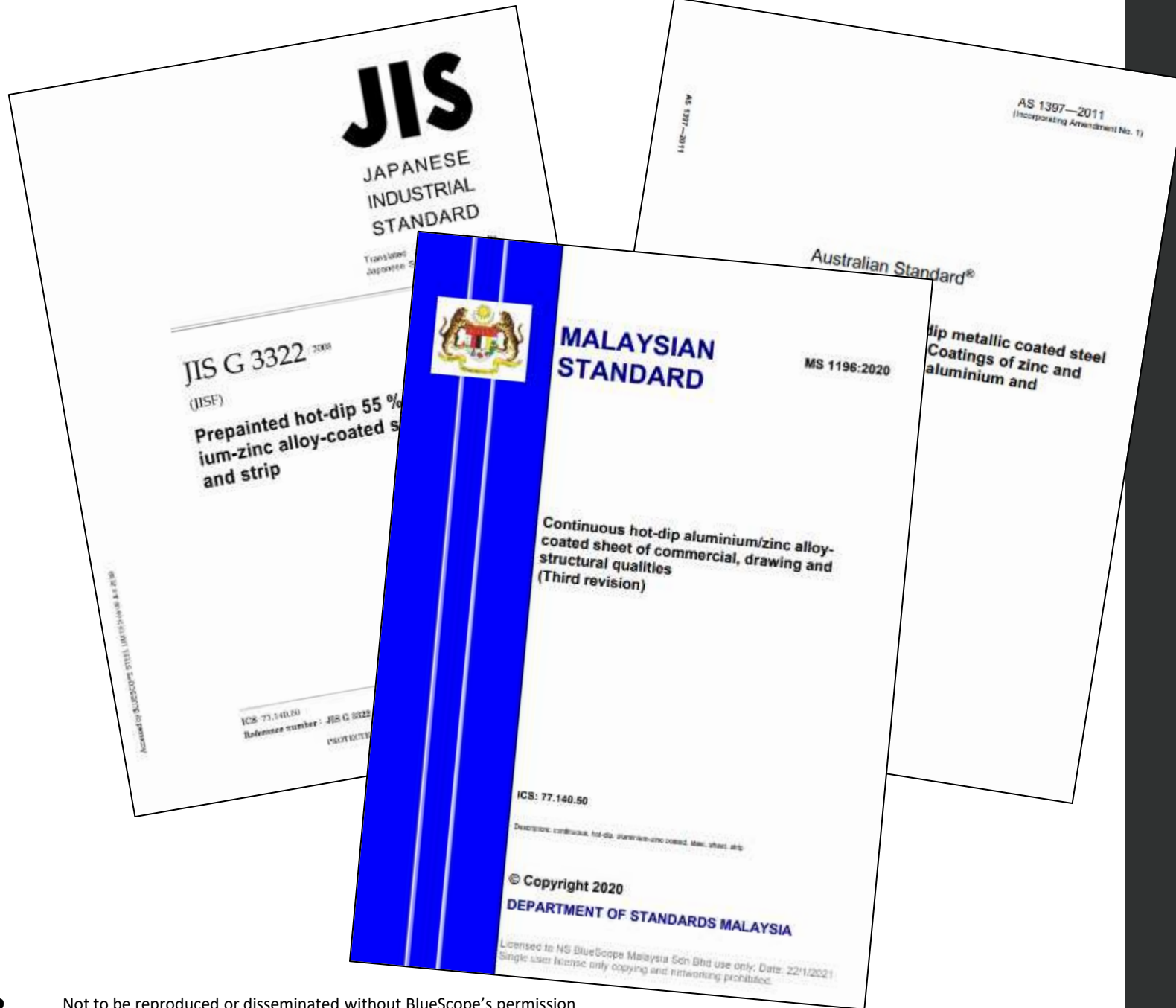




WHAT EXACTLY ARE STANDARDS AND CERTIFICATIONS? AND WHY DOES IT MATTER?



1

WHAT ARE STANDARDS

① WHAT ARE STANDARDS

**A FORM OF
GUIDELINE**

Standards Governing Body



Mission:
To provide **CREDIBLE STANDARDISATION** and **ACCREDITATION SERVICES** to facilitate international trade, develop industry competitiveness towards enhance economic growth, societal and environmental well-being.

1 WHAT ARE STANDARDS

OWNER OF MALAYSIAN STANDARDS

1 WHAT ARE STANDARDS

Certification Body
recognition/usage of the
specific Standards Documents



Mission:

To provide innovative solutions through **TESTING, INSPECTION** and **CERTIFICATION SERVICES** for our customers to be globally competitive.

USER OF STANDARDS

STANDARDS
MALAYSIA

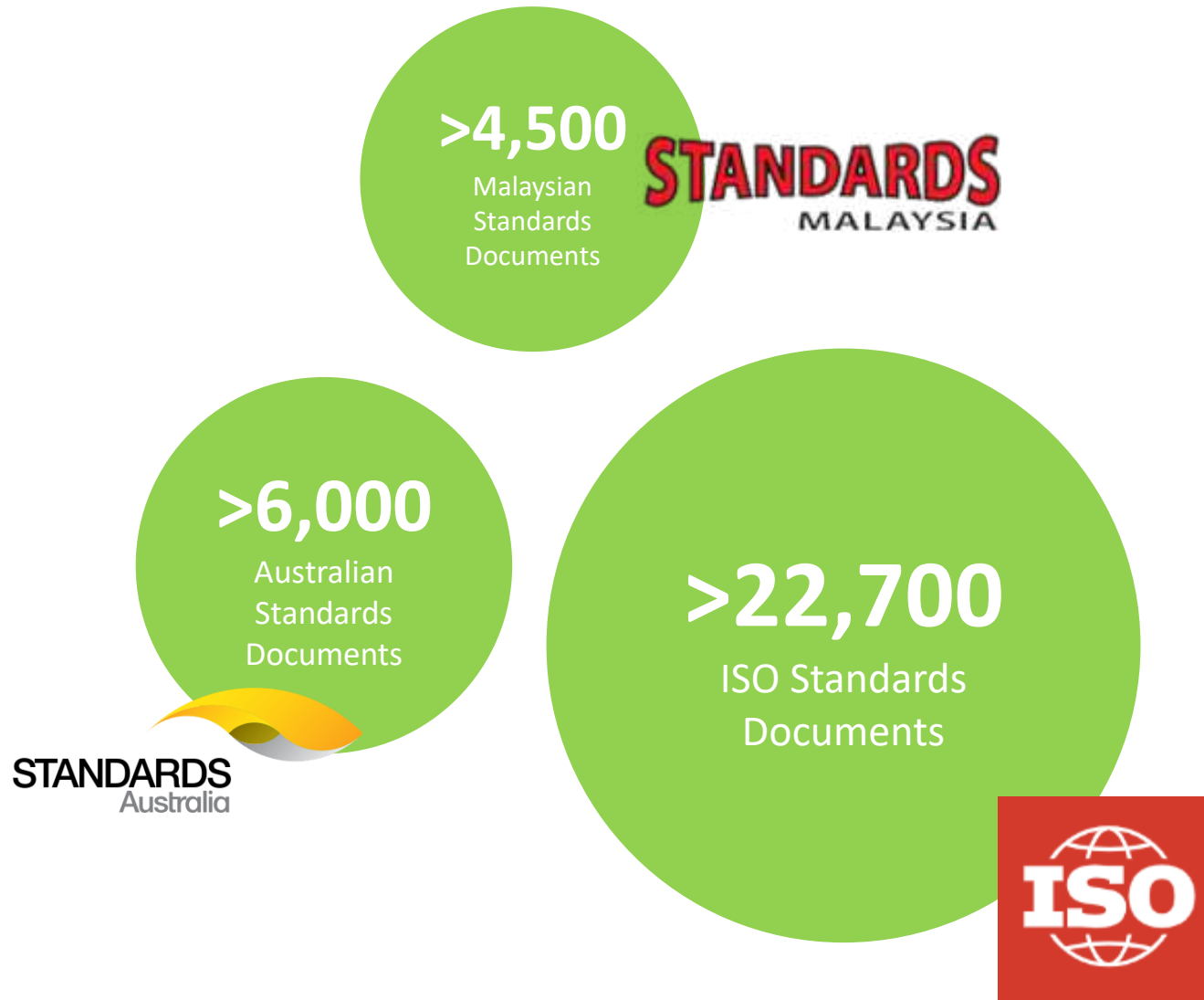


ACCREDITED by
government agency to be
able to provide
Certification/Testing
Services

Products/Process
CERTIFIED by an
Accredited Certification
Body

ACCREDITATION VS CERTIFICATION OVERVIEW

1 WHAT ARE STANDARDS



**BASED ON
RELEVANT
PUBLISHED
STANDARDS**

1 WHAT ARE STANDARDS



MALAYSIAN STANDARD DOCUMENTS

MS 2651



MS 1196



MS 2383



MS 2500



1 WHAT ARE STANDARDS

**STANDARDS
FOR
DIFFERENT
STAGES OF A
CLADDING
PRODUCT**

Contents

	Page
Committee representation	ii
Foreword.....	iv
Committee representation	ii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Product corrosivity category	3
5 Performance requirements for prefinished flat steel products.....	6
6 Marking.....	11
Annex A Purchasing guidelines.....	13
Annex B Atmospheric environment.....	15
Annex C Reverse impact test.....	16
Annex D T-bend adhesion test.....	18
Annex E Storage and handling of products.....	20
Annex F Summary of testing	21

1 WHAT ARE STANDARDS

**LOOK FOR
THE SCOPE OF
EACH
STANDARD**

MS 2383:2020

Prefinished flat steel products for interior/exterior building applications - Performance requirements (First revision)

1 Scope

This Malaysian Standard specifies performance requirements for continuously organic coated/laminated flat steel product and that are intended for fabrication into products for use in the construction or finishing of buildings.

This standard classifies prefinished flat steel products into six types according to their performance, in respect to durability and aesthetics, in environments of varying severity.

NOTES:

1. Advice and recommendations on information to be supplied by the purchaser at the time of enquiry or order are contained in the purchasing guidelines set out in Annex A.
2. The performance of a coating will be dependent on the corrosion resistance of the substrate in the particular environment and on climatic influences that directly affect the coating. Such influences include solar radiation and the presence of water vapour (see Annex B).

LOOK FOR
THE SCOPE OF
EACH
STANDARD



2

QUALITY TESTS OF DIFFERENT STANDARDS

AS 1397

ASTM A792

JIS G 3321

MS 1196



② QUALITY TESTS OF DIFFERENT STANDARDS

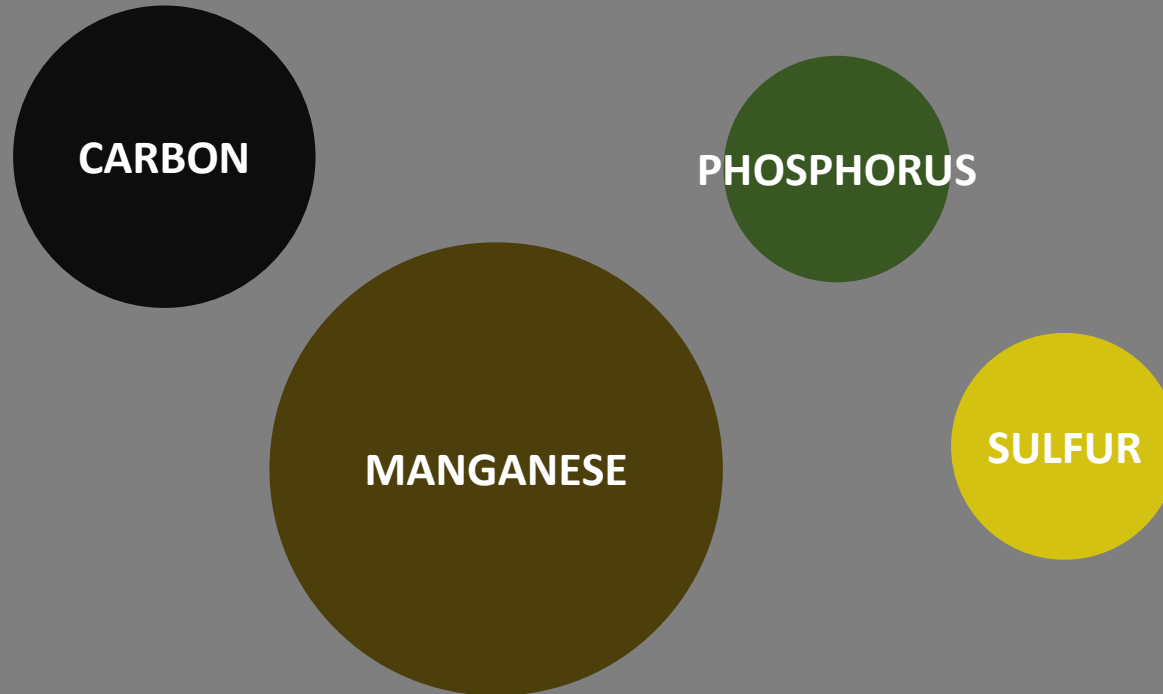
DIFFERENT NATIONAL STANDARDS FOR METALLIC COATED STEEL (TYPE AZ)

2 QUALITY TESTS OF DIFFERENT STANDARDS

List of Tests	AS 1397	ASTM A792	JIS G 3321	MS 1196
Quality Test				
Chemical Composition	Yes	Yes	Yes	Yes
Tensile Test	Yes	Yes	Yes	Yes
Bend Test (Adhesion)	Yes	Yes	Yes	Yes
Dimensional Tolerances	Yes	Yes	Yes	Yes
Coating Mass	Yes	Yes	Yes	Yes

