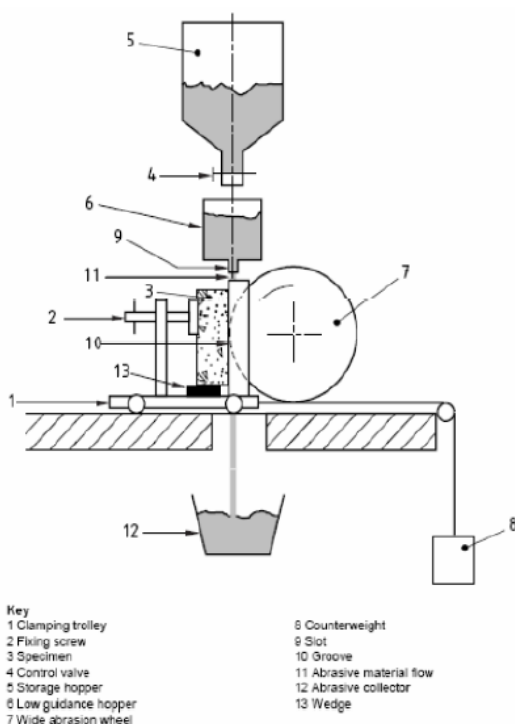


ABRASION RESISTANCE

Abrasion resistance represents the resistance of the stone's surface to wear, usually caused by pedestrian traffic, the wheels of trolleys and the legs of furniture. There are many different test methods available for evaluating abrasion resistance, the results of which are often not compatible with each other. In this paper see the follow abrasion test:

1. *Capon Test – standard EN 1341 and 1342; EN 14157*
2. *Taber Test – standard ASTM C1353*

TEST CAPON - Standard EN 1341 e 1342; EN 14157



The test is carried out by abrading the face of a sample, which will be exposed in use, with an abrasive material or wheel under standard conditions. The abrasion wear is determined as the width of the indentation caused in the sample.

Procedura : la macchina di abrasione è costituita da un disco d'acciaio (7), una tramoggia di alimentazione (5) con una valvola di controllo per regolare l'uscita del materiale abrasivo che alimenta una tramoggia a livello costante, un porta provini e un contrappeso che preme, con forza costante, il provino verso il disco ed il materiale abrasivo. L'abrasivo necessario è il corindone in polvere. Il disco effettua 75 giri in un minuto, trascinando la polvere di corindone che abrade il provino.

Risultati: il risultato della prova è una impronta rettangolare della quale si misura la sezione trasversale in mm corretta da un fattore di taratura e quindi arrotondato allo 0,5 mm più prossimo. Il fattore di taratura è dato dalla differenza aritmetica tra 20,0 mm e la misura della sezione trasversale dell'impronta su un materiale di riferimento, noto come marmo di Boulonnais.

Il risultato quindi viene espresso in mm:
Minore è il valore in mm e maggiore sarà la resistenza all'abrasione.



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REFERENCE: BRE - IP 10_00 FLOORING, PAVING AND SETTS REQUIREMENTS FOR SAFETY IN USE

(T J S Yates, PhD, and David Richardson, BSc, MSc, CGeol, FGS BRE Centre for Heritage, Stone and Masonry Structures)

ABRASION VALUE BY CAPON TEST MACHINE - STANDARD EN 14157

Class of use	Number of pedestrians	Number of journey across floor each day	Number of days per year	Service life expectancy without significant (years)	Approx total of number of pedestrian journeys	Abrasion value (mm)
Intensive (eg, airport shopping mall)	70,000 +	1	350 +	20	500,000,000	< 23 mm
Medium (eg office buikdings)	500	2	250	20	5,000,000	Between 23 and 30
Low (eg individual residence)	4	4	350 +	10	50,000	>30 mmm

CLASS OF USE INTENSIV: Less than 23 seems to be suitable for heavily trafficked areas. This is approximately equal to 500 million pedestrian journeys during the service life of the floor.

CLASS OF USE MEDIUM Between 23 and 30 is likely to be satisfactory for offices, etc (but not shops, stations etc). This is approximately equal to 5 million pedestrian journeys during the service life of the floor.

CLASS OF USE LOW Greater than 30 is probably restricted to houses or apartment blocks. This is approximately equal to 50,000 pedestrian journeys during the service life of the floor.

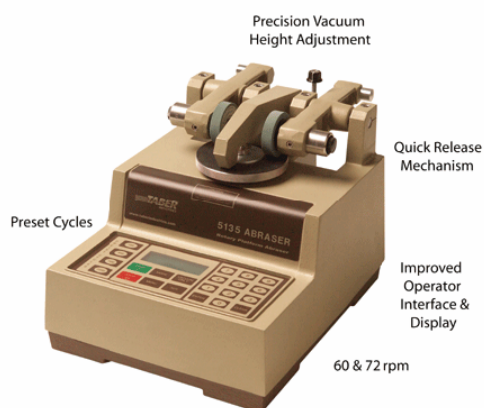
REFERENCE: I-STONE STANDARD TESTING METHODS

Re-engineering of natural stone production chain through knowledge based processes, eco-innovation and new organisational paradigms

ABRASION VALUE BY CAPON TEST MACHINE - STANDARD EN 14157

Class of Use	Example	Abrasion value (mm)
Intensive	- public halls in stations, airports, shopping centres; - halls in an apartment block with more than 30 housing units; - common rooms of an office building with more than 50 employees; - floorings in supermarkets, etc	≤ 24 mm
Moderate	- common rooms of multifamily houses (with max. 30 housing units); - common rooms of block offices (max. 50 employees); - rooms with moderate commercial use.	Between 24 mm and 35 mm
Individual	. all rooms in private housing units. note: in this category, the areas most susceptible to wear are the ones which are direct!) accessible from outside.	≤ 42 mm

TEST TABER ASTM C 1353



The ASTM C1353 method utilises the Taber abraser and standardised abrading wheels; it establishes a value of abrasion resistance by determining the loss of weight resulting from abrasion on flat specimens under controlled conditions.

The index of abrasion resistance (Ha) is calculated from the weight loss and the bulk density of the specimen.

It is a number, which is inversely proportional to the volume of the specimen removed during the test. The bulk density value used in the calculation is determined according the ASTM C97 method.

The higher the Taber index, the more resistant the stone is to abrasion.



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REFERENCE: SEMINAR: STONE IN MODERN BUILDING – PAVING

David West

ABRASION VALUE BY TABER TEST MACHINE - STANDARD ASTM C 1353

Taber abrasion index	Appropriate uses
> 20-25	All uses; high abrasion resistance
15 - 20	Moderately high abrasion resistance; suitable for most uses, including high traffic prestige commercial flooring
12 - 15	Moderate abrasion resistance; suitable for all but high traffic prestige commercial flooring
8 - 12	Moderately low abrasion resistance; suitable only for light commercial or domestic flooring situations
< 8	Low abrasion resistance; suitable only for domestic or light external traffic situation

REFERENCE: CSIRO - SELECTIVE GUIDE TO THE SPECIFICATION OF DIMENSION STONE

AH Spry

ABRASION VALUE BY TABER TEST MACHINE - STANDARD ASTM C 1353

Proposed used	Minimum Taber index value
Light duty, domestic	8
Medium duty, light commercial	12
Heavy duty	15