CountyGutters

MUSTANG

Mustang® Seamless Aluminium Guttering System

TECHNICAL SUBMITTAL

MGMA METAL GUTTER MANUFACTURERS' ASSOCIATION

NBS Chorus

NBS Source PARTNER

BBA APPROVAL INSPECTION TESTING CERTIFICATION

Contents

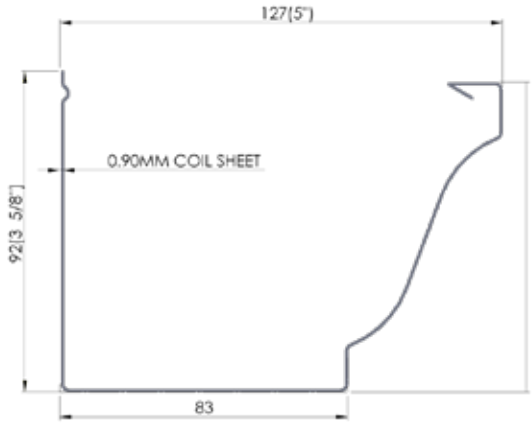
CountyGutters

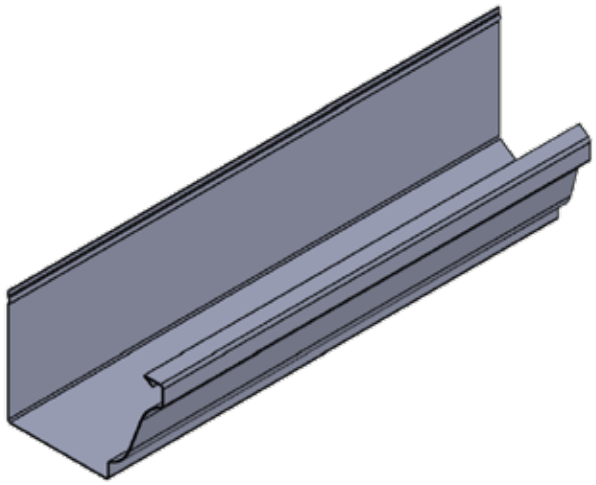
Introduction - Mustang® Seamless Guttering System

Mustang® Seamless Aluminium Gutter system is the only BBA certified seamless aluminium system available the UK. It is produced on site by a specialist roll forming gutter machine in lengths of up to 30m for a joint-free, leak-free solution.

With a life expectancy of over 30 years, Mustang gutters are safe, quick and easy to fit.

Most of the preparation is done at ground level before fixing at the roofline. This cuts down the amount of time working at height and disruption for customers.





Mustang gutters are made from 9mm aluminium coil - one of the most widely available elements in the world with incredibly low embodied carbon. Aluminium is non-corrosive, long lasting, requires little maintenance and can be easily and efficiently 100% recycled once it reaches the end of its useful life, unlike the plastic alternatives.

As part of its BBA approval, all Mustang installers must pass regular site inspections and audits ensuring a quality, leak-free fit. You can search for an approved Mustang installer near you on our website.

COLOUR OPTIONS

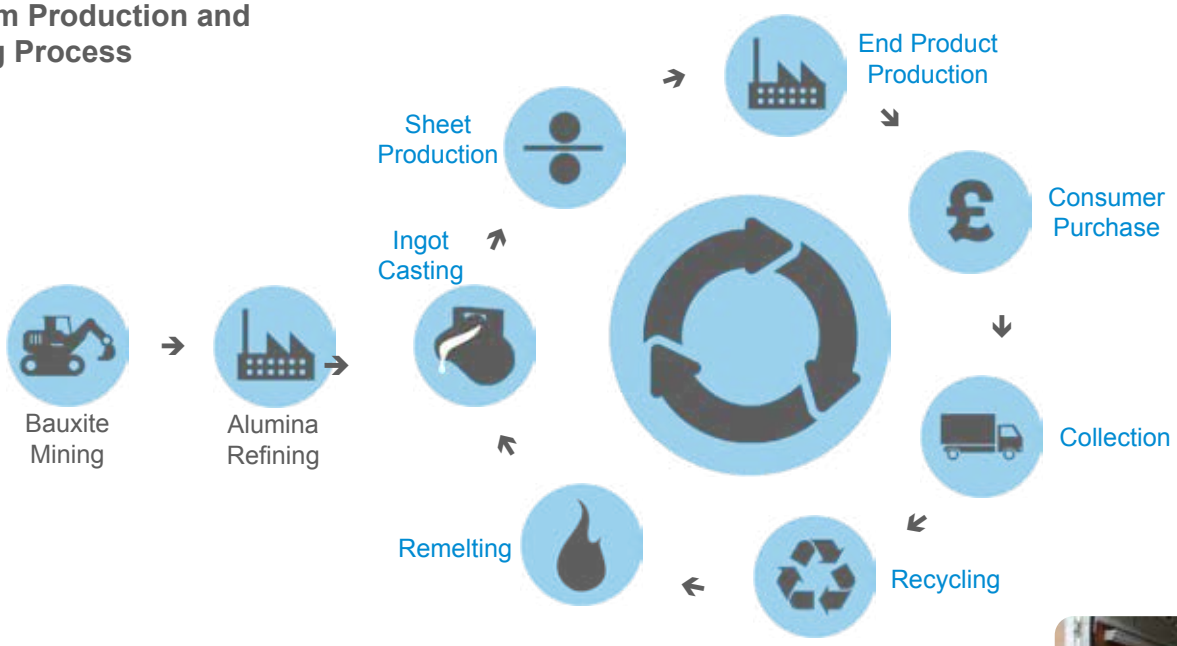
BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 91/2625

- RAL 9005 - Matt Black
- BS08B29 - Matt Brown
- RAL 9016 - Satin White
- RAL 7016 - Matt Anthracite
- RAL 7037 - Matt Grey
- Please contact ARP to discuss other colours

Environment/Sustainability

MUSTANG

Aluminium Production and Recycling Process



The only BBA Approved Seamless Aluminium Guttering System

View our Mustang® Video at https://youtube.com/@arpltd

Environment

Aluminium is one of the most readily available and sustainable materials used in construction today.

Aluminium produced today serves as a resource for the future. In Europe, the recycling rates for aluminium at the end of its life exceed 95% in both the automotive and construction industries.

The 0.9mm coil used to form Mustang® aluminium gutters contains at least 83% recycled material, with the balance consisting of re-melted aluminium ingots. Using recycled aluminium reduces the need for bauxite mining, saves one of the earth's natural resources and saves 95% of the energy requirements compared to metal made from raw materials.

On installation, the environmental benefits continue. Unlike other guttering systems, Mustang® is produced in continuous lengths to the exact dimensions of the building, meaning there is no waste. All components are wrapped in paper or woven bags and packed into cardboard boxes for despatch. Carbon emissions are limited to the initial installation.

Further maintenance will not be required once the seamless leak-free system has been commissioned.

Colonnade Downpipes

ARP's Colonnade aluminium downpipes are compatible with Mustang® gutters and are available in round, square, rectangular, and anti-vandal security profiles. Complimented by our unique swept bends, they form a complete, high-quality aluminium drainage system.

CountyGutters

How does Mustang compare to uPVC?

How does Mustang compare to other systems?

