

佳作

Honorable
Mention

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▶ 網路票選人氣獎第三名
3rd of internet vote

廢輪胎吸音制震墊

Recycled Tire Rubber Pad For Vibration And Acoustic Insulation

本團隊之產品創新及核心技術主要著重於橡膠廢棄物回收，台灣光汽車輪胎每年就會有產生高達12萬公噸的廢棄量，且無法再輕易的重新塑型或是被大自然所分解。透過本團隊將原料透過黏合及核心的加工製程技術，生產出具備多功能性的高值化產品，貼近你我生活。

公寓或社區大樓內上下樓鄰居發出的噪音問題，包括小孩子的哭鬧聲、爭吵、拉椅子，甚至是走路的聲音，都會導致生活品質大受影響，上下樓為此也會相互爭論，甚至是怒目相向。為解決問題，我們提供貼覆於地板的廢輪胎吸音制震墊，在加工製程上無產生二次汙染，且產品可自行簡易安裝，達到吸音、減震的功能，改善住家環境品質，增進工作的效率，共創和樂的社會氛圍。



The innovation and core technologies of our product are based on the use of recycled rubber waste. Taiwan generates approximately 120,000 metric tons of waste tires per year, and that can no longer be reshaped easily or decomposed by nature. Our team intends to develop high-value and versatility products close to everyone's daily life through a merit of binding crumb rubber and a critical processing skill.

The noise problems caused by neighbors in the apartment or community building, include the crying of children, quarrels, moving chairs, and even some walking sounds. The noise definitely affect the quality of life greatly. In order to solve these problems, we provide the Recycled Tire Rubber Pad attached to the floor for vibration and acoustic insulation. This innovation makes no secondary pollution in the manufacturing process, and the product can be installed easily by yourself to achieve the functions of vibration and acoustic insulation, which can improve the quality of our daily life, enhance the work efficiency, and create a harmonious atmosphere in our society.

廢輪胎吸音制震墊

Recycled Tire Rubber Pad for Vibration and Acoustic Insulation

本團隊之產品創新及核心技術主要著重於橡膠廢棄物回收，台灣光汽車輪胎每年產生高達12萬公噸的廢棄量，且無法再輕易重新塑型或是被大自然分解，透過本團隊將原料透過黏合及核心的加工製程技術，生產出具備多功能性的高價值產品貼近你我生活。

產品訴求



隔音、吸音



制震、減震



綠色、環保

細部圖說

第二層
廢輪胎隔音層

第三層
廢輪胎制震吸音層

第一層：木地板夾板

拼接卡扣，模組化設計



卡扣接合示意圖

應用範圍



地板鋪面

使用示意

使用廢輪胎吸音制震墊效果示意



本團隊將廢輪胎吸音制震墊貼覆於地板，可自行簡易安裝，達到吸音、制震的功能，改善住家環境。



廢棄輪胎

Scrap Rubber



每年丟棄

10億個

台北101
110樓



繞地球
88圈

這些無法自然分解的廢棄輪胎，風吹日曬下會釋放毒物污染土壤和地下水，堆積成為滋生病媒蚊蟲的溫床，易燃材質像不定時炸彈，傳統焚燒的回收方式則往往製造空氣污染和有毒戴奧辛，回收率也僅達35%。

永續製程

Sustainable Process



廢輪胎
製品回收



粉碎
加工處理



表面
處理技術



廢輪胎
吸音制震墊



外觀
設計



加工
成型技術

本團隊因應明年內政部規定上下樓層板隔音標準之政策且提倡政府3R理念，將廢棄輪胎經過核心技術再製成高價值產品，促進產業循環經濟的永續發展。

使用廢棄橡膠做為主原料，除了可省去額外回收處理的費用，在加工製程上亦不會對地球造成二次汙染。若產品成為汰舊品，還能回收做為原料再次使用，大幅增加在市場上的競爭力。

高值化產品

High-Valued Production



功能面

住宅噪音對人們的聽力、睡眠影響甚鉅，因此本團隊提供吸音、減震功能的地板橡膠墊可大幅改善居住生活品質。

設計面

提供各式花色、形狀設計，搭配簡易DIY拼裝方式，同時提升居家舒適空間。

需求面

根據Catalina Research研究統計，全球片材型塑膠地板銷售金額約為29億美金，且預估成長率為每年10%以上年複合成長率成長，由此得知國內外需求量極大。



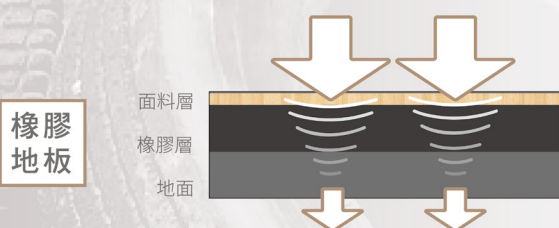
CONCEPT.

