



BRANZ Appraised
Appraisal No. 1110 [2020]

IKO ASPHALT ROOF SHINGLES

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BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 IKO Asphalt Roof Shingles are fibreglass reinforced surfaced with mineral chips with a ceramic coating. They are available in the following series types: Dynasty, Nordic, Cambridge and Marathon Plus AR.
- 1.2 The shingles and flashing accessories form a roofing system when installed over a plywood substrate and roofing underlayment.

Scope

- 2.1 IKO Asphalt Roof Shingles have been appraised as a roof cladding for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to floor plan area and building height; and,
 - constructed with timber roof framing and plywood sheathing complying with the NZBC; and,
 - where the roof slope is 9.0° or greater; and,
 - situated in NZS 3604 Wind Zones up to and including Extra High.
- 2.2 The system must be installed in accordance with the Technical Literature by a IKO Industries Ltd trained and approved installer.

Building Regulations

3.1 New Zealand Building Code [NZBC]

In the opinion of BRANZ, IKO Asphalt Roof Shingles, if used, designed, installed and maintained in accordance with the statements and conditions of the Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. IKO Asphalt Roof Shingles meet the requirements arising for loads from self-weight, gravity loads, temperature, snow, wind, impact and creep, i.e. B1.3.3 (a), (b), (c), (g), (h), (j) and (q). See Paragraphs 8.1 - 8.7.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. IKO Asphalt Roof Shingles meet this requirement. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. IKO Asphalt Roof Shingles meet these requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. IKO Asphalt Roof Shingles meet this requirement and will not present a health hazard to people.

Technical Specifications

- 4.1 Components and accessories supplied by IKO Industries Ltd are as follows:
- IKO Asphalt Roof Shingles are fibreglass reinforced surfaced with mineral chips with a ceramic coating. The shingles are combined with plywood sheathing, a roofing underlayment and various flashing accessories to form a roofing system.
 - IKO Asphalt Roof Shingles are available in various profiles, colours and weights. The following are the brand names of the different profiles: Dynasty, Nordic, Cambridge and Marathon Plus AR.

Accessories:

- **Hip and Ridge™ Plus** – a ridge cap shingle.
- **Leading Edge Plus™** – a starter strip.
- **Stormtite Underlayment** – a non-woven polyolefin underlayment. It is used as an alternative to #15 and #30 underlayment under the asphalt tiles when appropriate.
- **#15 and #30 Underlayment** – standard bitumen impregnated roofing felt complying with ASTM:D226 standards for use under the shingles. The underlayment is installed directly onto the plywood substrate and is supplied in approximately 40 m² rolls. #30 underlayment is a thicker grade installed on lower pitched roofs.
- **Stormshield Ice & Water Protector** – a self adhesive SBS Modified bitumen membrane.
- **Plywood sheathing** – minimum 15 mm thick, grade DD or better plywood complying with AS/NZS 2269. Minimum treatment requirements are untreated ply for ventilated truss roof cavities above 10° and H3 treated plywood must also be used where the plywood edge is unprotected at the eaves. Concealed plywood edges at the eaves do not need to be treated. *[Note: Using plywood sheathing as structural bracing should be avoided as there may be additional requirements.]*
- **Plywood nails** – ring shanked, galvanised flooring grade nails 64 mm long having a minimum 3 mm diameter shank with 7 mm x 5 mm ‘D’ head.
- **Shingling nails** – stainless steel or compliant hot-dip galvanized gun nails for nailing roof shingles, semi ring shanked, in lengths of 32 mm or 25 mm and having a minimum of 3 mm diameter shank with 9 mm diameter head.

Table 1. Shingle Profiles

Shingle	Dynasty	Nordic	Cambridge	Marathon Plus AR
Type	Laminated	Laminated	Laminated	3-Tab
Size [mm]	349 x 1038	349 x 1038	349 x 1038	337 x 1000
Weather Exposure [mm]	142	142	142	142
Approx. mass [kg/m ²]	11.2	11.2	11.2	10.5
Available Colours	15	9	11	11
Approx. total mass [shingle + 15 mm plywood]	21.2	21.2	21.2	20.2

Handling and Storage

- 5.1 IKO Asphalt Roof Shingles must be transported and handled with care to avoid damaging the pre-finished surfaces.
- 5.2 Long term storage of shingles and accessories must be under dry, ventilated cover. For short term storage on site, shingles must be stored flat, no more than two pallets high, and off the ground.
- 5.3 Handling and storage of all materials supplied by IKO Industries Ltd, whether on or off site, are under the control of the IKO Industries Ltd trained and approved installer. Materials must be handled and stored in accordance with the relevant manufacturer’s instructions.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for IKO Asphalt Roof Shingles. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Roof framing must comply with NZS 3604, or be to a specific design in accordance with NZS 3603 and AS/NZS 1170.
- 7.2 Timber roof framing must be treated as required by NZS 3602 for the building design application.
- 7.3 Roof design must take into account any requirements for areas subject to regular snowfalls as per the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.3.
- 7.4 Where the roof slope is between 9° and 18° the shingle underlayment must be Stormshield Ice & Water Protector, or two layers of #15 underlayment, or two layers of Stormtite underlayment offset by 50%, or one layer of #30 underlayment. Where the roof slope is greater than 18° one layer of #15 underlayment or Stormtite underlayment can be used. See Paragraphs 16.3 to 16.6 for further information.
- 7.5 The collection of potable water has not been assessed and is outside the scope of this Appraisal.