Mustang aluminium seamless guttering is a premium quality system, and over the last 35 years ARP has built up a network of established installers, who are fully approved and audited under the BBA certification for product credibility.

A number of local authorities and housing associations use Mustang seamless gutters as the product of choice for both the replacement of existing systems and new housing stock. The contracts in place involve many thousands of properties. Part of the decision-making process involves the economics of using Mustang against other products/materials and its viability within set financial budgets.

- Seamless aluminium guttering originated in the US and Canada in the 1960s and now accounts for around 70% of manufactured gutters in the US.
- Installation costs are comparable to uPVC, enhancing the economic viability of Mustang seamless gutters.
- Ground-level bracket fitting and the lightweight nature of aluminium reduce installation costs and time spent working at height.
- Mustang gutters have a functional life expectancy of 30 years compared to the limited lifespan of uPVC.
- The sustainable credentials of aluminium make it an attractive choice.

Fire Performance

A classification used in the building industry is given by EN 13501, a Euroclass system recognised as the standard of fire safety across Europe. The designations are:

1. How much a material contributes to the behaviour of fire

A1 = non-combustible materials
A2 = non-combustible (Scotland) and limited combustibility (England and Wales)
B, C, D = ranges from very limited to medium contribution to fire
E, F = high contribution to fire

2. Smoke Development (10 mins of exposure to fire)

S1 = little or no smoke
S2 = quite a lot of smoke
S3 = substantial/heavy smoke

3. Formation of Flaming Droplets/Particles (10 mins of exposure to fire)

D0 = no droplets
D1 = some droplets
D2 = quite a lot

A2-s1,d0

This means:

A2 - Limited combustibility - no contribution to fire

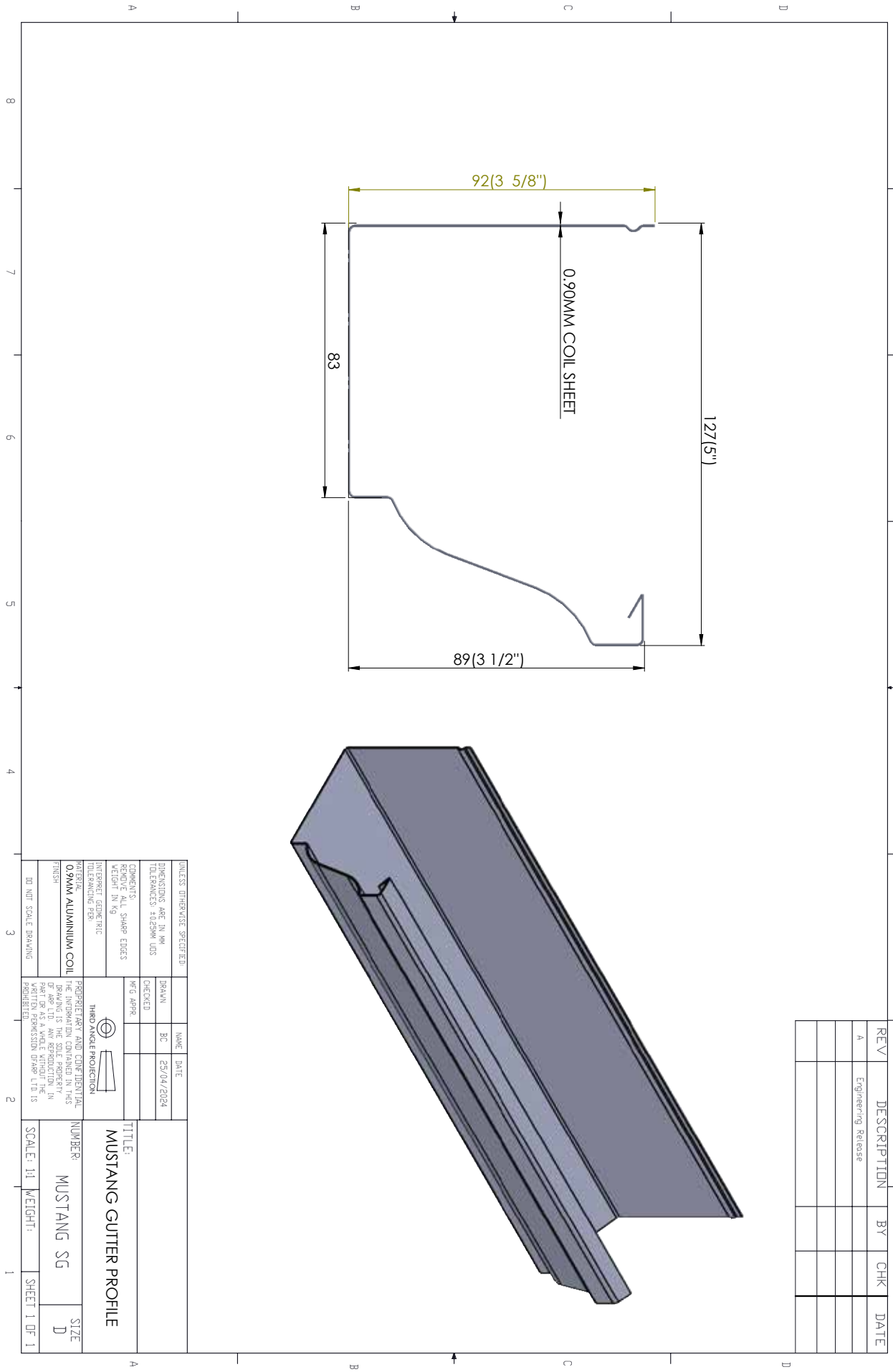
s1 - Lowest level for smoke emissions

d0 - Lowest level for flaming droplet/particles

Aluminium as a material has a melting point range from approximately 550°c—660°c dependent on its purity and alloy state. Aluminium metal and all its alloys, in both solid and molten states, including all products forms, wire, extrusion, sheet and foil, are “non-combustible”, meaning they do not burn or combust when exposed to fire. Solid Aluminium is a non-combustible material and therefore inflammable, so cannot catch fire. It is the coating that is a requisite for a fire rating and to which the above grading has been achieved.

Mustang® Components

DXF and DWG files are available for all components.



DXF and DWG files are available for all components.

Mustang® Components

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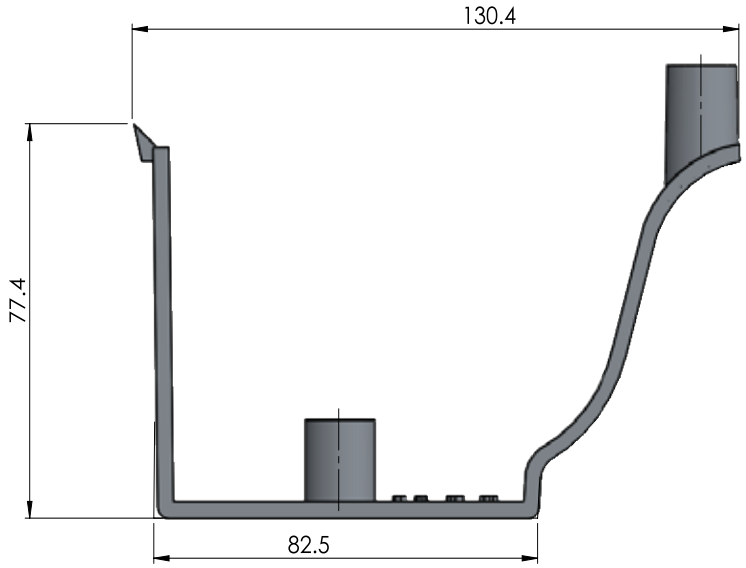