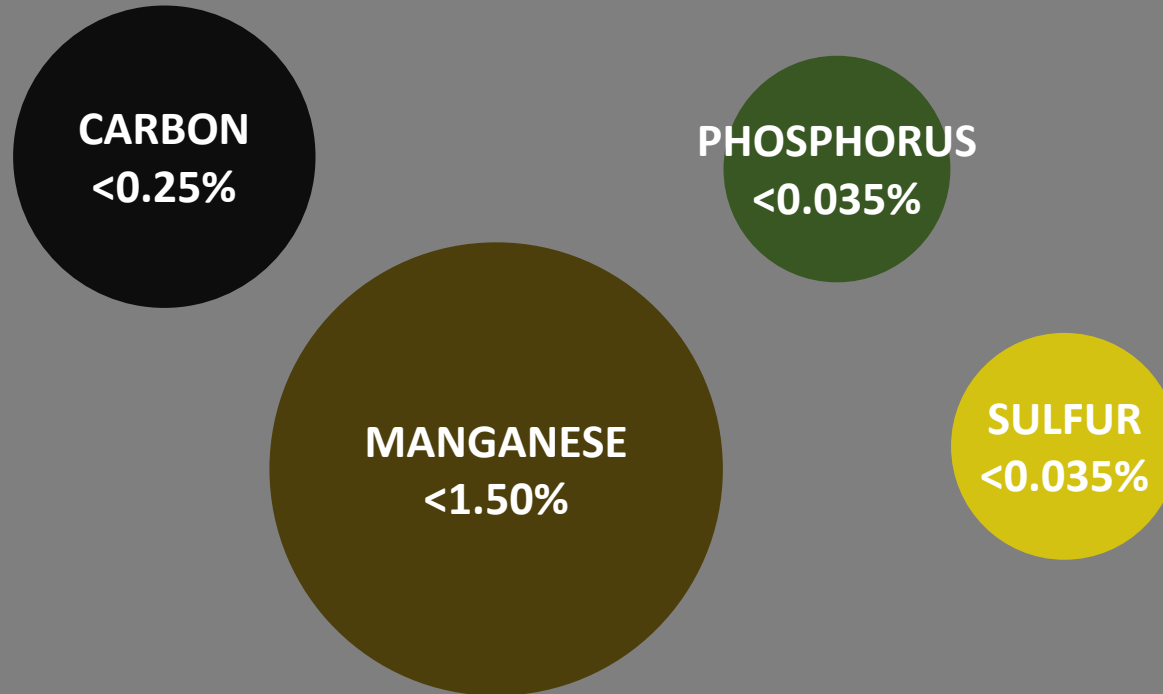
TESTING SCOPES FOR METALLIC COATED STEEL (TYPE AZ)

STEEL



CHEMICAL COMPOSITION

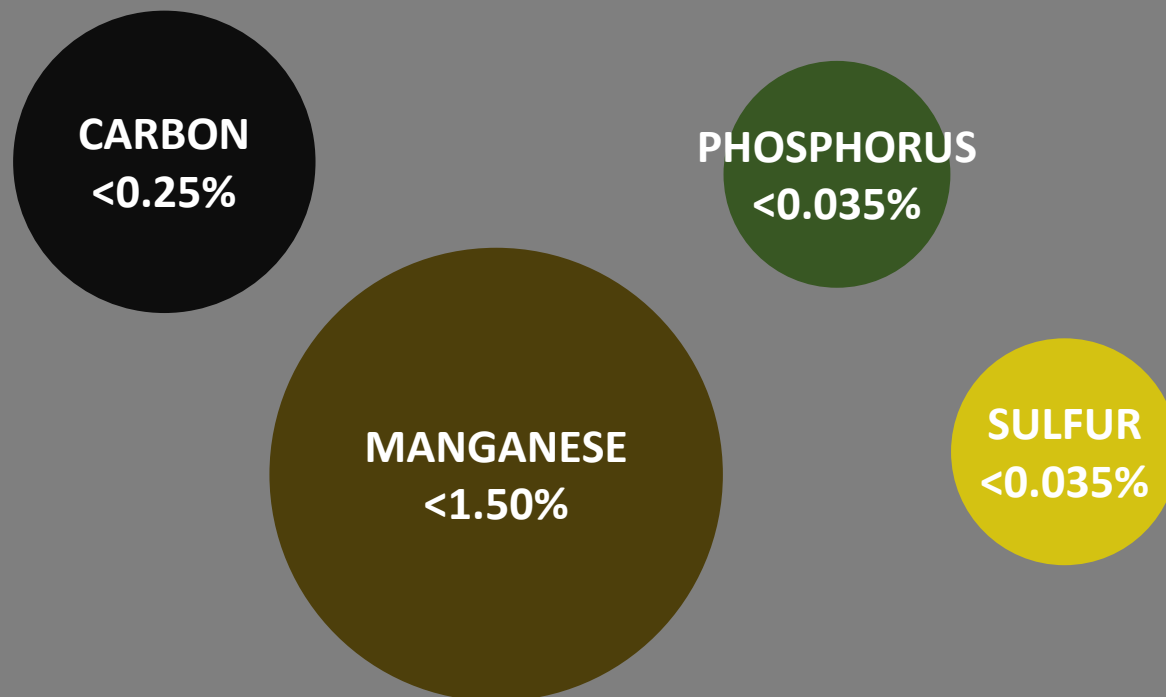
STEEL (STRUCTURAL GRADE)



CHEMICAL COMPOSITION (MS 1196)

STEEL (STRUCTURAL GRADE)

2 QUALITY TESTS OF DIFFERENT STANDARDS

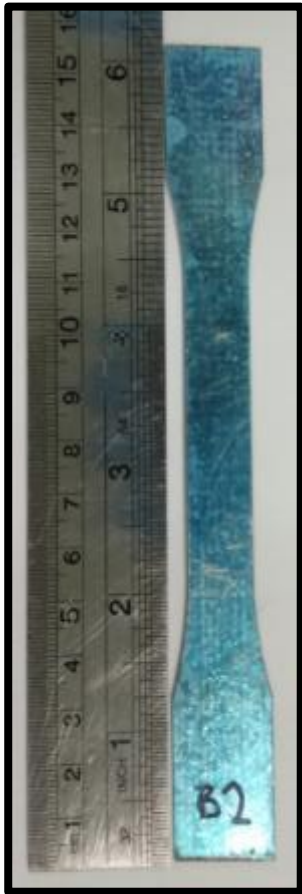


CHEMICAL COMPOSITION REQUIREMENTS

Max. Chemical Composition %	AS 1397	ASTM A792	JIS G 3321	MS 1196
Carbon, C	0.20	0.20	0.30	0.25
Manganese, Mn	1.20	1.35	2.50	1.50
Phosphorus, P	0.04	0.04	0.20	0.035
Sulfur, S	0.03	0.04	0.05	0.035

