials can trap and absorb sound waves
- **Improved Skid Resistance** – Enhance road safety by reducing the risk of accidents
- **Superior Performance** – Stability and Flow increase compared to existing CRMA specification.
- **Green Environment** – No emission of N-nitrosamines & Lower emission of volatile and semi-volatile was detected

ASPHALT+ PREMIXED LAB TEST RESULTS

IKRAM PAVES Sdn Bhd

PAVEMENT LABORATORY

STANDARDS MALAYSIA

TESTING

SAMM No. : 762

Form : PL-F-LWI-09
Issue No. : 2
Rev. No. : 1
Eff. Date : 02.2022
Page No. : 6 of 6

Request No :				Equipment Used	
Temperature (°c)	27.3°C	Pressure:	73.4 mmHg	1 Balance No. 2	5
Project:				2 Oven No. 3c	6
				3 Thermometer No 2	7
				4 Water Bath No. 2	8

INTERNAL TESTING

TYPE OF MIX	CR - GGA	Mixing Temperature	180°C	LOCATION	LAB PAVES
AVA. SP. GR. AGG. BLEND (GAG)	2.603	Compacting Temperature	150°C → 5	DATE SAMPLED	29/08/23
SP. GR. BIT (GAC)	1.02	Test Temperature	60°C for 45 minutes	DATE TESTED	30/08/23
PEN. BR. BIT	60/70 + CRUMB RUBBER			SAMPLED NO.	3

MARSHALL STABILITY AND FLOW OF BITUMINUOS MIXTURES (ASTM:D 6927 - 15)

SAMPLE NO	% BIT. SPEC. NO.	SPEC. HGT. (mm)	WEIGHT gm In Air	WEIGHT gm SSD	WEIGHT gm In Water	BULK VOL. CC.	SPECIFIC GRAVITY Bulk	SPECIFIC GRAVITY Max. Theor.	VOLUME % TOTAL Bit	VOLUME % TOTAL Agg	VOLUME % TOTAL Voids	VOIDS % Agg.	VOIDS % Filled (Bit.)	VOIDS % Total Mix	CORR. FACTOR (mm)	STABILITY N Meas.	STABILITY N Corr.	FLOW (mm)	STIFFNESS N/mm
	6.00	64.28	1094.1	1098.6	610.4	488.2	2.241								0.98787	6673	6592.0	4.416	
		64.33	1083.3	1093.4	610.5	482.9	2.243								0.98710	7166	7073.5	4.494	
		64.22	1093.2	1102.4	612.5	489.9	2.231								0.98879	6848	6771.2	4.510	
				AVERAGE			2.239	2.381	13.17	80.84	5.99	19.16	68.73	5.99			6812.3	4.473	1523
				SPECIFICATION							4.5- 6.5	> 19 %					>5000	2 - 5	

REMARK : RUBBER CRUMB FROM SG. BULUH

Tested By	ABDUL MAJID	Verified By	NASIR
Signature		Signature	
Time	11.30 am	Time	3.30 pm
Date	30/08/23	Date	30/08/23

Pavement Laboratory Ikram Pavers Sdn. Bhd.

ASPHALT+ PREMIXED LAB TEST RESULTS

IKRAM PAVES SDN BHD

PAVEMENT LABORATORY

BINDER DRAIN DOWN (SCHELLENBERG METHOD)

Description Of Sample CR- GGA (RUBBER CRUMB (5.75) VESTANAMER (0.25) BITUMENT (60) AGGERAGATE (934)

Date Sample : 4/9/2023
Curing Temp : 170°C
Curing Time : 3 hours

		Sample 1	Sample 2	Sample 3	Sample 4
1	WEIGHT OF SAMPLE + CONTAINER BEFORE	1007.8			
2	WEIGHT OF SAMPLE CONTAINER, g	400.0			
3	WEIGHT OF SAMPLE WEIGHT OF SAMPLE, g	607.8			
4	WEIGHT OF SAMPLE + CONTAINER AFTER(after heated 170°),g	1006.4			
5	WEIGHT OF CONTAINER + RESIDUE AFTER	1.4			
6	WEIGHT OF BITUMEN IN CONTAINER				
7	LOSS (%)	0.14			
8	AVERAGE (< 0.2%)				

Project Title:	INTERNAL TESTING	Checked By:	MOHD NASIR BIN REBU Manager (Pavement Laboratory) IKRAM PAVES SDN. BHD.	QUALITY CONTROL LABORATORY
Tested By:	Abd Majid Md Akhir Technical Executive	Date	04/09/2023	

Pavement Laboratory
Ikram Paves Sdn. Bhd.

CONTACT US

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