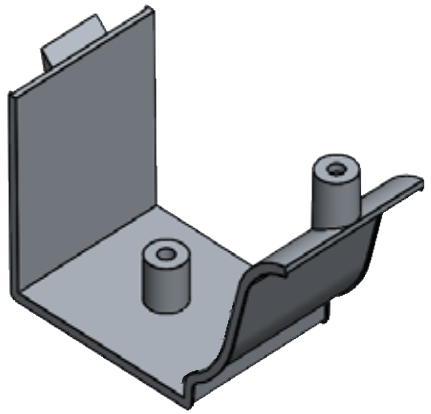

SIZE
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DO NOT SCALE DRAWING

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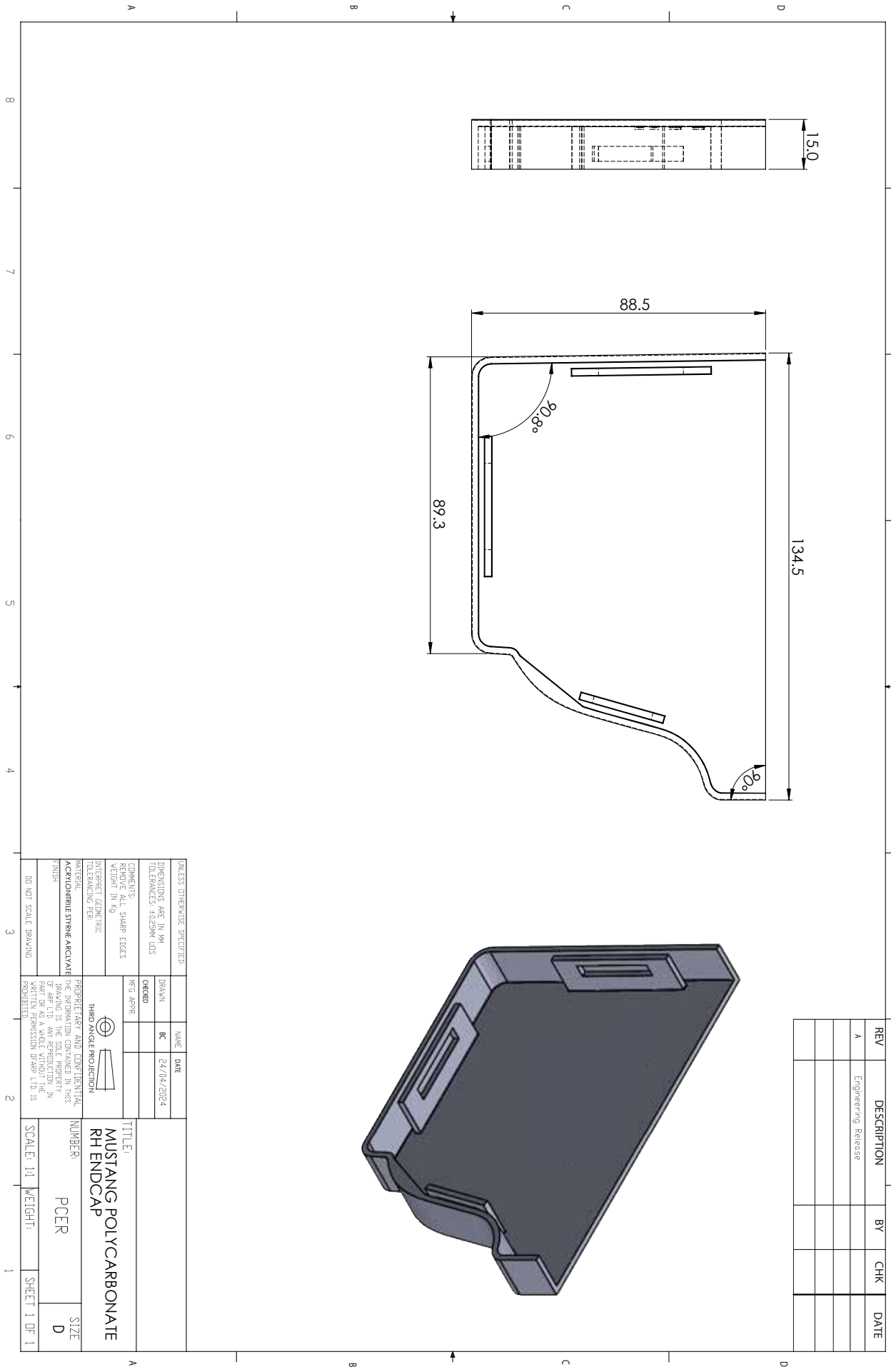
NOT FOR MANUFACTURE

DXF and DWG files are available for all components.



Mustang® Components

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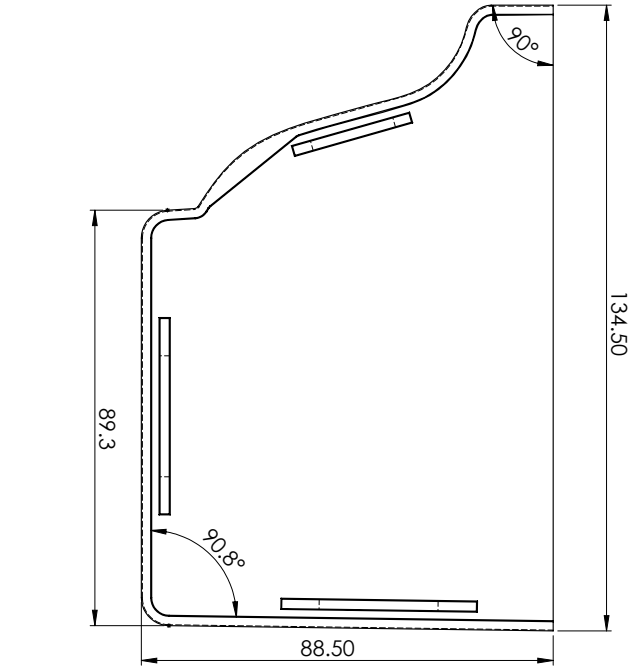

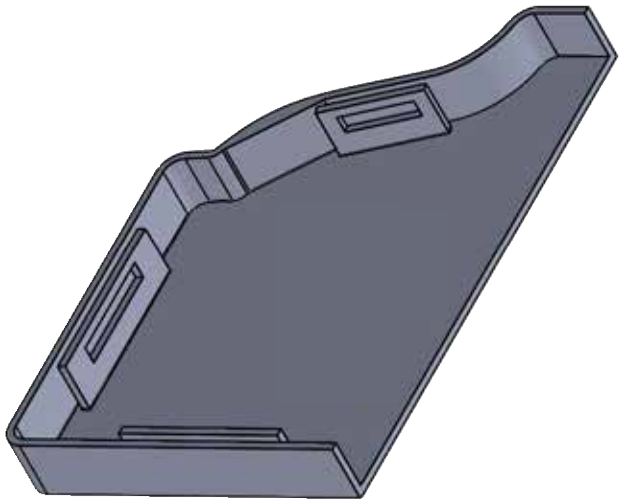

REV	DESCRIPTION	BY	CHK	DATE
A	Engineering Release			

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COMMENTS:
REMOVE ALL SHARP EDGES
WEIGHT IN Kg
INTERPRET GEOMETRIC
TOLERANCING PER:

	NAME	DATE
DRAWN	BC	
CHECKED		
MFG APPR.		