② QUALITY TESTS OF DIFFERENT STANDARDS

TENSILE TEST MACHINE





② QUALITY TESTS OF DIFFERENT STANDARDS

“DOG BONE” SAMPLE



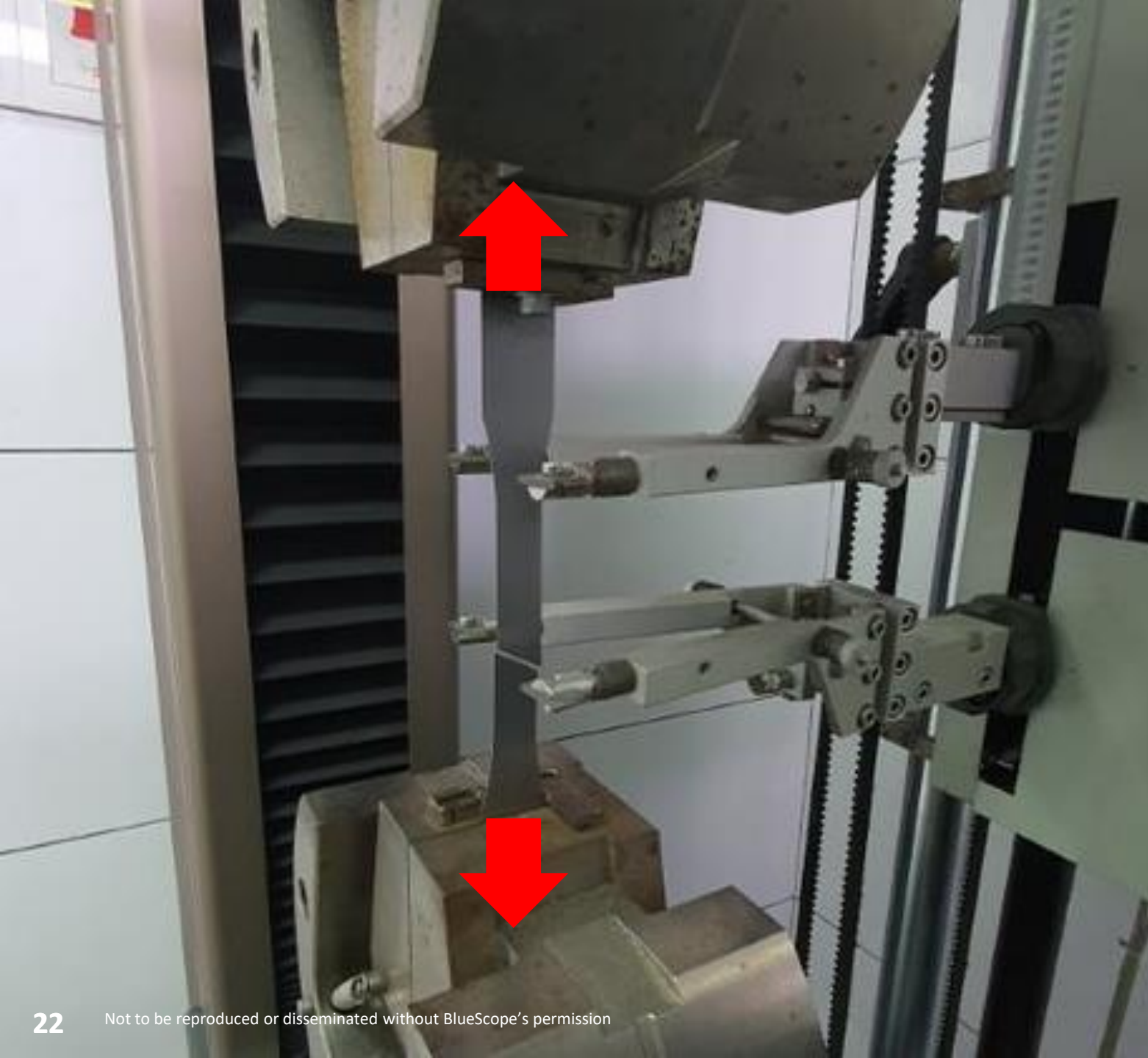
② QUALITY TESTS OF DIFFERENT STANDARDS

PLACED ONTO THE MACHINE



② QUALITY TESTS OF DIFFERENT STANDARDS

**PLACED
ONTO THE
MACHINE**



② QUALITY TESTS OF DIFFERENT STANDARDS

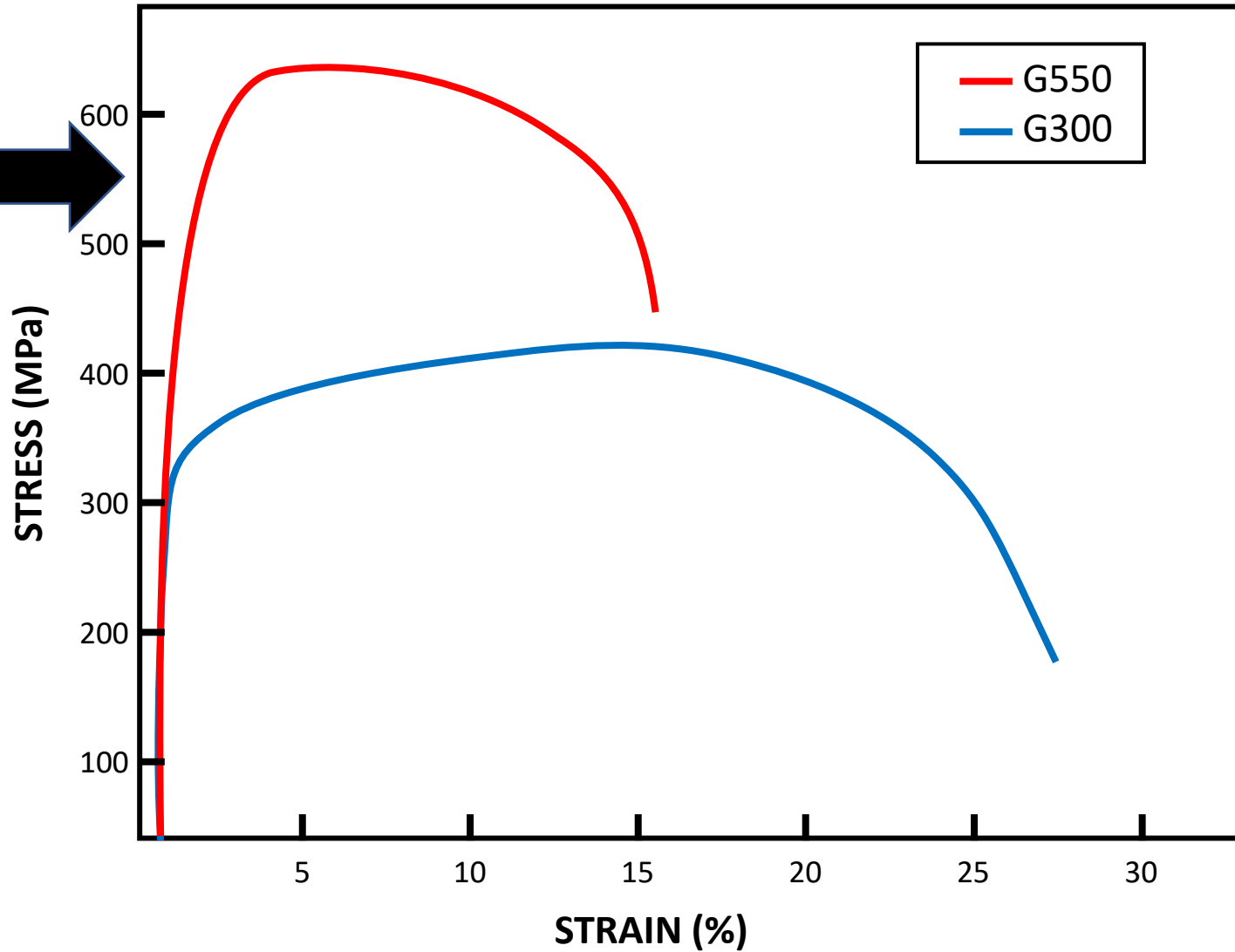
**MACHINE
WILL PULL THE
SAMPLE**

② QUALITY TESTS OF DIFFERENT STANDARDS

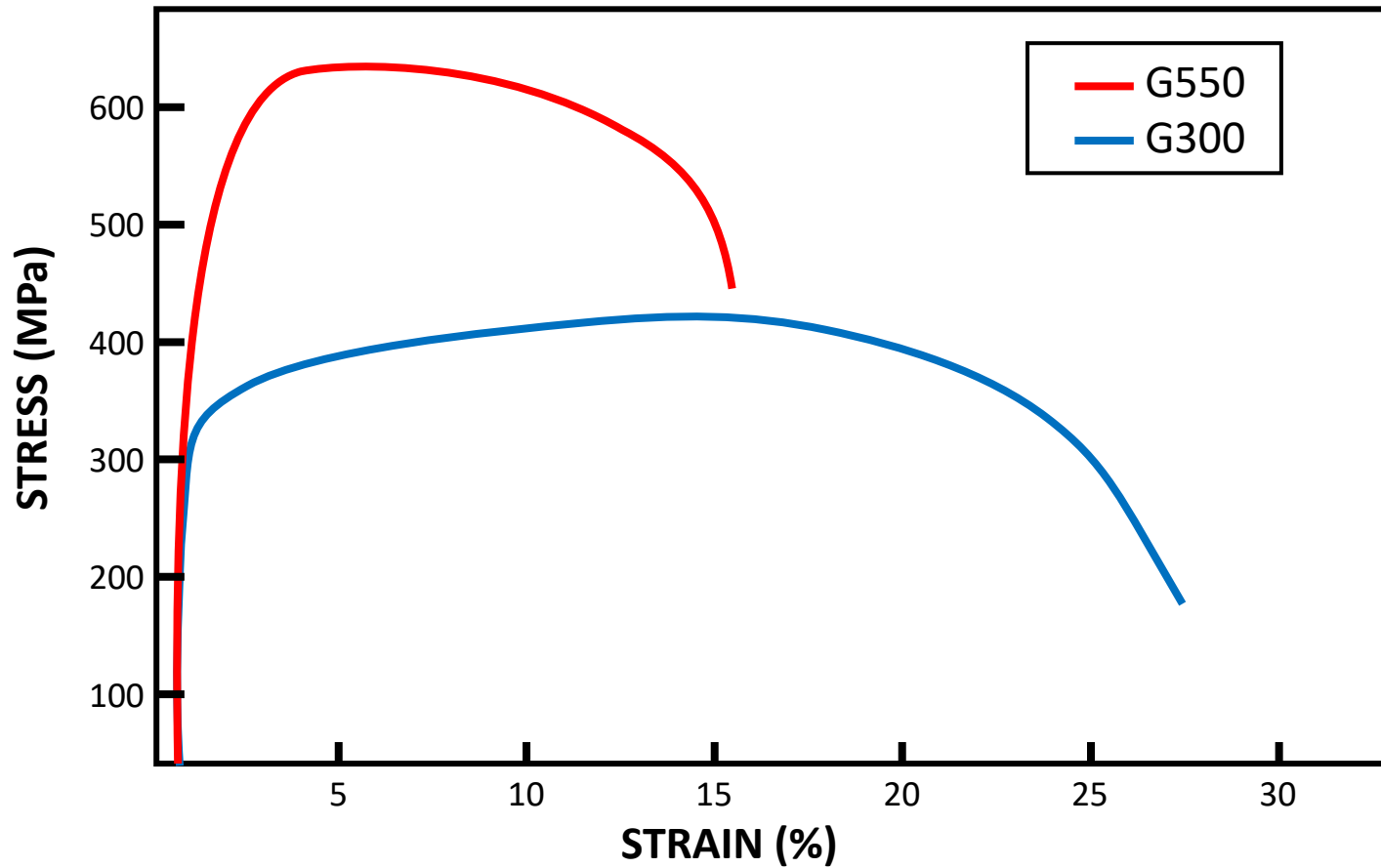
**SAMPLE IS
PULLED UNTIL
IT FAILS**



STRESS-STRAIN CURVE



2 QUALITY TESTS OF DIFFERENT STANDARDS

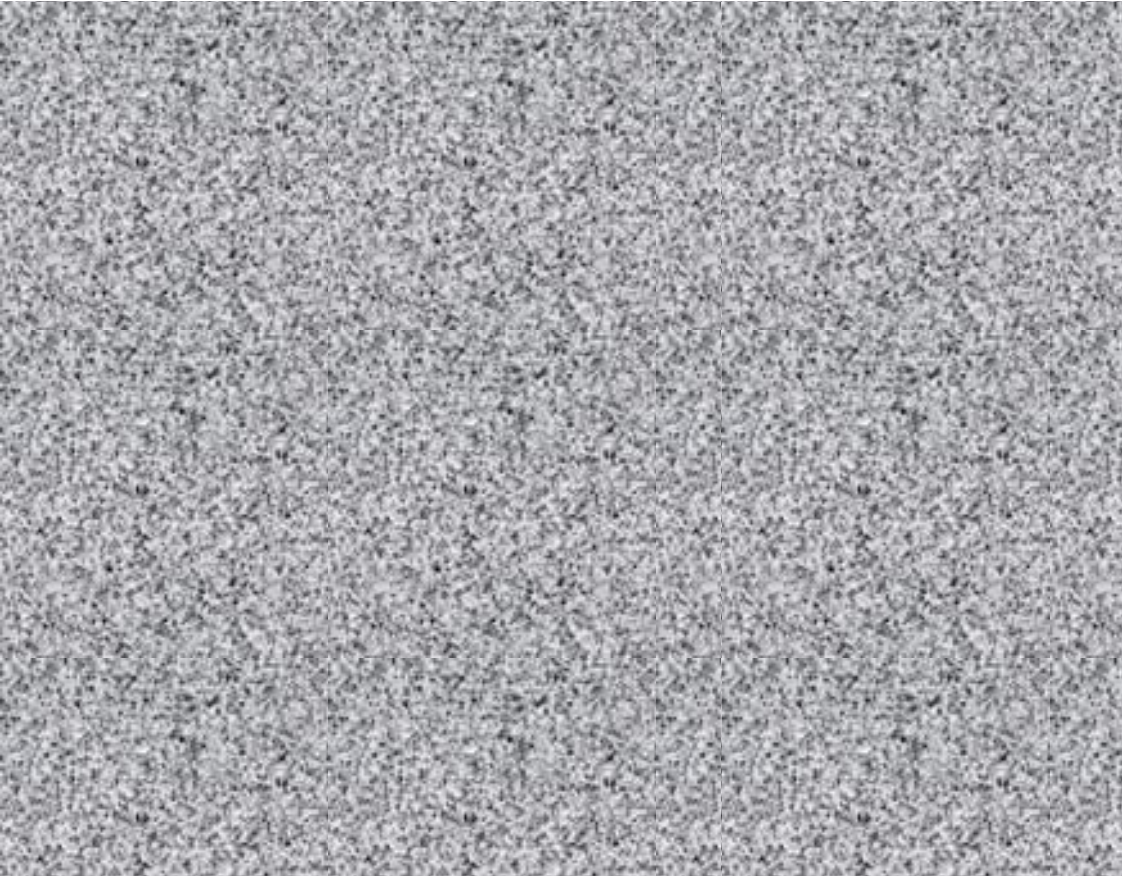


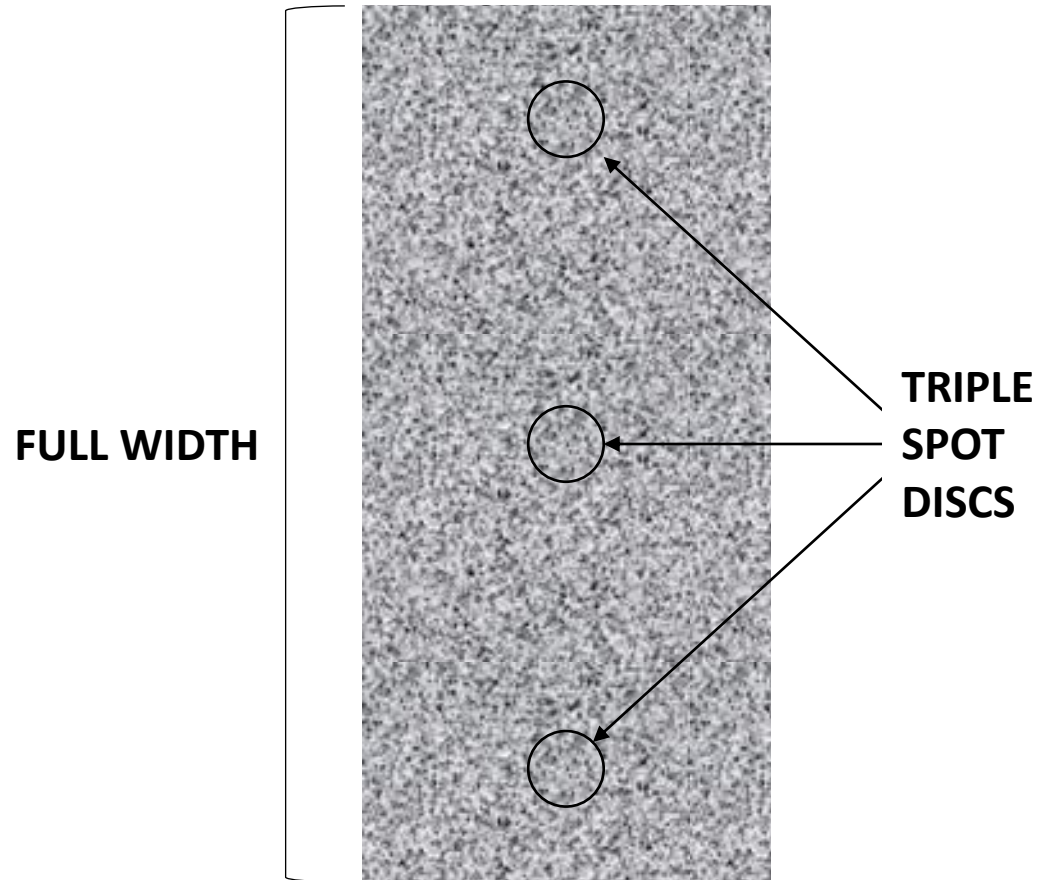
TENSILE TEST REQUIREMENTS

Example: G550	AS 1397	ASTM A792	JIS G 3321	MS 1196
Yield Strength	>550MPa	>550MPa	>560MPa	>550MPa
Tensile Strength	>550MPa	>570MPa	>570MPa	>570MPa
Elongation	2*	-	-	-

② QUALITY TESTS OF DIFFERENT STANDARDS

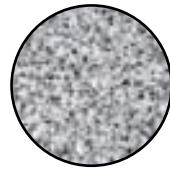
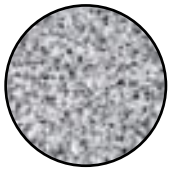
COATING MASS TEST





FULL WIDTH SAMPLE

② QUALITY TESTS OF DIFFERENT STANDARDS

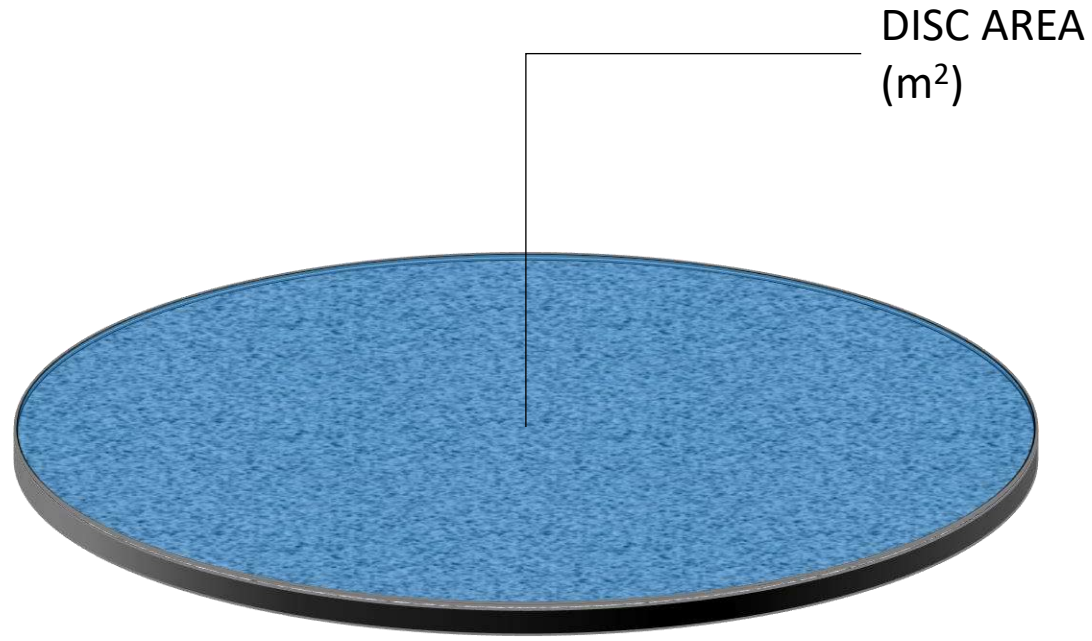


**3 DISCS
SAMPLED**

② QUALITY TESTS OF DIFFERENT STANDARDS



**3 DISCS
SAMPLED**



MEASURE OF DISC AREA

② QUALITY TESTS OF DIFFERENT STANDARDS



**BOTH SIDES
METALLIC
COATING
REMOVED**



COATING MASS RANGE

	AS 1397	ASTM A792	JIS G 3321	MS 1196
Coating Mass Range	AZ150 & AZ200	AZ100 AZ110 AZ120 AZ150 AZ165 AZ180 AZ210	AZ70 AZ90 AZ120 AZ150 AZ170 AZ185 AZ200	AZ50 AZ70 AZ90 AZ100 AZ120 AZ150 AZ165 AZ185 AZ200

2 QUALITY TESTS OF DIFFERENT STANDARDS



COATING MASS RANGE

	AS 1397	ASTM A792	JIS G 3321	MS 1196
Coating Mass Range	AZ150 & AZ200	AZ100 ⋮ AZ210	AZ70 ⋮ AZ200	AZ50 ⋮ AZ200

2 QUALITY TESTS OF DIFFERENT STANDARDS

AS/NZS 2728

ASTM A755

JIS G 3322

MS 2383



**DIFFERENT
NATIONAL
STANDARDS
FOR
PREPAINTED
COATED STEEL**

2 QUALITY TESTS OF DIFFERENT STANDARDS

List of Tests	AS/NZS 2728	ASTM A755	JIS G 3322	MS 2383
Quality Test				
Appearance (Gloss, Colour)	Yes	Yes	Yes	Yes
Dry Film Thickness	Yes	Yes	Yes	Yes
Paint Adhesion	Yes	Yes	Yes	Yes
Scratch Resistance	Yes	Yes	Yes	Yes

TESTING SCOPES FOR PREPAINTED COATED STEEL



③

PERFORMANCE TESTS OF DIFFERENT STANDARDS

List of Tests	AS/NZS 2728	ASTM A755	JIS G 3322	MS 2383
Performance Test				
Humidity Resistance	Yes	Optional	Yes	Yes
Paint Durability	Yes	Optional	-	-
Corrosion Resistance	Yes	Optional	Yes	Yes

1 Scope

This Malaysian Standard specifies performance requirements for continuously organic coated/laminated flat steel product and that are intended for fabrication into products for use in the construction or finishing of buildings.

This standard classifies prefinished flat steel products into six types according to their performance, in respect to durability and aesthetics, in environments of varying severity.

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2. The performance of a coating will be dependent on the corrosion resistance of the substrate in the particular environment and on climatic influences that directly affect the coating. Such influences include solar radiation and the presence of water vapour (see Annex B).

