



花岗岩四季冰壶

(冰板两用)



4-Season Granite Curling Stone

(For Both Real and Imitation Ice)



Inspiration from **Nature**

Aim at **Target** 

TIANO  **天奥冰壶**
Curling Stone

天奥花岗岩四季冰壶（冰板两用）

Tiano Granite 4-Season Curling Stone (On Both Real and Imitation Ice)

特征参数 / Feature and Specification:

上下两个工作面不同，一面是常规工作面，另一面带 3 个滚轮；
With 2 different working surfaces, one is regular for real ice, the other with 3 rollers for imitation ice



尺寸和重量符合世界冰壶联合会冰壶标准。
Size and weight conforms to WCF regular curling stone standard.



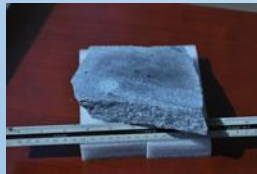
关于石材/ About the Granite

天奥冰壶研发团队深入分析研究了当今世界上制作冰壶球所采用的花岗岩，几乎跑遍了整个中国，采集了多种花岗岩，对其进行分析、试验和比较，最后在众多花岗岩石材中选定目前使用的花岗岩作为天奥冰壶原材料。

Tiano researchers searched lots of information about granite used for curling stone nowadays, travelled through almost the whole China, picked several kinds of granite, made tests and comparison, consulted to geologists, finally, we chose it to be Tiano Curling Stone material.



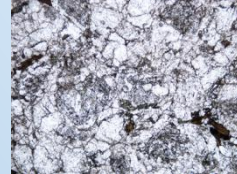
石材标本采集
Picked Natural Granite



吸水性试验
Property Research



可加工性试验
Machinability Research



显微镜下组织结构
Under microscope



最终选定石材
Finally Chosen

研发团队成员之一、瑞士联邦理工大学地质学博士仲歆对天奥花岗岩进行了科学鉴定，给出下述检测报告：

Xin Zhong, Doctor of Eidgenossische Technische Hochschule Zürich and one of Tiano research team, made scientific survey and presented the following report:

岩石镜下定名：花岗闪长岩

主要矿物：

斜长石含量 75+-% 莫氏硬度 6~6.5

石英含量 20+-% 莫氏硬度 7

黑云母含量 4+-% 莫氏硬度 2~2.5

微量矿物：磷灰石<1% 莫氏硬度 5

粒径：1.0mm~0.5mm

结构：细粒半自形粒状

裂缝及孔洞不发育 物性较好 受碰撞影响较小

Name under Microscope: Granodiorite

Rock Components:

Plagioclase: 75+-%, Mohs' scale of hardness 6~6.5;

Quartz: 20+-%, Mohs' scale of hardness 7

Biotite: 4+-%, Mohs' scale of hardness 2~2.5

Apatite and others: <1%, Mohs' scale of hardness 5

Grain Diameter: 1.0mm~0.5mm

Structure: Hypidiomorphic Fine Granular Texture

No pore and fracture development, that makes the rock a good collision and other physical characteristics

Microscopy Report

Tested Item: Tiano Granite
 Sample provided by: China Kaiyuan Tiano Automation Machinery Co. Ltd
 Name of Hand Specimen: Diorite
 Name under Microscope: Granodiorite

Rock Components		
Name	Content	Mohs' scale of hardness
Plagioclase	75+-%	6-6.5
Quartz	18+-%	7
Biotite	4+-%	2-2.5
Apatite	<1%	5
Others	<2%	

Grain Diameter: 1.0mm-0.5mm
 Structure: Hypidiomorphic Fine Granular Texture

Attached 2 images under microscope, from which, we can see no pore and fracture development, that makes the rock a good collision and other physical characteristics.

Tested by: Zhong Xin, Geology Doctor of Edgenossische Technische Hochschule Zürich

Signature: 仲欣

加工精度/ Machining Accuracy

天奥花岗岩四季冰壶使用计算机数控机床加工完成，以实现完美的一致性和匹配。

Tiano granite 4-season curling stones are manufactured with CNC machines for perfect consistence and matches.

天奥公司可以按客户要求定制任意尺寸重量、任何类型的花岗岩冰壶。

Tiano Company can customize granite curling stones of any type and any weight according to user's requirements.



天奥花岗岩四季冰壶具有如下精度等级
 Accuracy of Tiano Granite 4-Season Curling Stone

	一等壶 First Class	二等壶 Second Class
高度偏差 Height Deviation	±0.5mm	±1.5mm
直径偏差 Diameter Deviation	±0.5mm	±1.5mm
重量偏差 Weight Deviation	0.2kg	0.4kg
碰撞带高度偏差 Striking Band Height Deviation	±0.5mm	±1.5mm



● 弧线运动轨迹/ Curve and Curling

天奥花岗岩四季冰壶能够实现弧线球的投掷，下面图片是一个边区占位球的弧线实例

Tiano 4-season granite curling stone can perform curve and curling; the following show curve of a corner guard draw.