THIRD ANGLE PROJECTION

MATERIAL:
ACRYLONITRILE STYRENE ACRYLATE
FINISH

DO NOT SCALE DRAWING

TITLE:
MUSTANG POLYCARBONATE
LH ENDCAP

NUMBER:
PCEL

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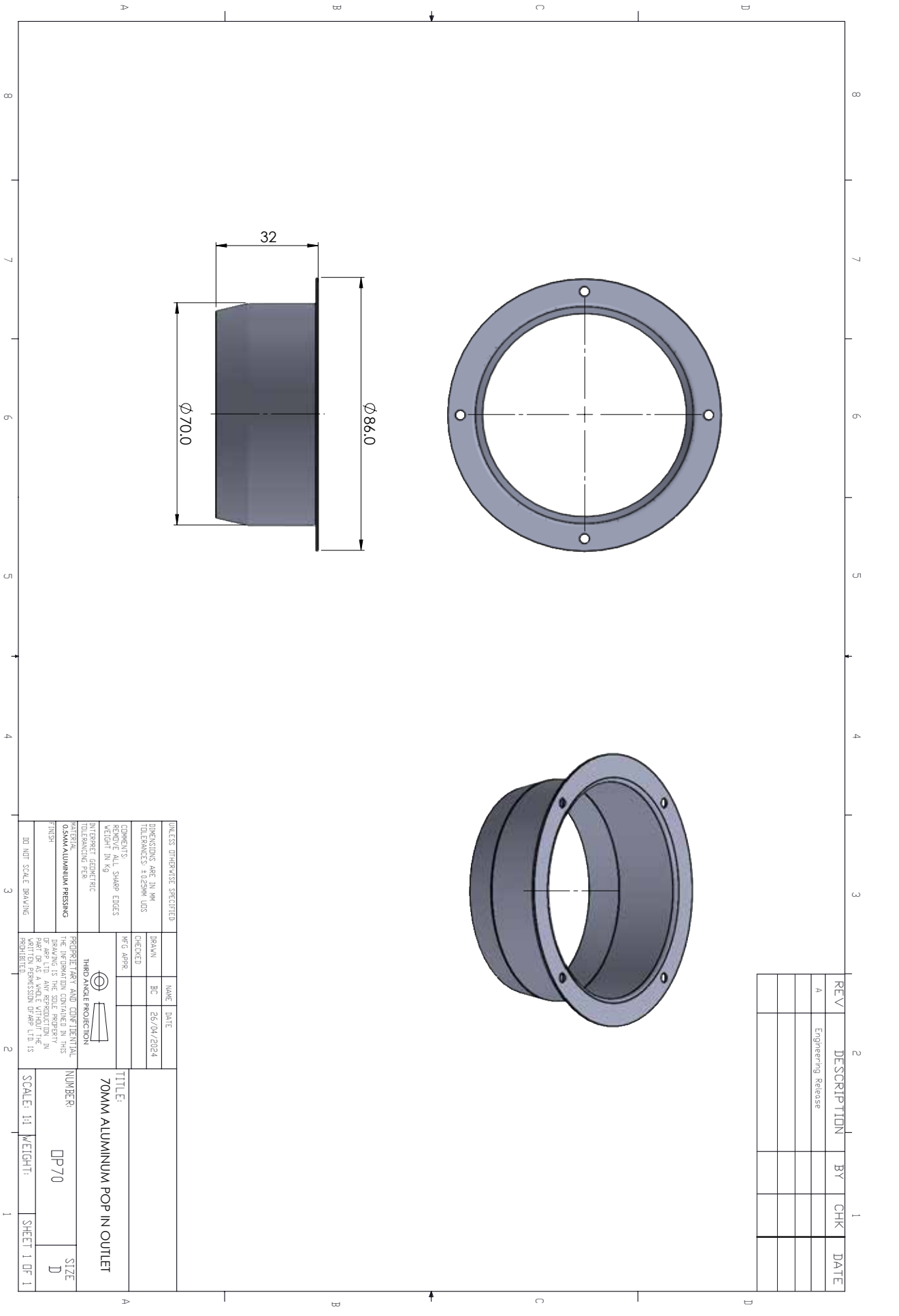
SCALE: 1:1 WEIGHT:
SHEET 1 OF 1

Mustang® Components

DXF and DWG files are available for all components.



Mustang® Components

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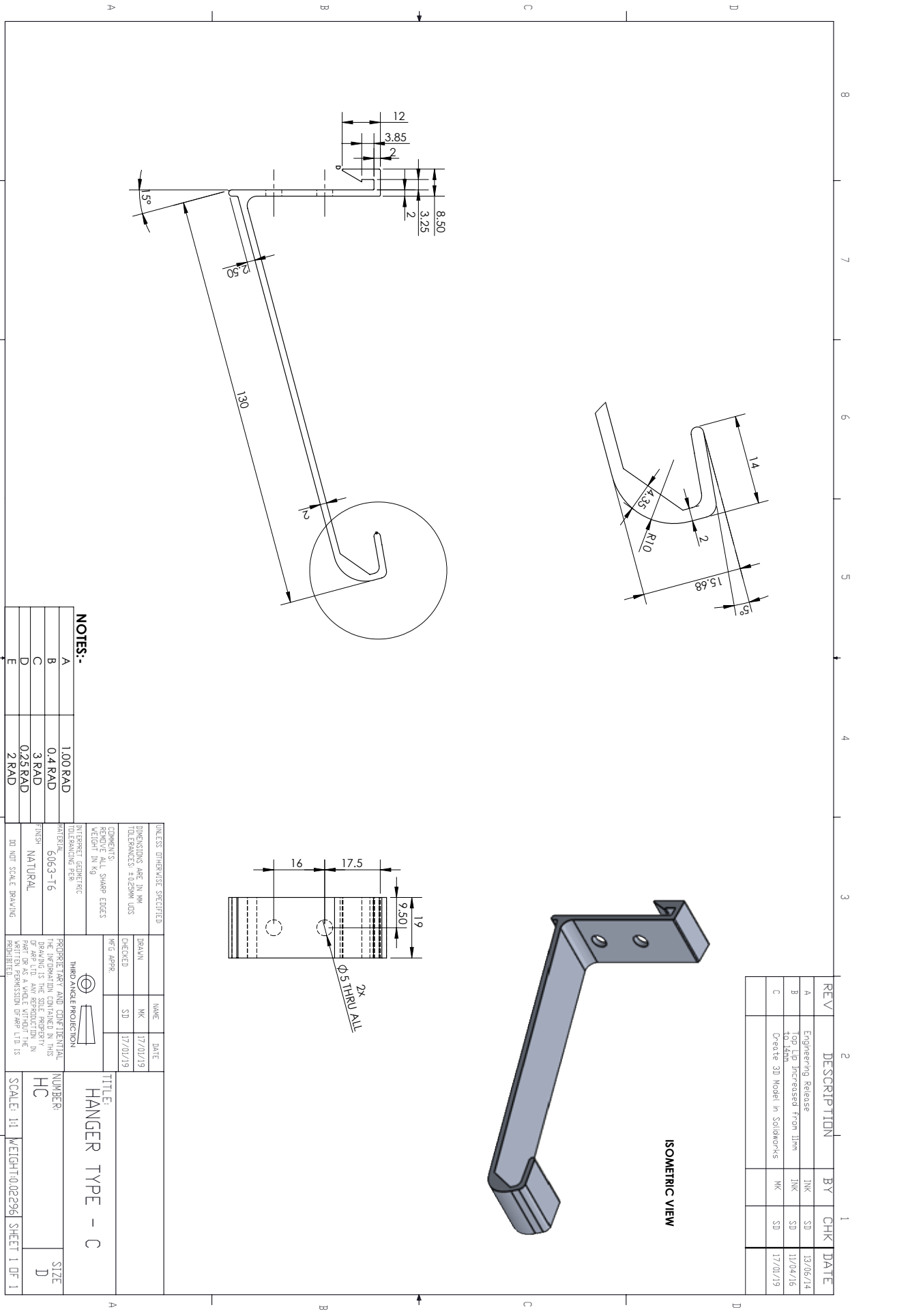