以回收、環保、再利用做為核心理念，將廢棄物循環利用再製成高價值產品，貼近你我生活，最終回饋地球。

循環經濟

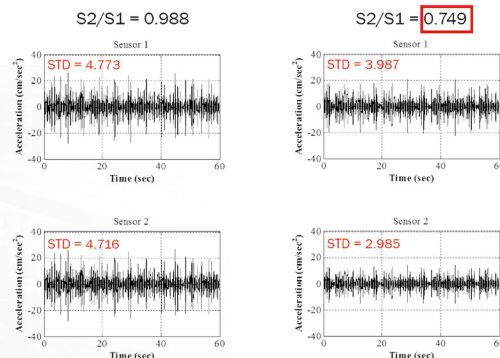


降噪減震



實驗數據

震動阻尼測試-微震動加速度規



衝擊音測試-根據CNS規範模擬縮尺模型

自製音箱-衝擊音測試									
設定	50-100dBA、球體落下高度：30公分								
球體材質	實心橡膠球（仿低頻噪音）								
球體重量	410公克								
名稱	1	2	3	4	5	平均值	標準差	差異度	
空白試驗	95.90	97.60	97.40	95.50	96.10	96.50	0.94		
廢輪胎吸音制震墊	67.90	68.70	68.40	68.50	67.70	68.24	0.42	28.26	
市售PVC地板	92.10	97.00	88.40	93.40	95.50	93.28	3.32	3.22	
自製音箱-衝擊音測試									
設定	50-100dBA、球體落下高度：30公分								
球體材質	鋼球（仿高頻噪音）								
球體重量	496公克								
名稱	1	2	3	4	5	平均值	標準差	差異度	
空白試驗	95.80	97.70	95.20	97.10	95.00	96.16	1.19		
廢輪胎吸音制震墊	70.60	66.60	68.00	70.40	68.90	68.90	1.68	27.26	
市售PVC地板	86.50	98.30	97.00	93.40	100.00	95.04	5.35	1.12	

Recycled Tire Rubber Pad for Vibration and Acoustic Insulation

The innovation and core technologies of our product are based on the use of recycled rubber waste. Taiwan generates approximately 120,000 metric tons of waste tires per year, and cannot be reshaped easily or decomposed by nature. We intend to develop high-value and versatile products close to everyone's daily life through the combination of crumb rubber and our central processing technique.

Function



Application



Assembled on the floor

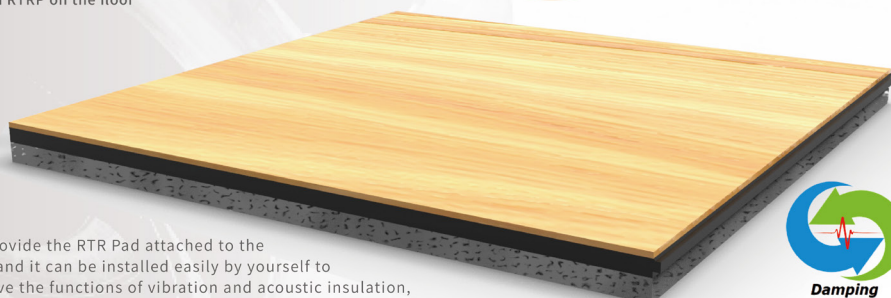
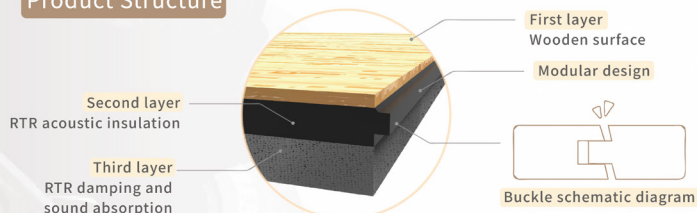
Product function diagram

With RTRP on the floor



We provide the RTR Pad attached to the floor and it can be installed easily by yourself to achieve the functions of vibration and acoustic insulation, which can improve the quality of our daily life.