PAINT DURABILITY TEST



3 PERFORMANCE TESTS OF
DIFFERENT STANDARDS

**TO DETERMINE
PAINT
LASTINGNESS**

TAKEN IN 2009



TAKEN IN 2020



③ PERFORMANCE TESTS OF
DIFFERENT STANDARDS

TO ACHIEVE
CONSISTENT
BUILDING
APPEARANCE
OVER TIME

3 PERFORMANCE TESTS OF
DIFFERENT STANDARDS

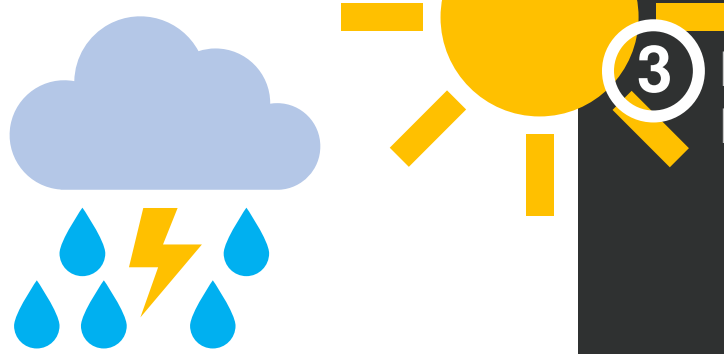
PAINT COATING

METALLIC COATING

STEEL

**PREPAINTED
COATED STEEL
CROSS
SECTIONAL
VIEW**

YEAR 20



3

PERFORMANCE TESTS OF
DIFFERENT STANDARDS



**PAINT
EROSION**

PAINT COATING

METALLIC COATING

STEEL

**PAINT
EROSION**

List of Tests	AS/NZS 2728	ASTM A755	JIS G 3322	MS 2383
Performance Test				
Humidity Resistance	Yes	Optional	Yes	Yes
Paint Durability	Outdoor Exposure	Optional	-	-
Corrosion Resistance	Yes	Optional	Yes	Yes

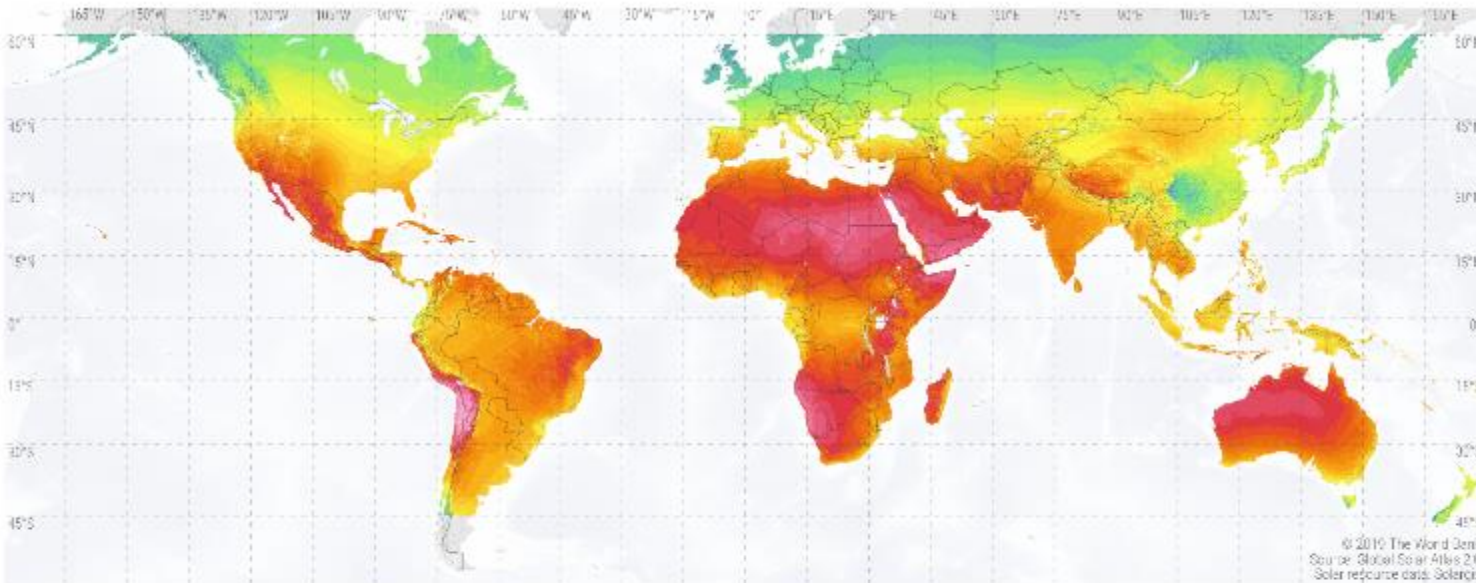
3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

OUTDOOR EXPOSURE TEST



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

UV IRRADIATION INTENSITY



Long-term average of global horizontal irradiation (GHI)

Daily totals:	2.2	2.6	3.0	3.4	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4
Yearly totals:	803	949	1095	1241	1387	1534	1680	1826	1972	2118	2264	2410	2556	2702

kWh/m²

This map is published by the World Bank Group, funded by ESMAP, and prepared by Solargis. For more information and terms of use, please visit <http://globalsolaratlas.info>



③ PERFORMANCE TESTS OF DIFFERENT STANDARDS

OUTDOOR EXPOSURE (SEVERE UV SITE)



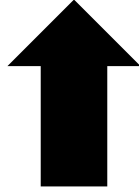
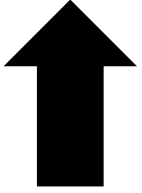
3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

OUTDOOR EXPOSURE (TROPICAL SITE)

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

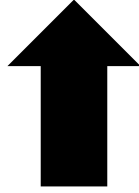
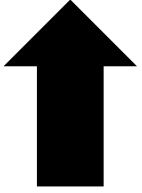
YEARLY INSPECTIONS

③ PERFORMANCE TESTS OF DIFFERENT STANDARDS



**SAME
COLOUR,
DIFFERENT
FADING RATE**

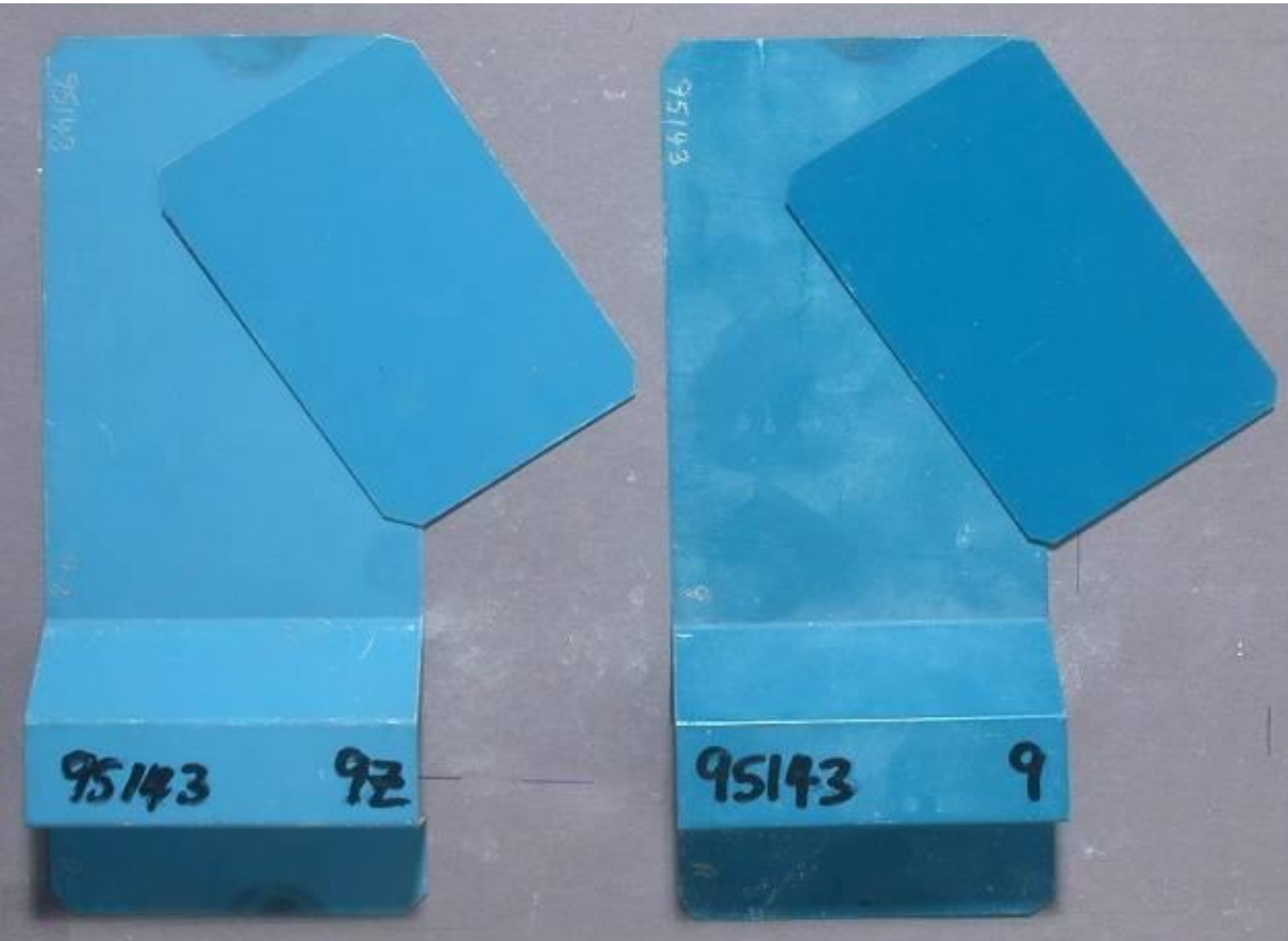
③ PERFORMANCE TESTS OF DIFFERENT STANDARDS



**SAME
COLOUR,
DIFFERENT
FADING RATE**

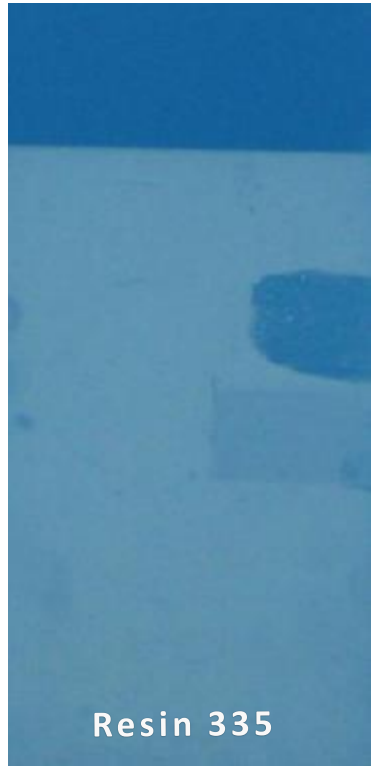
③ PERFORMANCE TESTS OF
DIFFERENT STANDARDS

**MORE
INTENSE
COLOUR IS
NOT ALWAYS
BETTER**



③ PERFORMANCE TESTS OF
DIFFERENT STANDARDS

RESINS AND
PIGMENTS
SELECTION
PLAY
CRUCIAL
ROLES



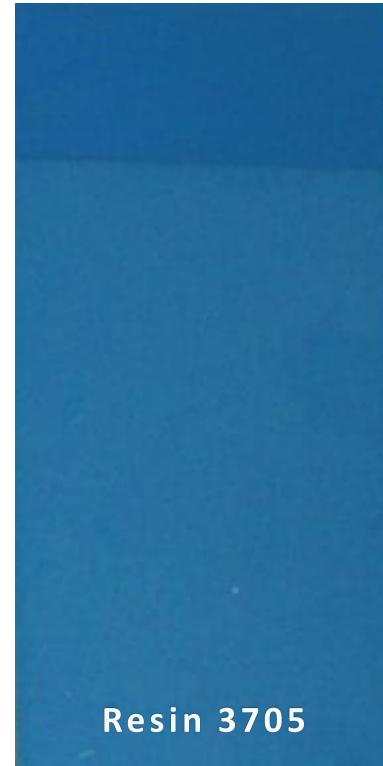
Resin 335

$\Delta E \sim 20.7$



Resin 305

$\Delta E \sim 16.3$



Resin 3705

$\Delta E \sim 7.4$

List of Tests	AS/NZS 2728	ASTM A755	JIS G 3322	MS 2383
Performance Test				
Humidity Resistance	Yes	Optional	Yes	Yes
Paint Durability	Yes	Optional	-	-
Corrosion Resistance	SST & CCT	Optional	SST / CCT	SST / CCT