Mustang® Components

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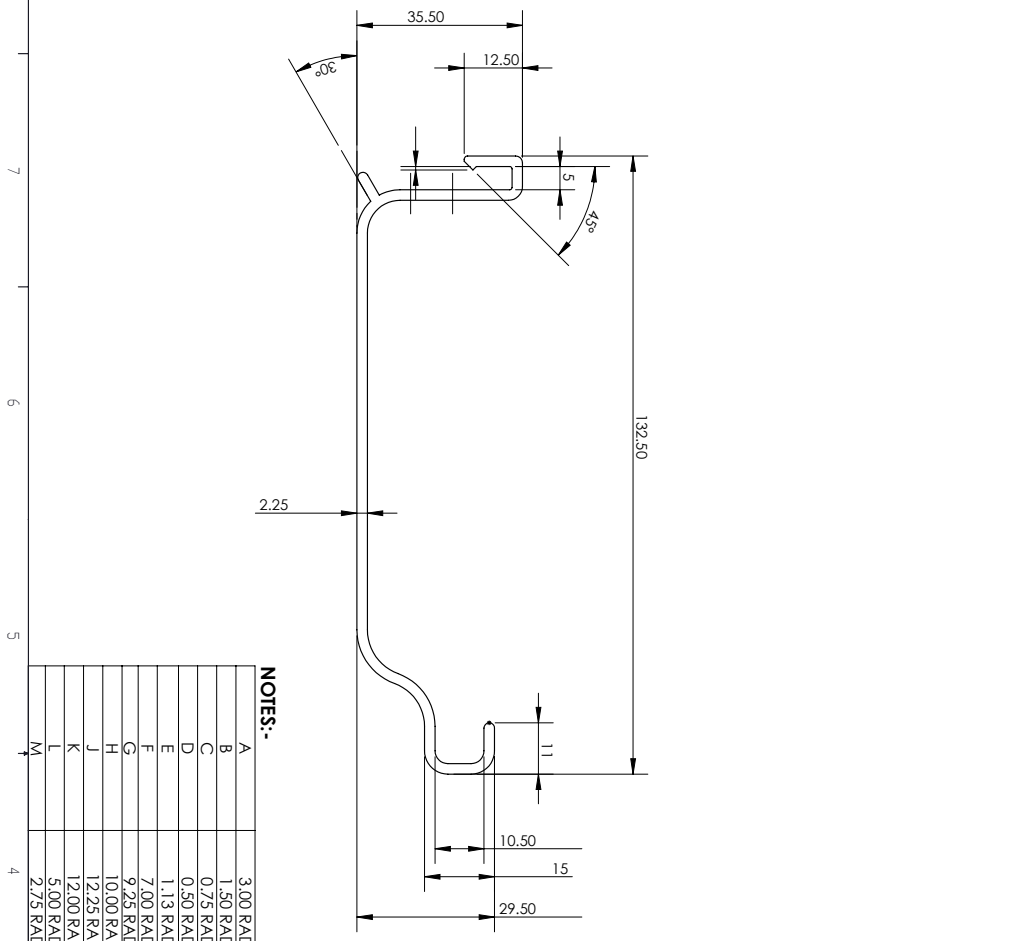

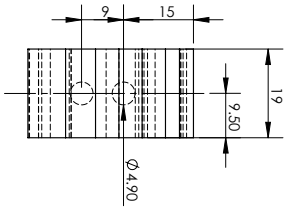

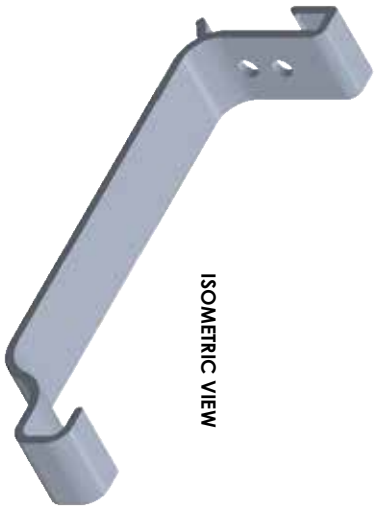

ISOMETRIC VIEW

REV	DESCRIPTION	BY	CHK	DATE
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B	Created 3D model in Solidworks	MK	SD	02/01/19

NOTES:-

A	3.00 RAD
B	1.50 RAD
C	0.75 RAD
D	0.50 RAD
E	1.13 RAD
F	7.00 RAD
G	9.25 RAD
H	10.00 RAD
J	12.25 RAD
K	12.00 RAD
L	5.00 RAD
M	2.75 RAD

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM
TOLERANCES ±0.25MM UOS
COMMENTS:
REMOVE ALL SHARP EDGES
WEIGHT IN Kg
INTERPRET GEOMETRIC TOLERANCING PER

MATERIAL 6063-T6
FINISH NATURAL

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

	NAME	DATE
DRAWN	MK	02/01/19
CHECKED	SD	02/01/19
MFG APPR		

TITLE:
HANGER TYPE - A

NUMBER:
HA

SIZE
D

SCALE: 1:1 | WEIGHT:0.02303 | SHEET 1 OF 1

Mustang® Components

DXF and DWG files are available for all components.