Structure

Mass

- 8.1 The approximate mass of the IKO Asphalt Roof Shingles is given in Table 1. A light roof is defined in NZS 3604 as a roof with a roofing material [cladding and any sarking] having a mass not exceeding 20 kg/m². A heavy roof is defined in NZS 3604 as a roof with a roofing material [cladding and any sarking] having a mass in excess of 20 kg/m², but not exceeding 60 kg/m².

Snow

- 8.2 IKO Asphalt Roof Shingles are suitable for use in areas where buildings are designed for a 1 kPa snow loading. Refer to IKO Industries Ltd for installation details for snow-prone areas.

Wind Zones

- 8.3 When fixed in accordance with the manufacturer's instructions and this Appraisal, IKO Asphalt Roof Shingles are suitable for use in all NZS 3604 Wind Zones, up to, and including Extra High. See Paragraph 16.2.

Plywood Sheathing

- 8.4 Where LOSP treated plywood is used, the solvents must be allowed to evaporate off for at least one week before installation of the shingle underlayment.
- 8.5 Rafters or trusses must be at maximum 900 mm centres for 15 and 17 mm thick plywood. *[Note: plywood manufacturer's Technical Literature must be referred to for confirmation of minimum plywood thickness and grades relative to roof pitch and framing centres.]*
- 8.6 The plywood face grain must be laid at right angles to supports. The sheets must be laid with staggered joints in a brick bond pattern.
- 8.7 Tongue and groove plywood edges must be butt-jointed with no gaps between the sheet edges. Square plywood edges must have a 2 - 3 mm gap between the sheet edges.

Durability

Serviceable Life

- 9.1 IKO Asphalt Roof Shingles are expected to have a minimum serviceable life of at least 15 years provided maintenance is carried out in accordance with this Appraisal and the Technical Literature.

Weathering

- 9.2 IKO Asphalt Roof Shingles may lose some stone granules over a period of time. On aging, some surface cracking may appear. These cracks will not affect the weathertightness of the roof covering within the minimum 15 years requirement.

Maintenance

- 10.1 Little maintenance should be required apart from the removal of lichen, moss and organic growth that may become established and the removal of accumulations of the stone granules in spouting.
- 10.2 Annual inspections must be made to ensure that all aspects of the roof cladding, including the pre-finished coating, the flashings and any joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately.
- 10.3 A water-based chemical treatment recommended by IKO Industries Ltd as being suitable for use with bitumen-based products must be used for the removal of organic material. Petroleum-based solvents or cleaners must not be used.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to IKO Asphalt Roof Shingles from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Control of External Fire Spread

- 12.1 Fire rated roof construction systems using the IKO Asphalt Roof Shingles have not been assessed and are outside the scope of this Appraisal.

External Moisture

- 13.1 IKO Asphalt Roof Shingles, when installed in accordance with this Appraisal, will shed precipitated moisture and therefore meet the performance requirements of NZBC Clause E2.3.1. They will also prevent the penetration of water that could cause undue dampness, or damage to building elements, therefore meeting the performance requirements of NZBC Clause E2.3.2.

Construction Moisture

- 13.2 Roofs clad with IKO Asphalt Roof Shingles, if ventilation requirements are met as in the Technical Literature, allow excess moisture present at the completion of construction to be dissipated without permanent damage to building elements and therefore meet the performance requirements of NZBC Clause E2.3.6. This is achieved by ensuring the construction moisture levels are no higher than 18% when the shingles are laid and before the ceiling is closed-in, as well as providing an adequate level of roof cavity ventilation.

Internal Moisture

- 14.1 Adequate roof space ventilation is necessary to ensure roof space internal moisture levels and temperatures are controlled. Roof space ventilation requirements are given in the Technical Literature.
- 14.2 Ideally, air should be allowed to flow from the bottom to the top of the roof. In skillion-type roofs, a clear, uninterrupted, ventilated air gap of at least 25 mm must be present. Plywood with tongue-and-groove joints should be used on skillion roofs to minimise the restrictions caused by timber blocking. If required by the roof design or occupancy, perforated soffit linings, soffits and ridge vents should be used to minimise the quantity of moisture and heat accumulating in the roof space.
- 14.3 IKO Industries Ltd should be consulted for further advice and information on roof ventilation and moisture control, especially when the roof design is unusual.