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CORROSION RESISTANCE TEST

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

SEA SPRAY



Figure 1. Classified of IDW Chloride Map



Figure 2. Classified of IDW Nitrate Map



Figure 3. Classified of IDW Sulphate Map



Figure 4. Classified of IDW Rainfall Map



Figure 5. Local Classified IDW time of wetness map for Peninsular Malaysia

MALAYSIA CORROSION MAPPING

MALAYSIA CORROSION MAPPING



Figure 6. Corrosion Risk Map Peninsular Malaysia based on 10 Year of Data

③ PERFORMANCE TESTS OF DIFFERENT STANDARDS

AUSTRALIA CORROSION MAPPING

10KM
FROM
COASTLINE

1KM
FROM
COASTLINE

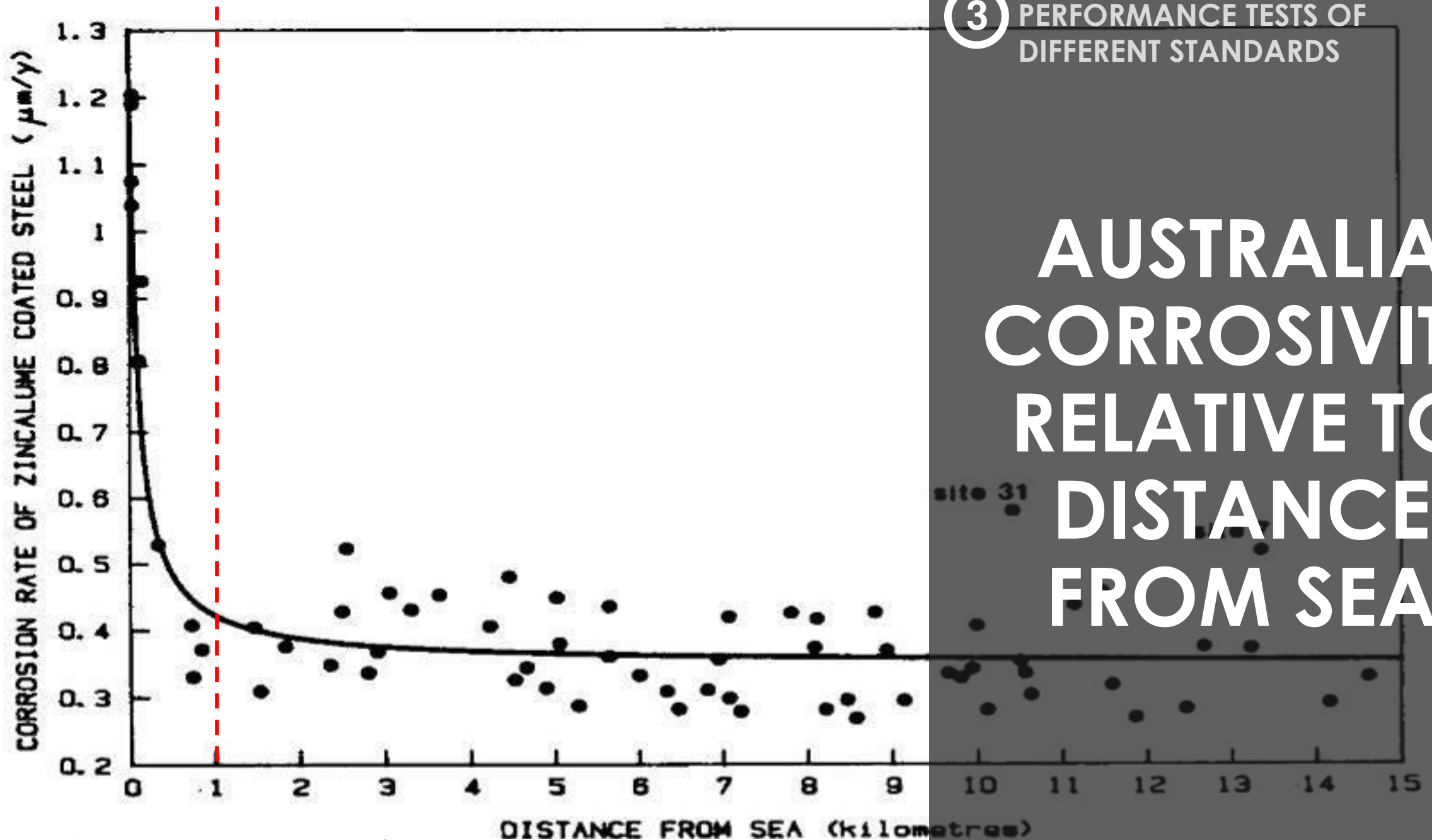
TABLE J2
CHARACTERIZATION OF AUSTRALIAN CORROSION TEST SITES

Criteria	Owner/Site				
	BlueScope Steel			CSIRO	Belmont (Beach) NSW
	Bellambi Point	Shellharbour	Port Kembla	Flinders marine site	
Rating as to ISO 9223	C4	C3	C5	C4	C5
Latitude/longitude	34.6/150.8	34.6/150.8	34.5/150.9	38.29/145.2	32.0/152.4
Orientation	—	—		N	Any
Distance to sea, km	0.05	0.3	0.05	0.1	0.2
Direction of prevailing winds	NE/S	NE/SE	NE/SE	W	
Degree of industrialization	Nil	Nil	Low	Nil	Nil
Average annual rainfall, mm	1580	1580	1277	750	1142
Annual mean temperature—					
—at 9 a.m., °C	17	17	17.6	14	16.7
—at 3 p.m., °C	19	19	19.4	16	19.8
—overall, °C	17	17		15	
Solar radiation, mWh/cm ²	460	460		430	480
Average humidity—					
—winter, %	—	—		—	
—summer, %	—	—		—	
—annual, %	62 to 67	60 to 67		67	65
Time of wetness—annual (number of hours the relative humidity exceeds 80%)	—	—		—	5650
Airborne atmospheric chloride, mg/m ² . day*	—	—		31.4 (16.7)	250-350
Airborne atmospheric sulfur dioxide, mg/m ² . day	—	—		—	—
One year corrosion rate, µm/year (g/m ² .y)—					
—mild steel	35.5 (275.8)	18.1(140.6)	(120.5)	30.9 (240.1)	100–600 (300)
—zinc	4.94 (35.3)	1.64 (11.7)	7.9	6.22 (44.4)	3.0–7.1 (5.7)

* Mean value over year. Standard deviation in brackets to indicate variability.

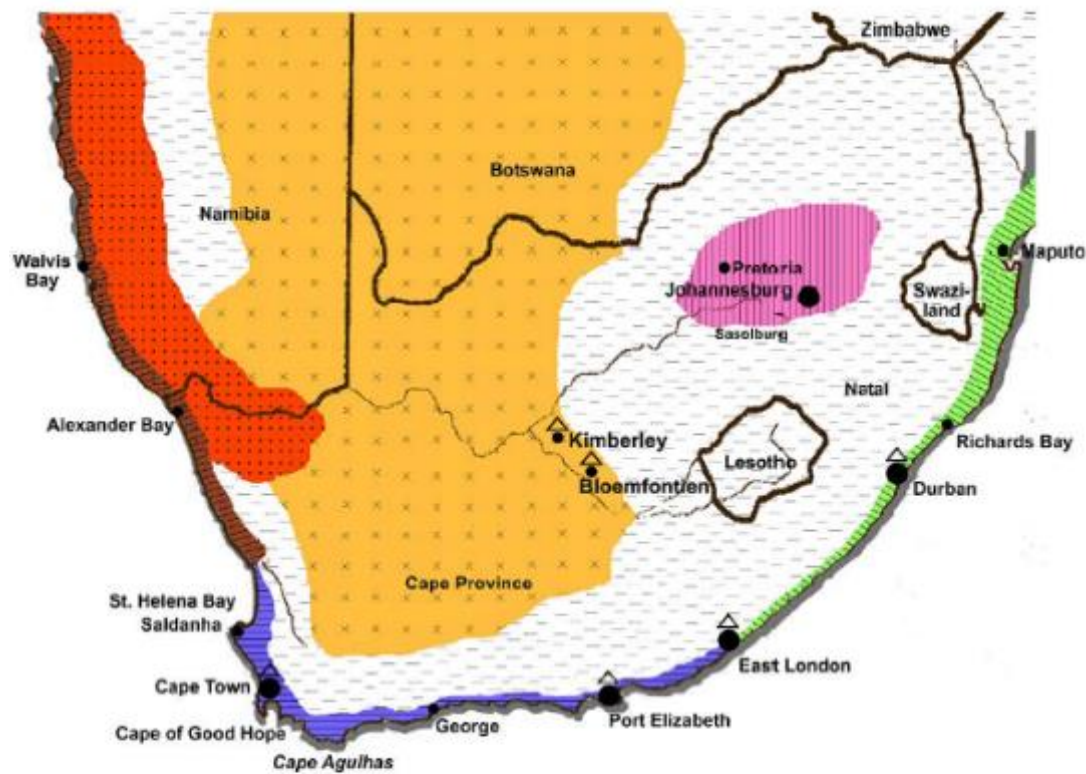
AUSTRALIA CORROSIVITY MAPPING

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS



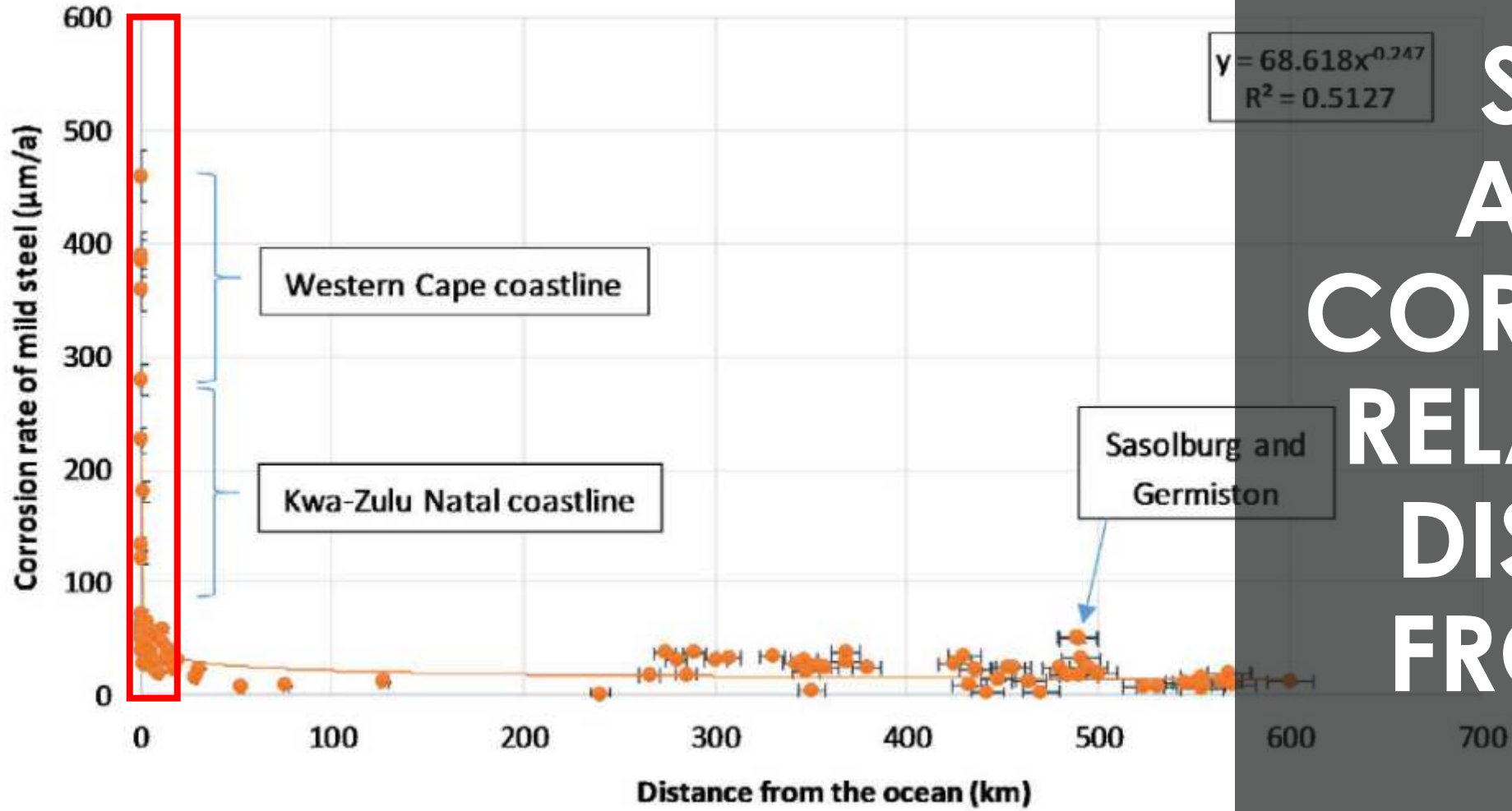
AUSTRALIA
CORROSIVITY
RELATIVE TO
DISTANCE
FROM SEA

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS



SOUTH AFRICA CORROSION MAPPING (OLD)

Key	Description	Type of corrosion	Mild steel corrosion rate $\mu\text{m}/\text{year}$	Galvanised steel sheet life in years
✕	Inland arid	Semi desert	5 – 10	> 30
—	Inland	Rural	10 – 20	> 20
•	Inland dry	Desert	< 5	> 30
▨	Inland urban	Inland industrial	15 – 40	5 – 15
△	Inland	Industrial	10 – 30	5 – 15
▨	Sub-tropical marine	Medium to severe marine	50 – 80	3 – 5
▨	Desert marine (mists)	Severe marine corrosion	80 – 100	0.5 – 2
▨	Temperate marine	Marine	30 – 50	3 – 7
▨	Intertidal to 5 km inland	Severe marine corrosion	100 – 300	Up to 3



SOUTH AFRICA CORROSION RATE RELATIVE TO DISTANCE FROM SEA

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

DISTANCE FROM SEA AFFECTS CORROSION OF AN ENVIRONMENT

An aerial photograph showing a coastline. The sea is on the left, and the land is on the right. A white arrow points from the sea towards the land, with the text '200METER' written below it. The land is covered in dense vegetation and has a rugged, hilly appearance. The text 'Cape Nature Walker Bay' is visible on the land.

200METER

Cape Nature Walker Bay

3 PERFORMANCE TESTS OF
DIFFERENT STANDARDS



1,000METER

*Cape Nature
Walker Bay*

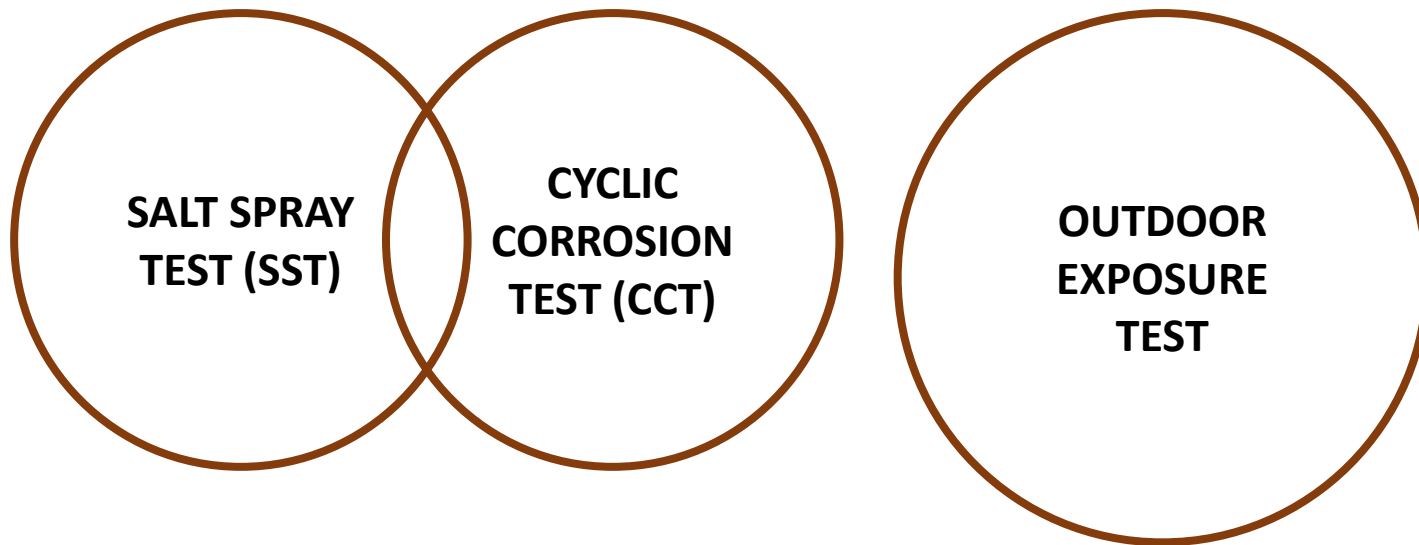
*Kleinrivier
Private Nature
Reserve*

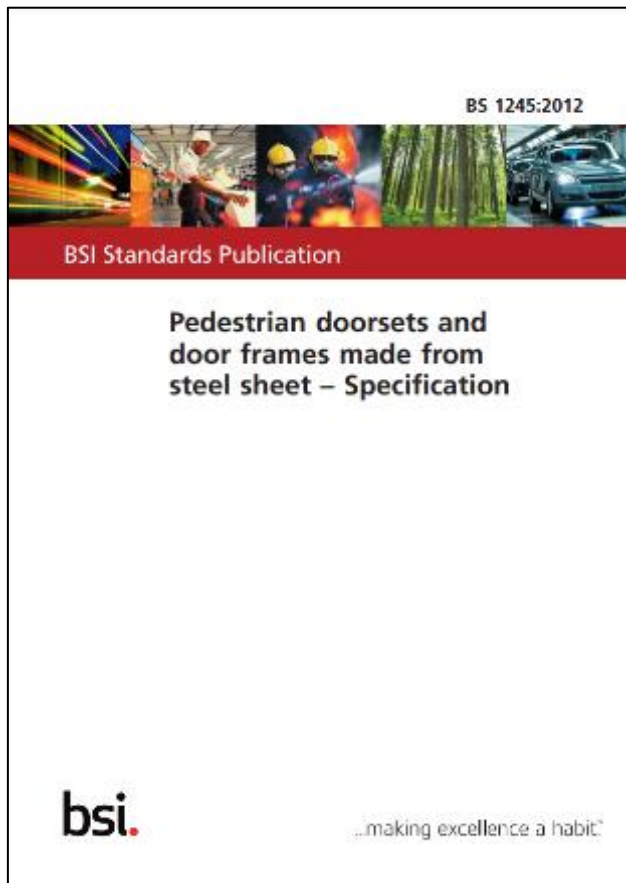
**FURTHER
MEANS LESS
CORROSIVE**

List of Tests	AS/NZS 2728	ASTM A755	JIS G 3322	MS 2383
Performance Test				
Humidity Resistance	Yes	Optional	Yes	Yes
Paint Durability	Yes	Optional	-	-
Corrosion Resistance	SST & CCT	Optional	SST / CCT	SST / CCT