Product Structure

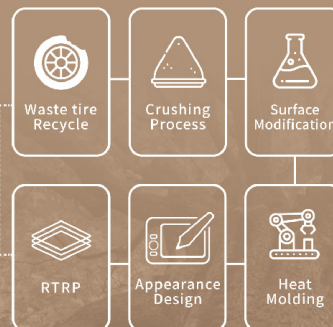


Waste Tire Rubber



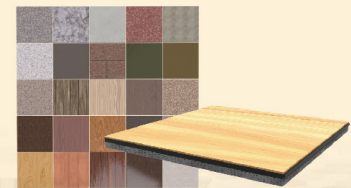
These invalidated tires, which cannot be decomposed naturally, will release toxic elements into the soil and groundwater when exposed to the sun. Moreover, if the tires are piled up, they will become the breeding ground for mosquitoes. Because they're flammable, these materials are just like untimed bombs. On the other hand, the traditional method of incineration often leads to air pollution and the produce of dioxin. Besides, the current recycling rate of disposed tires is no more than 35%.

Sustainable Process



Using disposed rubber as the product's raw material can not only cut off the additional cost of recycling, but can also prevent secondary pollution in recycling process. If the product is worn-out or needs to be replaced, the raw material can be reused. This advantage of the product can increase its competitiveness on the market.

High-Valued Production



Function

Residential noise has a great impact on people's hearing ability and sleeping quality. Therefore, to improve the living quality for the residents, our Recycled Tire Rubber Pad is designed to decrease vibration and increase acoustic insulation.

Design

The product comes with a variety of colors, shapes. Which can be simply assembled.

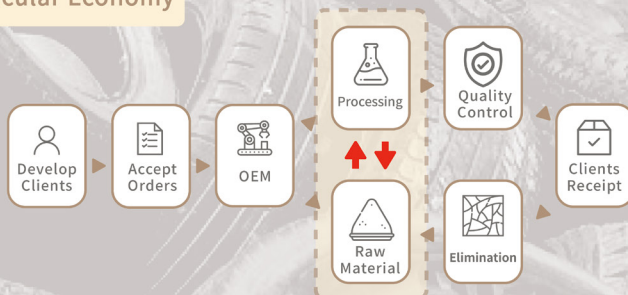
Demand

According to Catalina Research, the global sales of plastic flooring sheet is approximately 2.9 billion US dollars, and the estimated growth rate is above 10%. This shows that the global demand of the product is still extremely large.

CONCEPT.

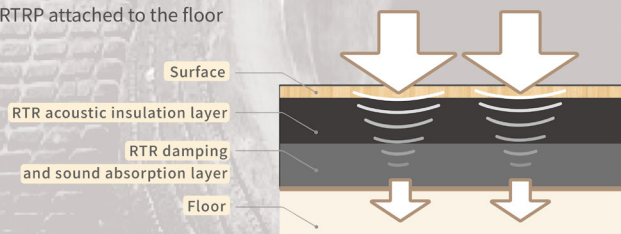
We follow the 3R(Recycle-Reduce and Reuse) concept advocated by the government in Taiwan and recycle waste to produce high-valued products, close to everyone's daily life. Ultimately, achieving the possibility of sustainable development.

Circular Economy



Vibration and Acoustic Insulation

RTRP attached to the floor

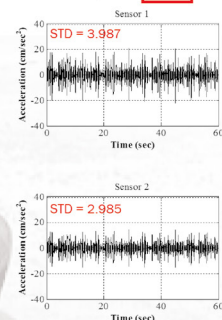
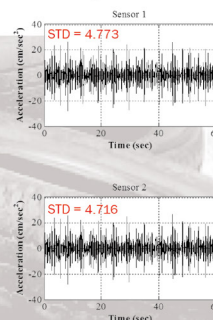


Experimental data

Vibration damping test-Use High Performance 1-Axis DC Accelerometer Modules

S2/S1 = 0.988

S2/S1 = 0.749



Floor impact sound test-Simulate the scale model according to the CNS specification

Hand made impact test box- floor impact sound test								
parameters	50~100dBA · Drop height: 30 centimeters							
Ball material	Solid rubber ball (low-frequency)							
Ball weight	410g							
number	1	2	3	4	5	AVG	STD	Difference
Non-RTRP test	95.90	97.60	97.40	95.50	96.10	96.50	0.94	
RTRP	67.90	68.70	68.40	68.50	67.70	68.24	0.42	28.26
Normal PVC flooring	92.10	97.00	88.40	93.40	95.50	93.28	3.32	3.22
Hand made impact test box- floor impact sound test								
parameters	50~100dBA · Drop height: 30 centimeters							
Ball material	Iron ball (high-frequency)							
Ball weight	496g							
number	1	2	3	4	5	AVG	STD	Difference
Non-RTRP test	95.80	97.70	95.20	97.10	95.00	96.16	1.19	
RTRP	70.60	66.60	68.00	70.40	68.90	68.90	1.68	27.26
Normal PVC flooring	86.50	98.30	97.00	93.40	100.00	95.04	5.35	1.12