REV	DESCRIPTION	BY	CHK	DATE
A	Engineering Release			

FINISH

DO NOT SCALE DRAWING

SCALE: 1:1 WEIGHT: 140.13 SHEET 1 OF 1

NOT FOR MANUFACTURE

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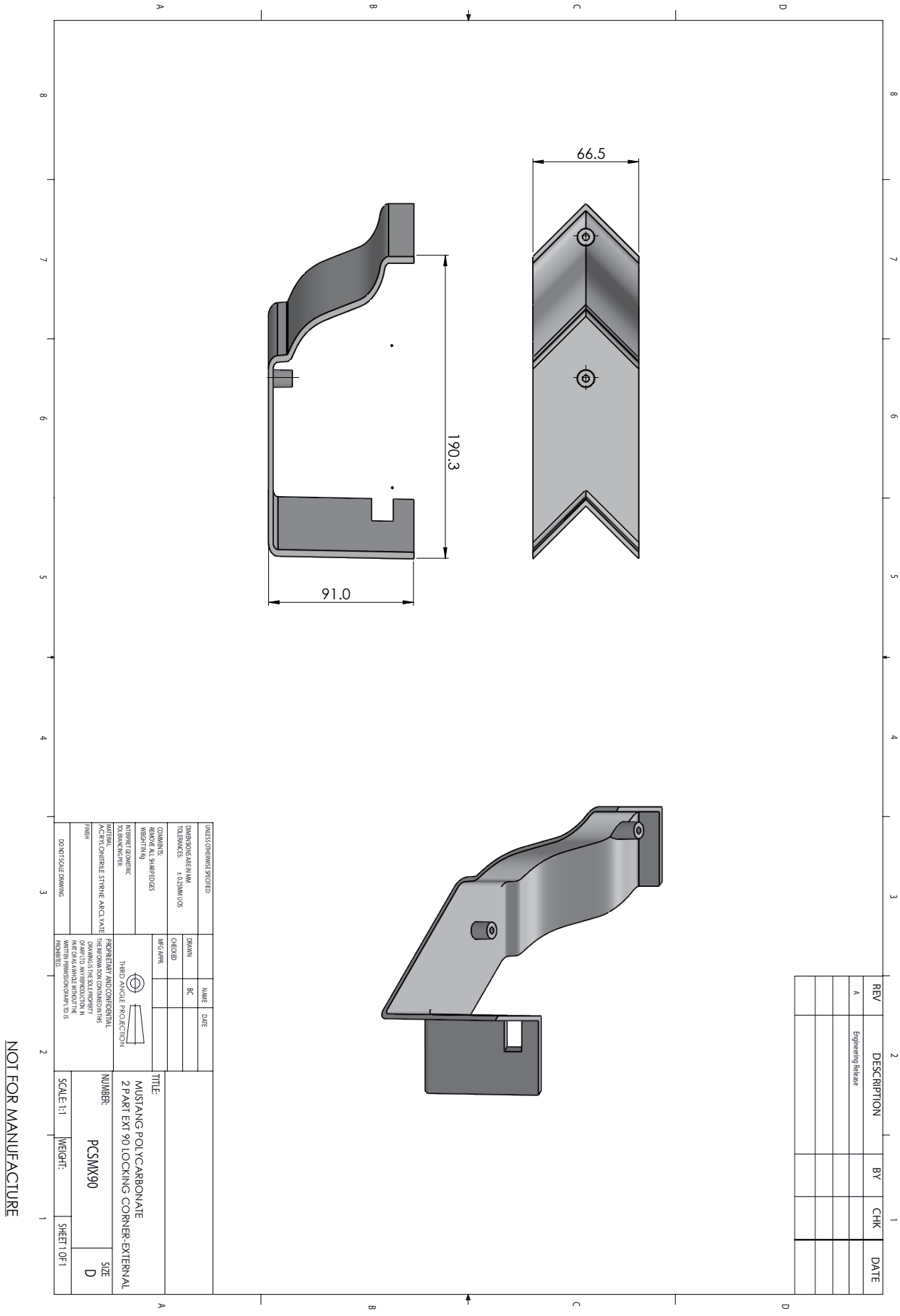

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Mustang® Components

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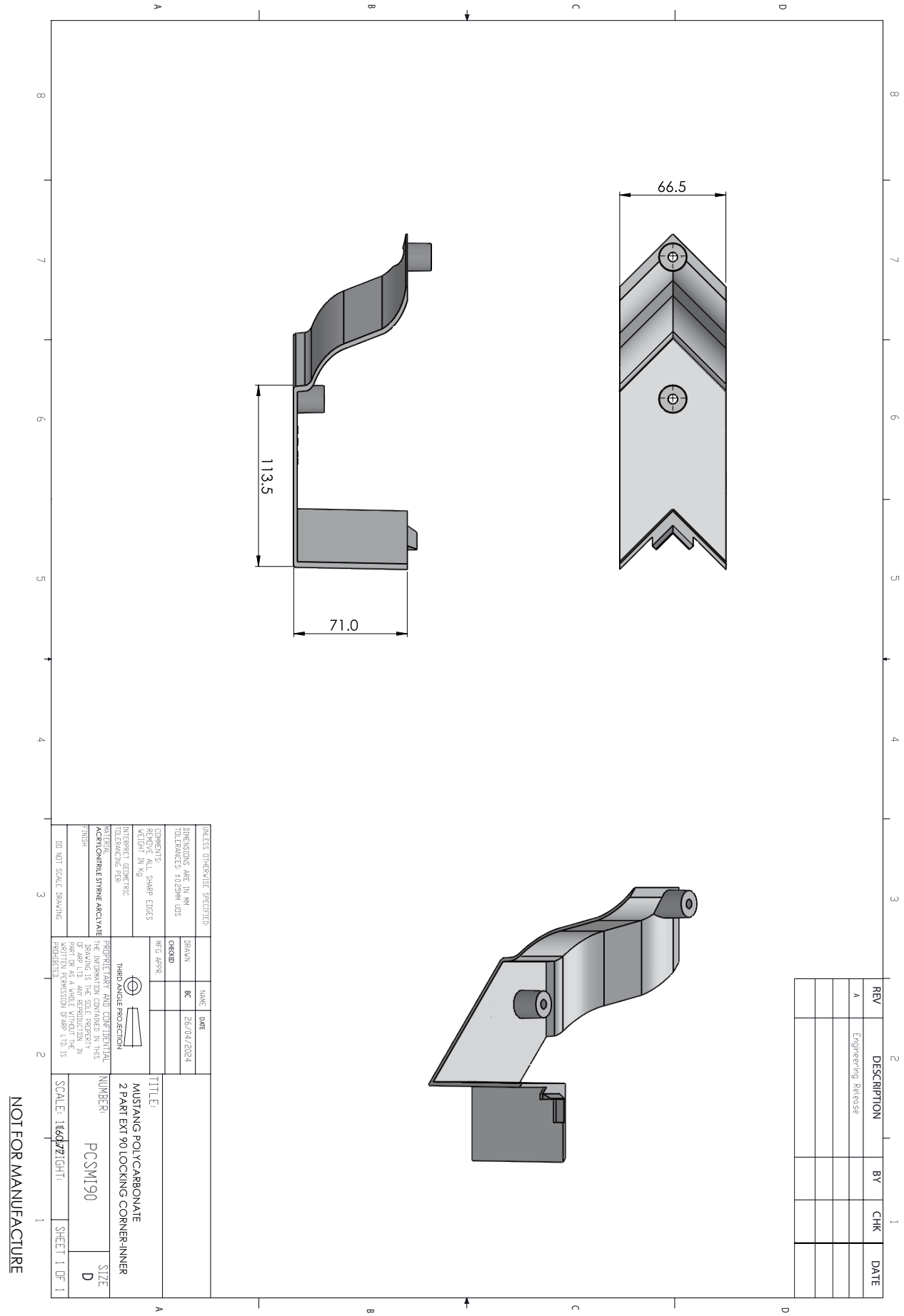