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

TYPE OF CORROSION RESISTANCE TESTS

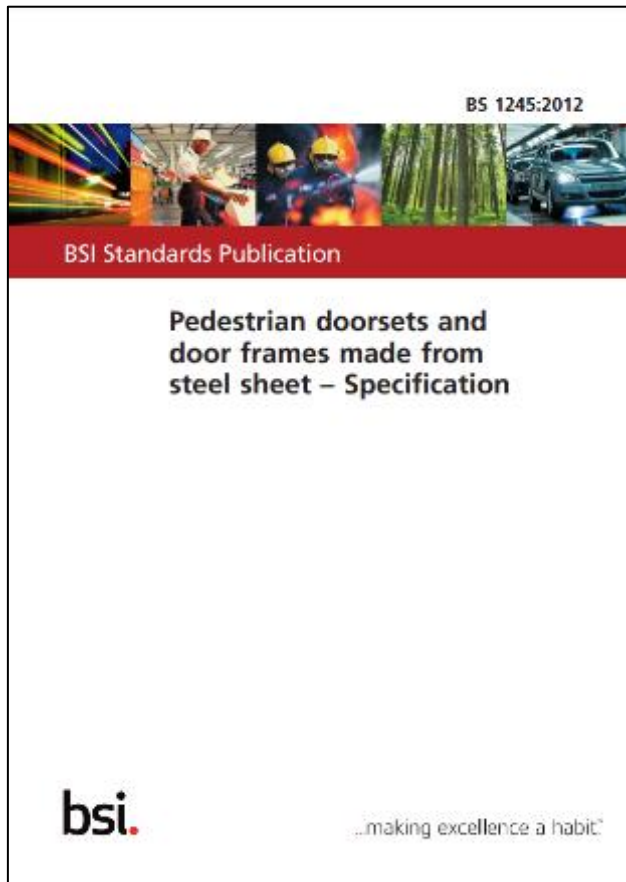




- Grade **0** – **NO DEFINED** corrosion resistance
- Grade **1** – **LOW** corrosion resistance
- Grade **2** – **MODERATE** corrosion resistance
- Grade **3** – **HIGH** corrosion resistance
- Grade **4** – **VERY HIGH** corrosion resistance
- Grade **5** – **EXCEPTIONALLY HIGH** corrosion resistance

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CORROSION RESISTANCE CLASSIFICATION FOR DOOR FRAME APPLICATION



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

RELATIVELY SHORT SALT SPRAY DURATIONS

Salt Spray Test (SST) Duration

- Grade **0** – **NO DEFINED** corrosion resistance → -
- Grade **1** – **LOW** corrosion resistance → 24 hours
- Grade **2** – **MODERATE** corrosion resistance → 48 hours
- Grade **3** – **HIGH** corrosion resistance → 96 hours
- Grade **4** – **VERY HIGH** corrosion resistance → 240 hours
- Grade **5** – **EXCEPTIONALLY HIGH** corrosion resistance → 480 hours



- C1 – **VERY LOW**
- C2 – **LOW**
- C3 – **MEDIUM**
- C4 – **HIGH OR TROPICAL**
- C5-I – **VERY HIGH (INDUSTRIAL)**
- C5-M – **VERY HIGH (GEOTHERMAL, MARINE)**

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CORROSION RESISTANCE CLASSIFICATION FOR EXTERIOR CLADDING APPLICATION



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CLASSIFICATION & SALT SPRAY TEST DURATIONS

Salt Spray Test (SST) Duration

- C1 – **VERY LOW** —————→ -
- C2 – **LOW** —————→ 100 hours
- C3 – **MEDIUM** —————→ 500 hours
- C4 – **HIGH OR TROPICAL** —————→ 1000 hours
- C5-I – **VERY HIGH (INDUSTRIAL)** —————→ 2000 hours
- C5-M – **VERY HIGH (GEOTHERMAL, MARINE)** —————→ 2000 hours



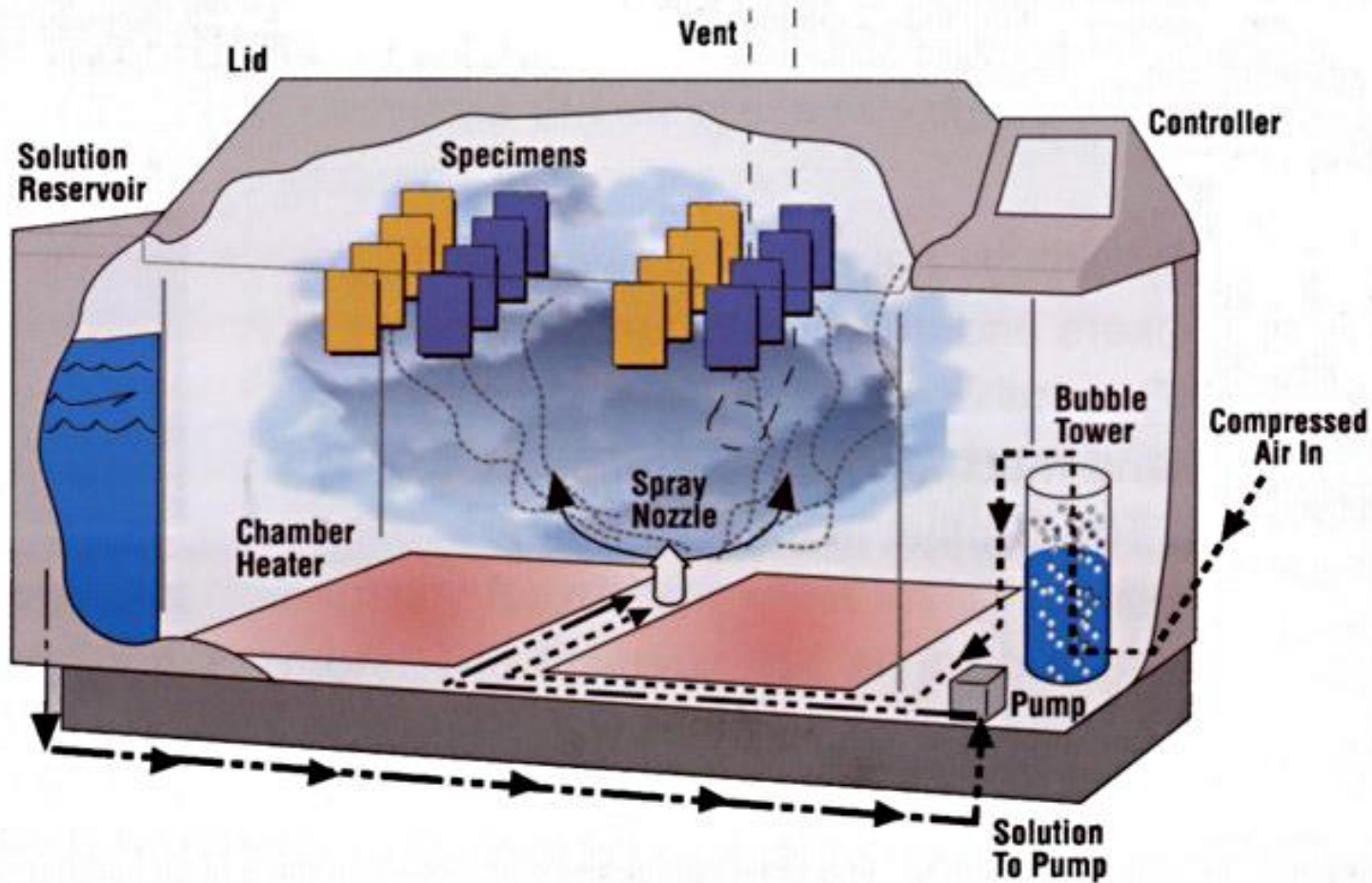
3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CLASSIFICATION & CYCLIC CORROSION TEST DURATIONS

Cyclic Corrosion Test (CCT) Duration

- C1 – **VERY LOW** ————— -
- C2 – **LOW** —————→ 200 hours
- C3 – **MEDIUM** —————→ 1000 hours
- C4 – **HIGH OR TROPICAL** —————→ 2000 hours
- C5-I – **VERY HIGH (INDUSTRIAL)** —————→ 4000 hours
- C5-M – **VERY HIGH (GEOTHERMAL, MARINE)** —————→ 4000 hours

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS



**SST & CCT ARE
SIMULATED
TESTS IN A
CHAMBER**



Designation: B117 - 18

Standard Practice for Operating Salt Spray (Fog) Apparatus¹

This standard is issued under the fixed designation B117; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or approval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

AS 2331.3.1—2014
Reconfirmed 2017

Australian Standard™

Methods of test for metallic and related coatings

Method 3.1: Corrosion and related property tests—Neutral salt spray test (NSS test)

INTERNATIONAL
STANDARD

ISO
9227

Fourth edition
2017-03

Corrosion tests in artificial
atmospheres — Salt spray tests

Essais de corrosion en atmosphères artificielles — Essais aux brouillards salins

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

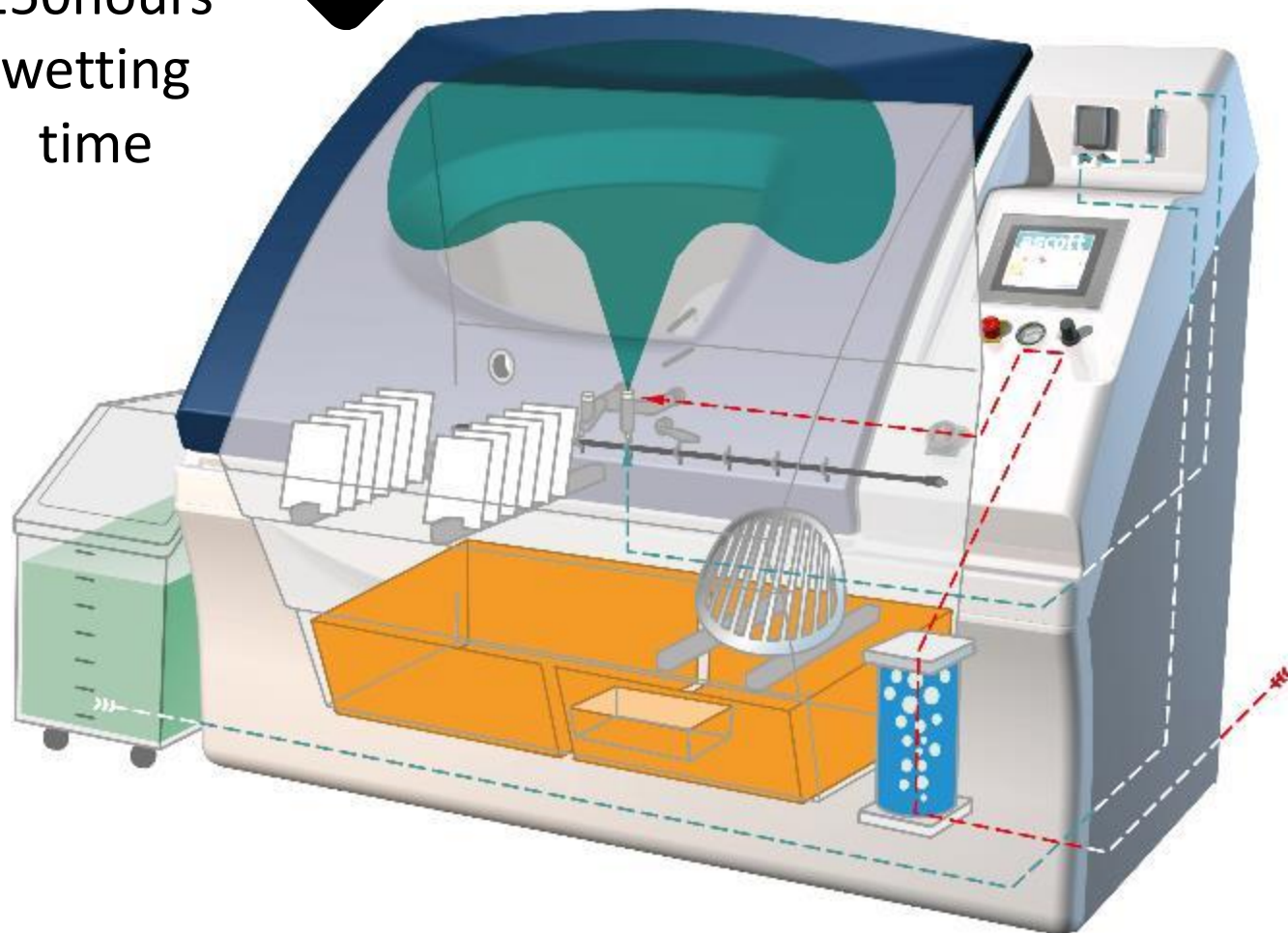
SALT SPRAY TEST STANDARDS

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CONTINUOUS SALT SPRAY TEST

Source:
<http://www.paintinfo.com/TechInfo/Introduction%20to%20Cyclic%20Corrosion%20Testing.pdf>; ISO 9227:2012; AS 2331.3.1

5% NaCl
35°C
250hours
wetting
time





3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

EXAMPLE OF SALT SPRAY TEST RESULT

ASTM B117

3. Significance and Use

3.1 This practice provides a controlled corrosive environment which has been utilized to produce relative corrosion resistance information for specimens of metals and coated metals exposed in a given test chamber.