Installation Information

Installation Skill Level Requirements

- 15.1 Installation of all components and accessories supplied by IKO Industries Ltd must be completed by installers trained and approved by IKO Industries Ltd.
- 15.2 Installation of the components supplied by the building contractor must always be carried out in accordance with the IKO Asphalt Roof Shingles Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License Class.
- 15.3 Technical Literature must be referred to during all inspections of the IKO Asphalt Roof Shingles installations.

System Installation

Plywood Sheathing

- 16.1 Plywood and framing must have a maximum moisture content of 18% at the time of the installation of the shingles.
- 16.2 The plywood must be designed and installed in accordance with the plywood manufacturer's instructions.

Shingle Underlayment

- 16.3 The shingle underlayment must be tightly laid horizontally across the roof, and completely cover hips, ridges [except where ridge vents are used], and valleys.
- 16.4 When the roof pitch is greater than 18°, one layer of Stormtite is required or one layer of #15 or #30 underlayment. The upper sheets must be lapped by at least 100 mm over the lower sheets.
- 16.5 When the roof pitch is between 9° and 18°, either one layer of Stormshield Ice and Water Protector or two layers of #15 underlayment lapped by half the width of the roll plus 25 mm [resulting effectively in a double thickness of underlayment] is required. End laps must be at least 200 mm.
- 16.6 Only sufficient fasteners to temporarily hold the underlayment in place need be used.

Fixing Shingles

- 16.7 Shingles are fixed in Low and Medium Wind Zones by four evenly spaced nails per shingle, one of which is located 25 mm in from each edge. In High, Very High, and Extra High Wind Zones this is increased to six nails [except Dynasty and Nordic that may still use 4 nails] and seal down each shingle at time of application with three 1" diameter spots of roofing cement placed under the shingle 2" above the bottom edge and equally spaced along the shingle. Fixing methods other than stainless steel and hot-dip galvanized nails have not been assessed and are outside the scope of this Appraisal. Care must be taken to ensure the fasteners are driven in straight and are finished flush with the shingle surface.
- 16.8 Adhesive must be laid in spots on top of all 'drip edges' or eaves where present. The spots of sealant should be approximately 20 mm from the edge of the roof. Where required, adhesive must also be used to seal under or hold down shingles at ridges, hips, upstands, and around penetrations.

Health and Safety

- 17.1 Safe use and handling procedures for IKO Asphalt Roof Shingles are provided in the manufacturer's Technical Literature.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

18.1 The following tests have been carried out by overseas laboratories in order to show compliance with ASTM D3462-1992: behaviour on heating; tear strength; fire resistance; fastener pull-through resistance; pliability; wind resistance; penetration of asphalt; asphalt softening point; compatibility; minimum net mass and average net mass; and mass of glass mat-asphalt and mineral matter.

Other Investigations

- 19.1 Weathertightness, structural and durability opinions have been provided by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.
- 19.3 IKO Asphalt Roof Shingles are the subject of ICC Evaluation Service, Inc. Report No. ESR 3532.
- 19.4 Site inspections have been undertaken by BRANZ to assess the practicability of installation.
- 19.5 The long-term performance of properly installed mastic-bonded and self-adhesive roofing shingles in New Zealand and many countries overseas, along with the durability and non-hazardous nature of the materials used has been noted. The overseas and New Zealand experience of asphalt roofing shingles forms the basis of the durability opinion.

Quality

- 20.1 The manufacture of IKO Asphalt Roof Shingles has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 20.2 The quality management system of the IKO Asphalt Roof Shingles manufacturer has been assessed by ICC Evaluation Service Inc. and is covered in ES Reports ESR-3532.
- 20.3 The quality of the supply of materials and accessories is the responsibility of IKO Industries Ltd.
- 20.4 Quality on site is the responsibility of the IKO Industries Ltd trained and approved installer.
- 20.5 Designers are responsible for the building design, and the building contractor is responsible for the quality of installation of the roof framing and plywood sheathing in accordance with IKO Industries Ltd instructions.
- 20.6 Building owners are responsible for the maintenance of IKO Asphalt Roof Shingles in accordance with the instructions of IKO Industries Ltd.



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Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2012 Plywood – Structural.
- AS/NZS 4680: 2006 Hot-dip galvanised [zinc] coatings on fabricated ferrous articles.
- ASTM D226 / D226M - 09 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- ASTM D3462 - 92 Standard Specification for asphalt shingles made from glass felt and surfaced with mineral granules.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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In the opinion of BRANZ, **IKO Asphalt Roof Shingles** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **IKO Industries Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **IKO Industries Ltd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **IKO Industries Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **IKO Industries Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

01 May 2020