位置 1
Position1



位置 2
Position2



位置 3
Position3



位置 4
Position4



位置 5
Position5

● 天奥普及型仿冰赛道/ Tiano Imitation Curling Sheet for Curling Popularization



天奥普及型冰壶赛道具有无接缝、图案清晰、造价低廉且能实现弧线球的特点。

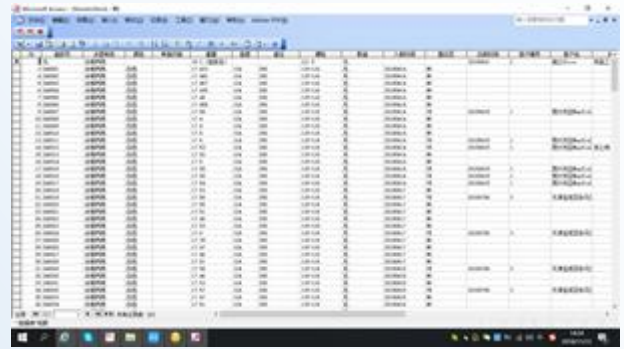
Tiano imitation curling sheet has no gap joint with clear house and other images on it. It costs less compared with other commercial imitation curling sheet. Also, curve and curling can be performed on the sheet.

● 出厂检测手段、产品可追溯/ Ex-work Test and Product Tracing System

尽管每只天奥花岗岩四季冰壶均采用同一加工程序由数控机床加工而成，但在出厂之前，还要对每只冰壶进行出厂测试。为避免人为因素导致的误判，天奥公司使用自制的发球器，用同等力量和角度对冰壶进行测试。



用发球器进行出厂测试/ Ex-work Test



产品追溯系统/ Product Tracing Database

天奥花岗岩四季冰壶质保 10 年，为此，天奥公司建立了自己的产品可追溯体系，以提供日后优质的产品服务。

Although all the Tiano granite 4-season curling stones are manufactured with the same CNC program using CNC machines, every stone is tested before delivery with self-made special tool in order to avoid wrong human evaluation. Using the testing tool, equal weight and angle are applied to every stone to get good consistence.

As Tiano provide 10 year guarantee, the company set up its own product tracing system for excellent after-sale services to the users.

关于天奥冰壶公司/ About Tiano Curling Stone Company

天奥冰壶公司由上市公司前研发总监、高级工程师王金义先生个人投资创办，建立起一支由机械设计工程师、高级技师、地质学家以及资深科技翻译组成的研发团队，成为国内首家集冰壶装备研发、生产、销售为一体的专业化冰壶装备制造商。

天奥冰壶公司于 2010 年开始花岗岩冰壶和桌上冰壶的研发，距今已满 8 个年头，先后完善了国际标准冰壶球、少年冰壶球、四季冰壶、非冰花岗岩冰壶和非冰塑料冰壶，拥有多项国家专利和技术诀窍；产品销往北京、天津、辽宁、吉林、黑龙江、青海、内蒙、新疆、香港、台湾等国内省市自治区，为国内冰雪体育增添了一抹亮丽的风景；产品还销往美国、澳大利亚、俄罗斯、新西兰、芬兰、乌克兰、挪威等国家。

公司目标

加强国际国内合作，生产世界顶级质量冰壶装备，推广环保冰壶的体育健身模式，为冰壶运动的推广普及做出贡献。

天奥冰壶公司使命

8 年来，公司先后利用多家知名互联网平台以及自媒体向大众普及冰壶运动知识，包括运动起源、基础知识、训练手册、制冰教程等。在 2022 北京冬奥会即将到来之际，天奥冰壶公司进一步明确了公司使命 – 助力北京冬奥会，为实现 3 亿中国人上冰雪的宏伟目标以及实现中国梦不懈奋斗。

The Company was wholly invested and founded by Mr. Wang Jinyi, a Senior Engineer and former R&D Director of a Chinese listed company. It possesses an experienced R&D team consisting of mechanical design engineer, senior technician, geology doctor from ETH Zürich and translation professional. Tiano is the first curling equipment manufacturer in China which integrates curling equipment R&D, production and sales.

The company started its granite curling stone and table curling R&D in 2010. During the more than 8 years, the company had developed Granite Regular Curling Stones, Granite Curling Stones for Teenagers, Four-season Synthetic Curling, Iceless Granite Curling Stone and Iceless Plastic Curling Stone with intellectual properties and know-how. The products had been used in Beijing, Tianjin, Liaoning, Jilin, Heilongjiang, Qinghai, Inner Mongolia, Xinjiang, Hong Kong, Taiwan and other provinces and Regions. They had also been delivered to the USA, Australia, New Zealand, Ukraine, Russia, Finland, Norway etc.

Tiano Target

Make Tiano curling equipment world top-notch by strengthening international and domestic cooperation, promote environment-friendly curling sport concept for curling popularization.

Tiano Mission

In the past 8 years, Tiano Company has been promoting curling knowledge to Chinese public via well-known internet platforms and we media, which include Curling Origin, Science in Curling, Basic Rule, Training Manual, Ice-making Course and etc.

With the coming of 2022 Beijing Winter Olympic, Tiano had made its mission clearer – Boost Beijing Winter Olympic, Contribute to the Great Ambition of *300 Million Chinese on Ice and Snow*, and Make our Chinese Dream Come True.



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