3.2 Prediction of performance in natural environments has seldom been correlated with salt spray results when used as stand alone data.

3.2.1 Correlation and extrapolation of corrosion performance based on exposure to the test environment provided by this practice are not always predictable.

3.2.2 Correlation and extrapolation should be considered only in cases where appropriate corroborating long-term atmospheric exposures have been conducted.



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

**NO DIRECT
CORRELATION
WITH
OUTDOOR
EXPOSURE
TEST**

Salt spray was first used for corrosion testing around 1914. In 1939, the neutral salt spray test was incorporated as ASTM B117.¹ This traditional salt spray specifies a continuous exposure to a 5% salt fog at 35°C. During the course of 80 years of use, there have been many modifications and refinements to B117. In spite of all these refinements, there has long been general agreement that "salt spray" test results do not correlate well with the corrosion seen in actual atmospheric exposures. Nevertheless, B117

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3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

RESULTS MUST BE TAKEN WITH A GRAIN OF SALT

AS 2331.3.1

1 SCOPE


This Standard sets out the method for the neutral salt spray (NSS) test for the assessment of corrosion resistance of inorganic and organic coatings on metallic substrates.

NOTES:

- 1 The method does not specify the type of test item, the exposure period or the assessment criteria. Such details are normally specified in the relevant product Standard or determined by agreement between the purchaser and the supplier.
- 2 It is important that the results obtained from the test are not regarded as having a direct correlation with environments in which items may be exposed in service or as indicating the relative corrosion resistance of different coatings.
- 3 The test procedures described in this Standard do not necessarily include all of the

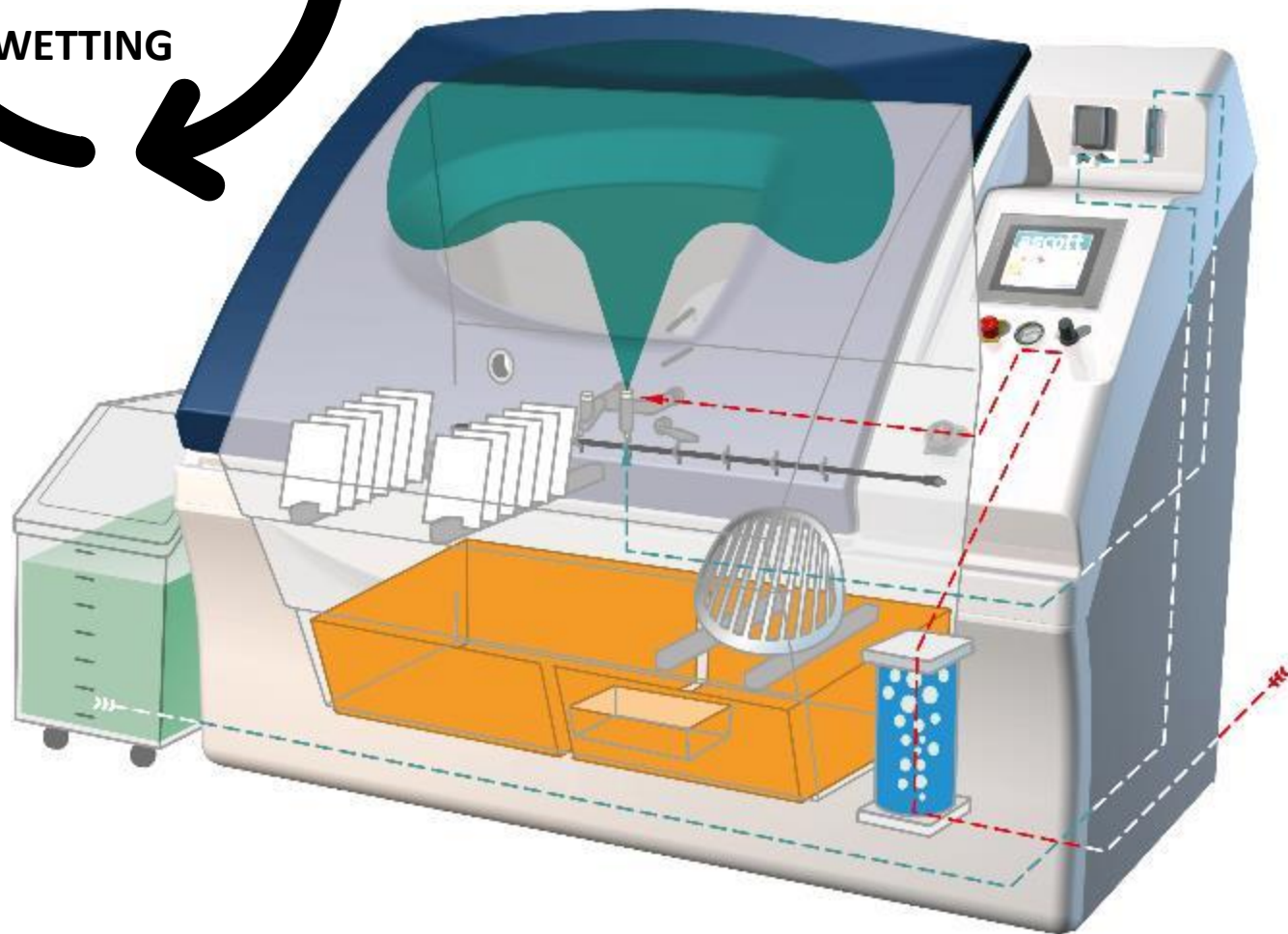
ISO 9227:2017

The salt spray methods are all suitable for checking that the quality of a metallic material, with or without corrosion protection, is maintained. They are not intended to be used for comparative testing as a means of ranking different materials relative to each other with respect to corrosion resistance or as means of predicting long-term corrosion resistance of the tested material.



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

**SHORTFALL OF
RELYING
SOLELY ON
SALT SPRAY
TEST (SST)**



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CYCLIC CORROSION TEST

③ PERFORMANCE TESTS OF DIFFERENT STANDARDS

CCT
↓

**EXTERIOR
14 Months**



**PROHESION
1400 Hrs.**



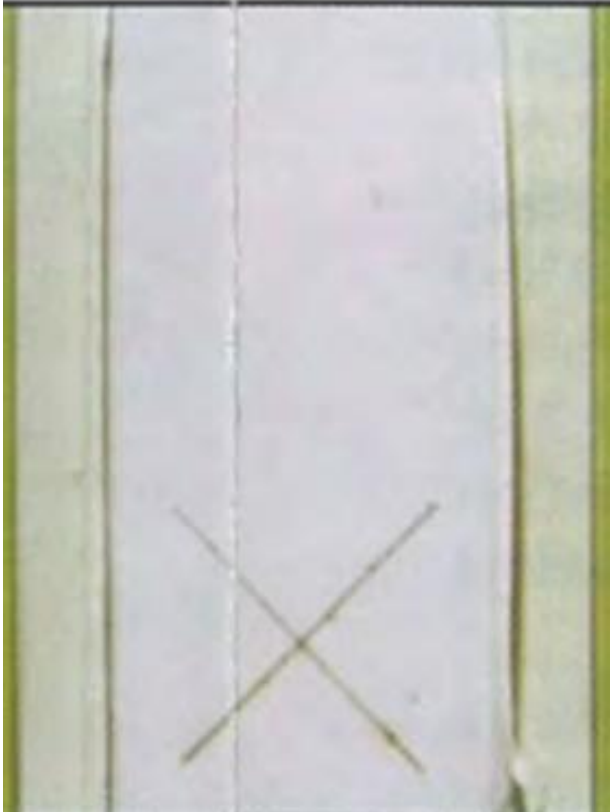
**SALT SPRAY
1400 Hrs.**



**SALT SPRAY
TEST RESULT
DEVIATES
FROM OTHERS**

CCT
↓

**EXTERIOR
4 Yrs.**



**PROHESION
600 Hrs.**



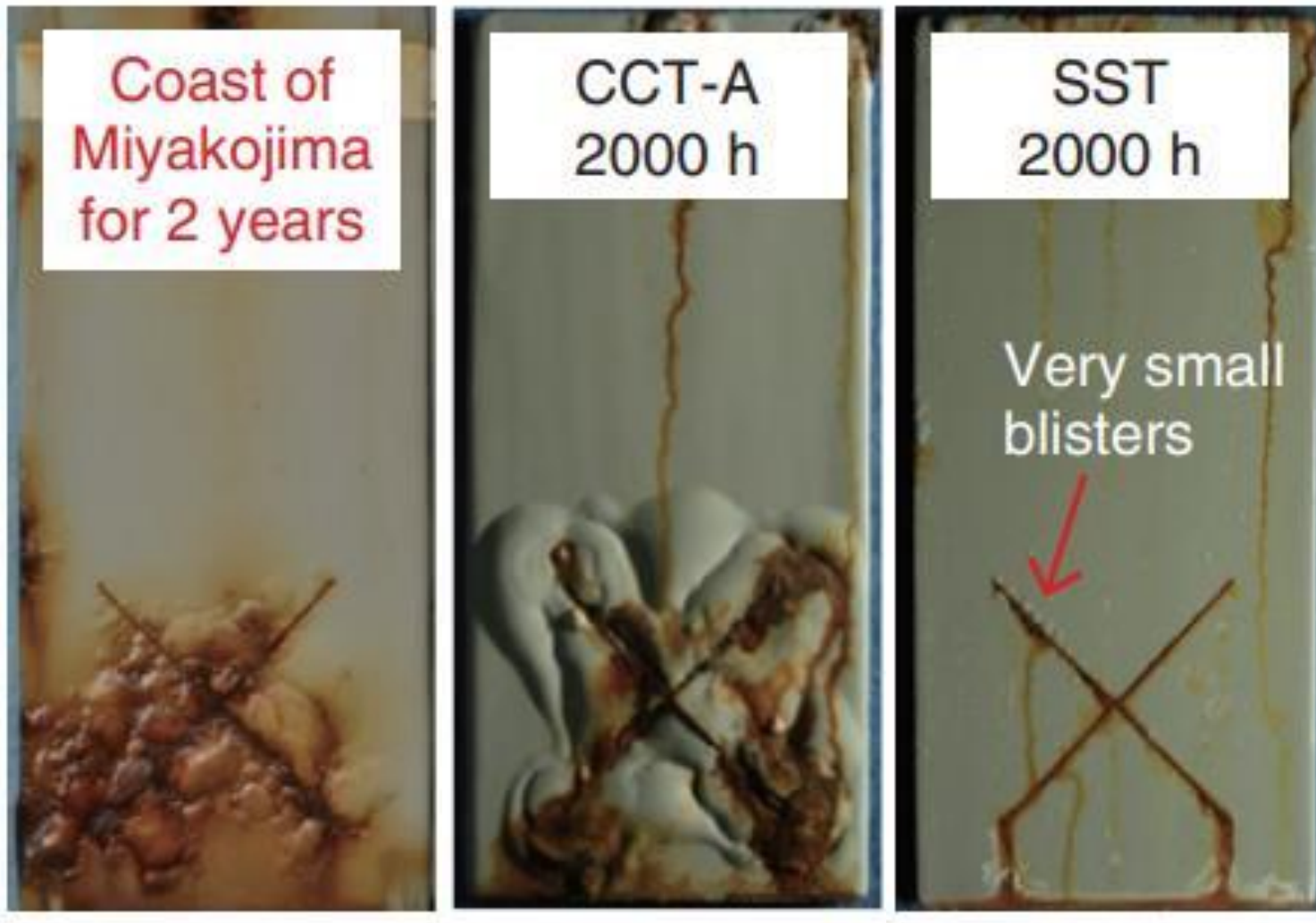
**SALT SPRAY
600 Hrs.**



**3 PERFORMANCE TESTS OF
DIFFERENT STANDARDS**

**SALT SPRAY
TEST RESULT
DEVIATES
FROM OTHERS**

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS



SALT SPRAY TEST RESULT DEVIATES FROM OTHERS

TABLE J2
CHARACTERIZATION OF AUSTRALIAN CORROSION TEST SITES

Criteria	Owner/Site				
	BlueScope Steel			CSIRO	Belmont (Beach) NSW
	Bellambi Point	Shellharbour	Port Kembla	Flinders marine site	
Rating as to ISO 9223	C4	C3	C5	C4	C5
Latitude/longitude	34.6/150.8	34.6/150.8	34.5/150.9	38.29/145.2	32.0/152.4
Orientation	—	—	—	N	Any
Distance to sea, km	0.05	0.3	0.05	0.1	0.2
Direction of prevailing winds	NE/S	NE/SE	NE/SE	W	—
Degree of industrialization	Nil	Nil	Low	Nil	Nil
Average annual rainfall, mm	1580	1580	1277	750	1142
Annual mean temperature—					
—at 9 a.m., °C	17	17	17.6	14	16.7
—at 3 p.m., °C	19	19	19.4	16	19.8
—overall, °C	17	17	—	15	—
Solar radiation, mWh/cm ²	460	460	—	430	480
Average humidity—					
—winter, %	—	—	—	—	—
—summer, %	—	—	—	—	—
—annual, %	62 to 67	60 to 67	—	67	65
Time of wetness—annual (number of hours the relative humidity exceeds 80%)	—	—	—	—	5650
Airborne atmospheric chloride, mg/m ² . day*	—	—	—	31.4 (16.7)	250-350
Airborne atmospheric sulfur dioxide, mg/m ² . day	—	—	—	—	—
One year corrosion rate, µm/year (g/m ² .y)—					
—mild steel	35.5 (275.8)	18.1(140.6)	(120.5)	30.9 (240.1)	100–600 (300)
—zinc	4.94 (35.3)	1.64 (11.7)	7.9	6.22 (44.4)	3.0–7.1 (5.7)

* Mean value over year. Standard deviation in brackets to indicate variability.