NOT FOR MANUFACTURE

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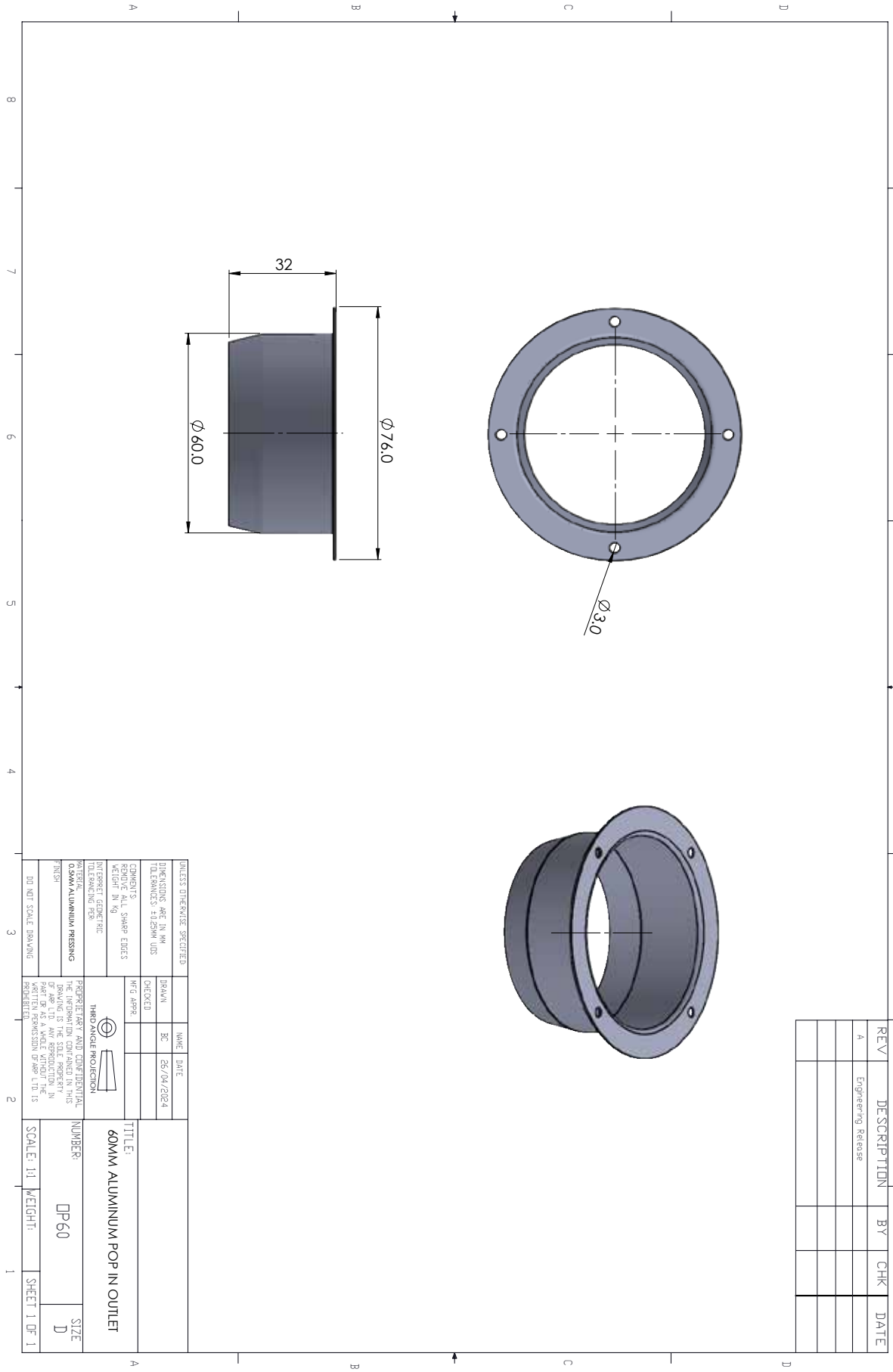


British Board of Agrément Certificate

Aluminium Roofline Products Ltd
Unit 2, Vitruvius Way
Meridian Business Park
Braunstone
Leicester LE19 1WA

Tel: 0116 289 4400 Fax: 0116 289 4433

Agrément Certificate
91/2625
Product Sheet 1

ALUMINIUM ROOFLINE PRODUCTS GUTTERING SYSTEMS

MUSTANG GUTTER AND ACCESSORIES

This Agrément Certificate Product Sheet(1) relates to Mustang Gutter and Accessories, an eaves gutter system comprising coated aluminium gutter lengths, fixing hangers and ancillary items, for use as collection and discharge of rainwater from pitched roofs.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Performance of joints — joints between gutter sections and fittings are watertight under conditions of thermal movement in excess of those expected to occur in practice (see section 6).

Resistance to loading — gutters have adequate resistance to snow loading (see section 7).

Flow characteristics — the gutter system provides adequate flow capacities (see section 8).

Durability — the system will have a life expectancy of at least 30 years (see section 10).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 12 May 2020

Originally certificated on 27 March 1991

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Mustang Gutter and Accessories, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**H3**	**Rainwater drainage**
Comment:		The system will carry the flow of rainwater from the roof to an outfall and minimise the risk of blockage or leakage. See section 8 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 10 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The system satisfies this Regulation. See sections 9.1, 9.2 and 10 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building Standards applicable to construction**
Standard:	3.6	Surface water drainage
Comment:		The system satisfies the relevant requirements of this Standard, with reference to clause 3.6.1(1). See section 8 of this Certificate.

(1) Technical Handbook (Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)(iii)(b)**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	**82**	**Rainwater drainage**
Comment:		The system will contribute to satisfying the relevant requirements of this Regulation. See section 8 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

In the opinion of the BBA, there is no information in this Certificate which relates to the obligations of the client, designer (including Principal Designer) and contractor (including Principal Contractor) under these Regulations.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, Mustang Gutter and Accessories, if installed and used in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Part 7 *Roofs,* Chapters 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs, Part 7.2.22*.