AUSTRALIA CORROSIVITY MAPPING



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

ISO 9223 EXPOSURE SITE (C2)



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

ISO 9223
EXPOSURE
SITE (C4)

ISO 9223 C4

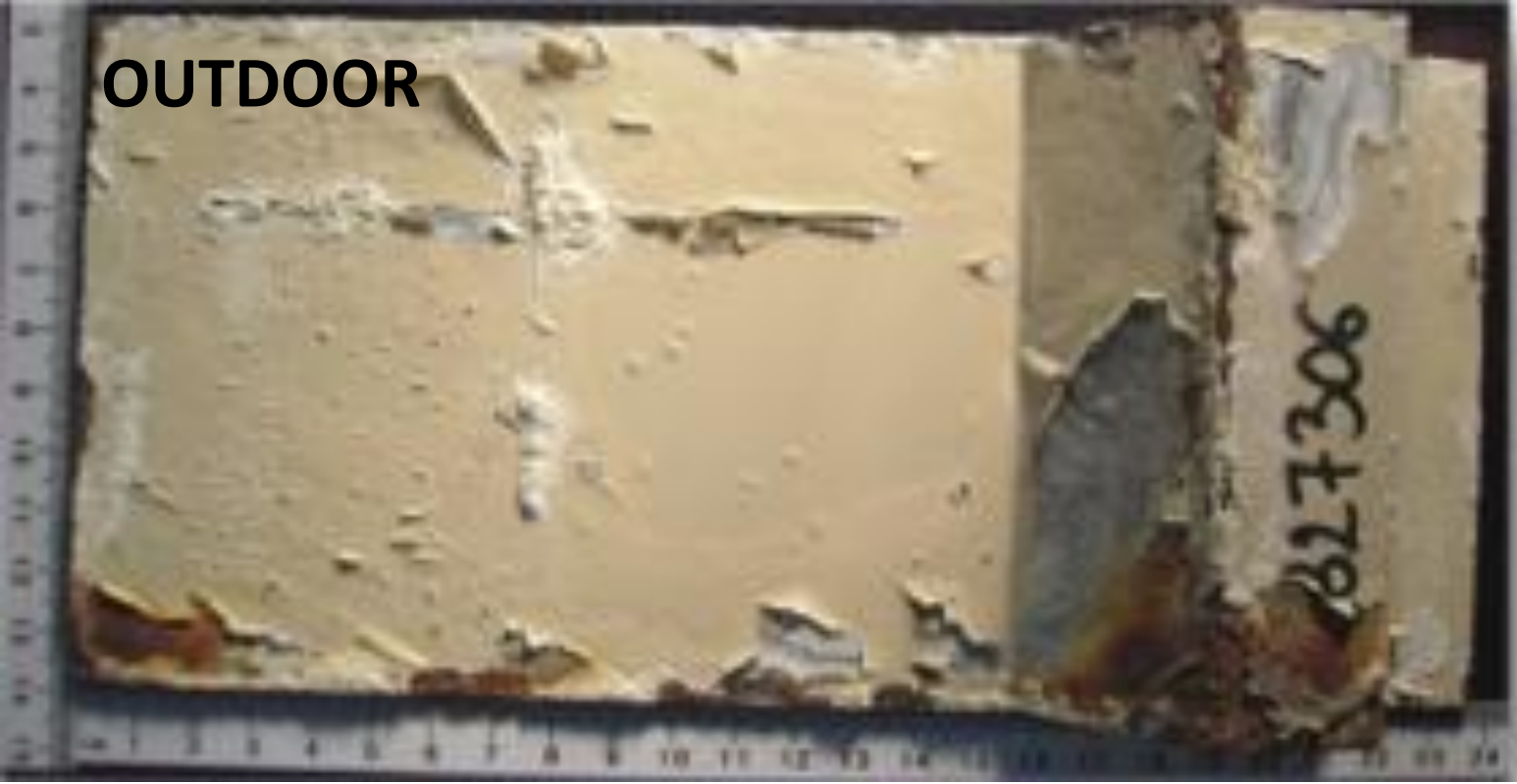
ISO 9223 C3

ISO 9223 C2

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

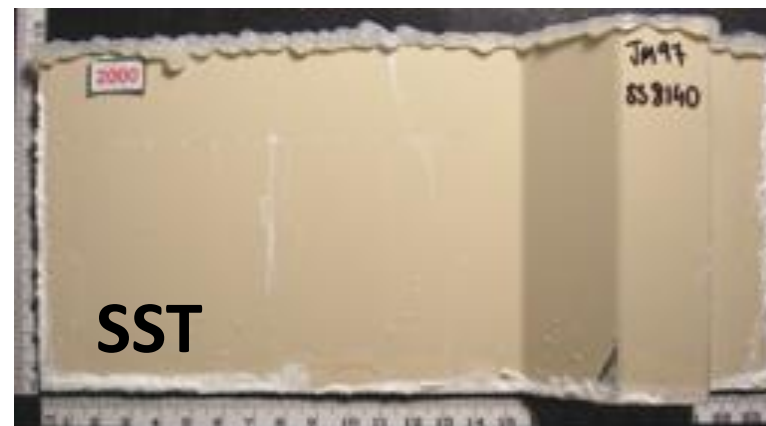
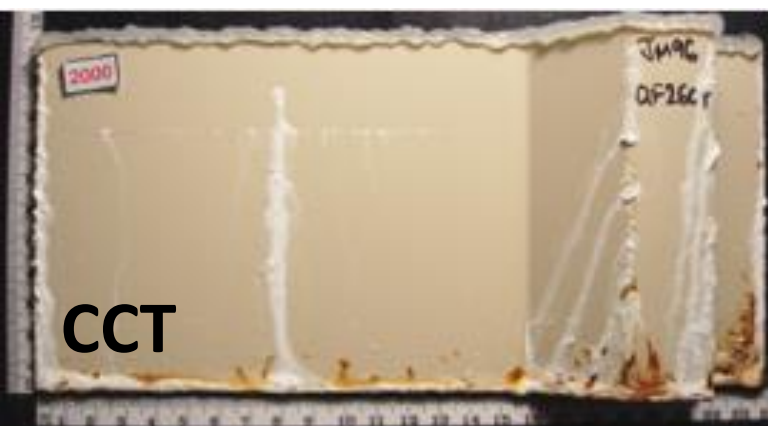
OUTDOOR EXPOSURE RESULTS OF SAME PRODUCT SPEC.

OUTDOOR

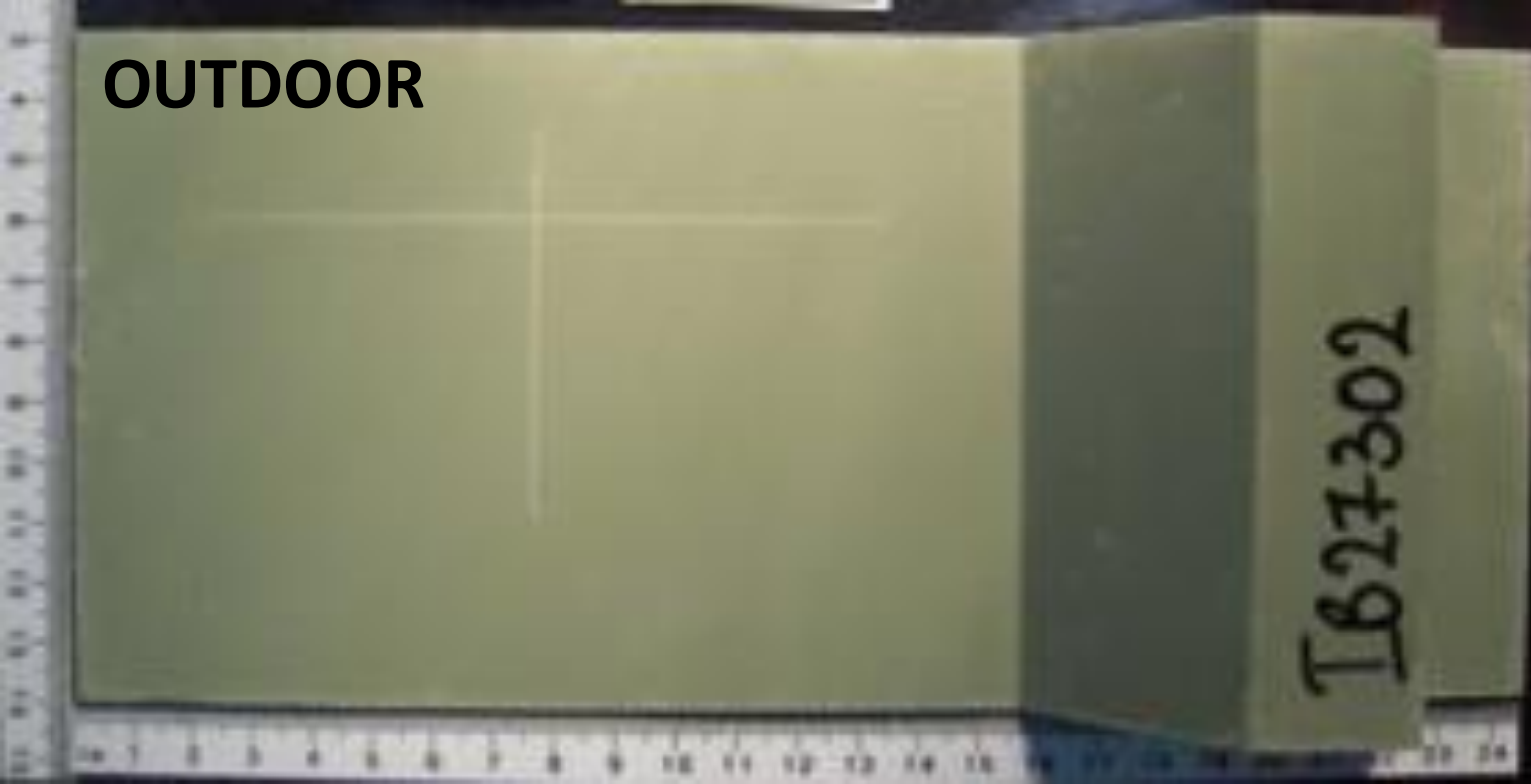


3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

OUTDOOR EXPOSURE RESULT VS CCT / SST

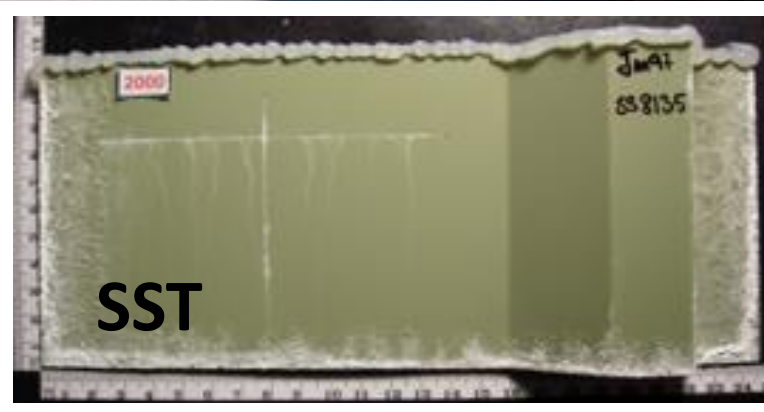


OUTDOOR



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

OUTDOOR EXPOSURE RESULT VS CCT / SST



5.10 Corrosion resistance

The accelerated corrosion tests to be carried out with respective product corrosivity category are given in 5.10.1 and 5.10.2. Product corrosivity category C4 and C5, the purchaser and manufacturer have an option to choose either 5.10.1 or 5.10.2.

5.10.1 SALT SPRAY TEST

When suitably prepared test specimens (scribed or unscribed, as appropriate) are exposed to the corrosion test in accordance with ISO 9227 (Neutral salt spray, NSS) for specified duration as in Table 4, the prefabricated flat steel product shall comply with the requirements of Table 5.

Table 4. Exposure duration for neutral salt spray tests

Corrosivity Category	Exposure duration (h)
C2	100
C3	500
C4 (T)	1 000
C5-I	2 000
C5-M	2 000

5.10.2 CYCLIC CORROSION TEST

When suitably prepared test specimens (scribed or unscribed, as appropriate) are exposed to the corrosion test in accordance with ISO 14993 for specified duration as in Table 6, the prefabricated flat steel product shall comply with the requirements of Table 7.

Table 6. Exposure duration for cyclic corrosion test

Corrosivity Category	Exposure duration (h)
C2	200
C3	1 000
C4 (T)	2 000
C5-I	4 000
C5-M	4 000

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CURRENT MS 2383 PERFORMANCE REQUIREMENTS

5.10 Corrosion resistance

The accelerated corrosion tests to be carried out with respective product corrosivity category are given in 5.10.1 and 5.10.2. Product corrosivity category C4 and C5, the purchaser and manufacturer have an option to choose either 5.10.1 or 5.10.2.

CORROSIVITY	Salt Spray Test (SST)	Cyclic Corrosion Test (CCT)
C2	100 hours	-
C3	500 hours	-
C4	1000 hours	2000 hours
C5-I	2000 hours	4000 hours
C5-M	2000 hours	4000 hours

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

CURRENT MS 2383 PERFORMANCE REQUIREMENTS

1 Scope

This Malaysian Standard specifies performance requirements for continuously organic coated/laminated flat steel product and that are intended for fabrication into products for use in the construction or finishing of buildings.

This standard classifies prefinished flat steel products into six types according to their performance, in respect to durability and aesthetics, in environments of varying severity.

NOTES:

1. Advice and recommendations on information to be supplied by the purchaser at the time of enquiry or order are contained in the purchasing guidelines set out in Annex A.
2. The performance of a coating will be dependent on the corrosion resistance of the substrate in the particular environment and on climatic influences that directly affect the coating. Such influences include solar radiation and the presence of water vapour (see Annex B).

3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

RECAP THE SCOPE

SALT SPRAY TEST (SST)



CYCLIC CORROSION TEST (CCT)



3 PERFORMANCE TESTS OF DIFFERENT STANDARDS

**SAME
SUBSTRATE
TESTED IN C4
CATEGORY**

**“WILL PRODUCT(A)
CERTIFIED TO A
STANDARD **PERFORM**
SIMILARLY TO
PRODUCT(B)
CERTIFIED TO THE
SAME STANDARD?”**

3 PERFORMANCE TESTS OF
DIFFERENT STANDARDS

FINAL NOTE



SUMMARY

1. THE **SCOPE** OF A STANDARD
2. THE QUALITY **SPECS & REQUIREMENTS**
3. THE MORE **REALISTIC PERFORMANCE TESTS**

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated
Japanese

JIS G 3322 2008

(JISF)

Prepainted hot-dip 55 %
aluminium-zinc alloy-coated sheet
and strip

ICS: 77.140.50

Reference number: JIS G 3322

PROTECTED



**MALAYSIAN
STANDARD**

MS 1196:2020

Continuous hot-dip aluminium/zinc alloy-
coated sheet of commercial, drawing and
structural qualities
(Third revision)

ICS: 77.140.50

Description: continuous, hot-dip, aluminium-zinc coated, steel, sheet, strip

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DEPARTMENT OF STANDARDS MALAYSIA

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AS 1397—2011

AS 1397—2011
(Incorporating Amendment No. 1)

Australian Standard®

Hot-dip metallic coated steel
Coatings of zinc and
aluminium and

QUESTION & ANSWER SESSION



THANK YOU

Colorbond®

VERMOE™

Zincalume®

TrueCore®



events@bluescope.com.my



NS BlueScope Malaysia