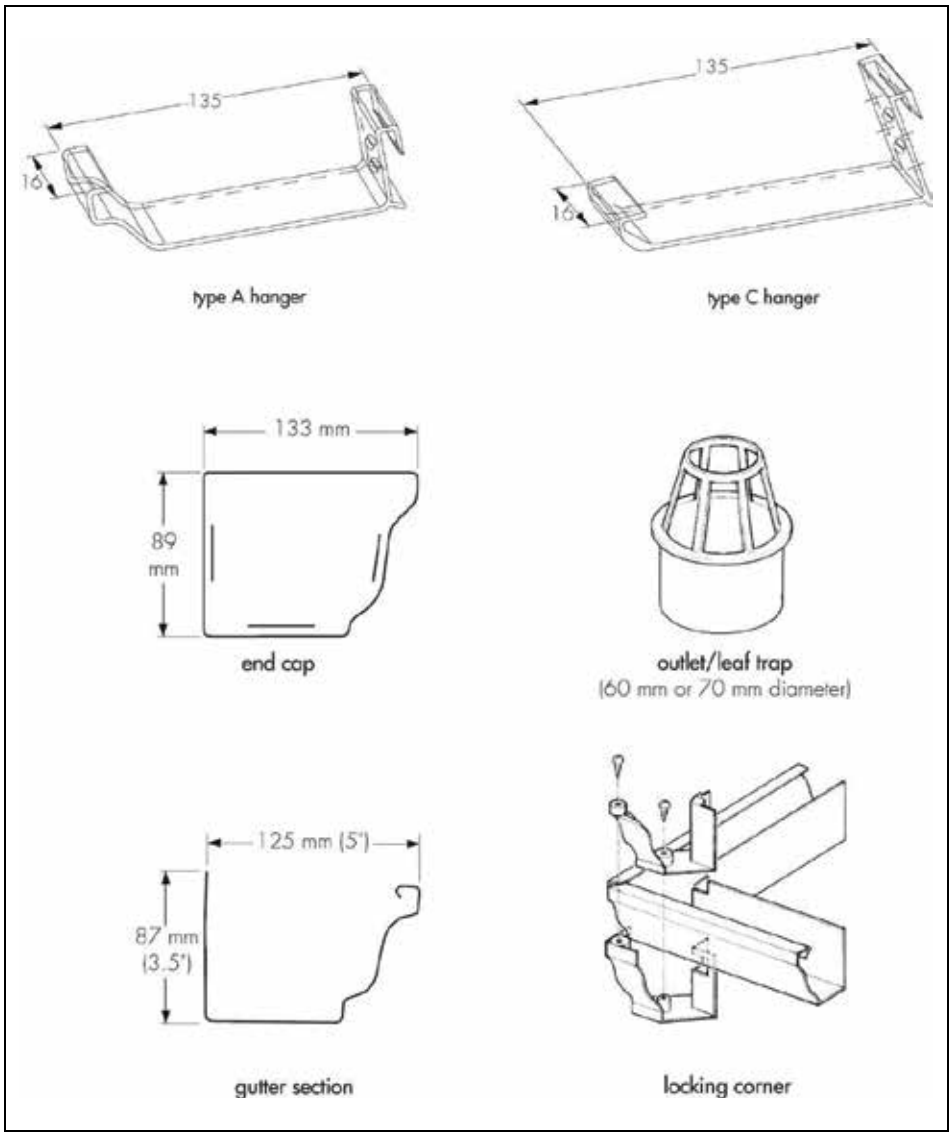
Technical Specification

1 Description

1.1 Mustang Gutter and Accessories is an eaves guttering system comprising (see Figure 1 and Table 1):

- gutter — 0.9 mm thick, 125 mm wide by 87 mm deep aluminium ogee profile, available in lengths of up to 30 m, with a 25 µm total thickness coating of primer/ polyester, primer/polyvinylidene fluoride/acrylic, or primer/polyamide-modified polyester
- fixing hangers A and C — 16 mm wide extruded mill finish aluminium, either 2.25 mm (A) or 2 mm (C) thick, secured using stainless steel screws
- end caps — polycarbonate, snap-fitted to gutter end and sealed
- outlets/leaf traps — 60 or 70 mm diameter, aluminium or low-density polyethylene (LDPE) with UV stabilisers, with pre-formed hole for fixing
- locking corners and connector/expansion joints — two-part polycarbonate fittings, sealed and fastened with stainless steel screws (see section 1.3)
- sealant — silicone sealant for use between gutter joints, end caps, outlets and corner pieces.

Figure 1 Some system components



1.2 The gutters, end caps, locking corners and connector/expansion joints are available in black (RAL 9005), brown (BS08B29), dark grey (RAL 7016), grey (RAL 7037) or white (RAL 9016).

1.3 Also used with the system, but outside the scope of this Certificate, are M4 by 30 mm long A2 stainless steel screws, used with the corner fitting pieces.

Table 1 Product range

Description	Product code
300mm wide 0.9mm coil	CL8C900
External 90° corner	PCSMX90
Internal 90° corner	PCSMI90
External 135° corner	PCSMX135
Non-Standard Angle Corners	available on request
Straight Connector	PCCCS
Left Hand Endcap	PCECL
Right Hand Endcap	PCECR
Hanger Type A	HA
Hanger Type C	HC
60mm Outlet	OP60
70mm Outlet	OP70
60mm Leaftrap Outlet	PLT60
70mm Leaftrap Outlet	PLT70
Arbosil 1096 Silicone Sealant	SA96

2 Manufacture

2.1 The gutter is manufactured on site by roll-forming continuous lengths from coated aluminium coil pre-cut to width into the predetermined ogee shape. The fixing support brackets, end caps, outlets, locking corners and connector/expansion joints are bought-in to an agreed specification.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Reasonable care should be taken to avoid damage during storage, handling and installation.

3.2 The system components are separated with paper, boxed and labelled.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Mustang Gutter and Accessories.

Design Considerations

4 Use

4.1 Mustang Gutter and Accessories are satisfactory for use as eaves guttering for conveying rainwater from pitched roofs to suitable outlets. It is important to ensure that fascia board or fixing background is in good and secure condition.

4.2 The gutter is for use with downpipes and fittings complying with BS EN 12200-1 : 2016 and BS EN 1462 : 2004.

4.3 Slight undulation in the external face of the gutter may be evident, particularly if the facing is uneven or where dark-coloured gutters are exposed to direct sunlight. This will not affect the serviceability of the gutter.

5 Practicability of installation

The system is designed to be installed only by installers who have been trained and approved by the Certificate holder.

6 Performance of joints

Joints between adjacent gutter sections made in accordance with this Certificate are watertight under conditions of thermal movement in excess of those expected to occur in practice.

7 Resistance to loading

The gutter system has adequate resistance to impacts, snow, water and other loads likely to occur during and after installation.

8 Flow characteristics

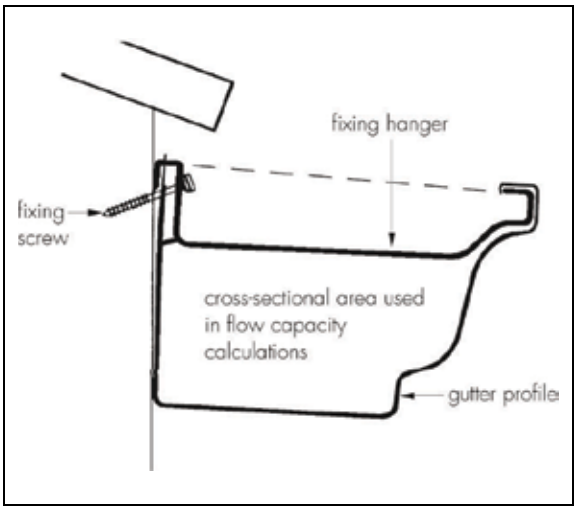
The flow capacities, when calculated in accordance with BS EN 12056-3 : 2000, are given in Table 2 of this Certificate.

Table 2 Free flow capacities

Component	Flow capacity ($l \cdot s^{-1}$)
Gutter(1)	2.33
Outlet	
60 mm	1.56
70 mm	2.12

(1) Section properties based on Figure 2.

Figure 2 Flow capacity



9 Maintenance

9.1 The gutter can be readily cleared of debris (eg leaf litter).

9.2 Installed correctly, the gutter joints will be maintenance-free. However, if accidentally damaged, joints can be replaced or slackened, resealed and re-assembled

9.3 Where the gutter is damaged along the length in the centre position, the damaged portion can be removed and a new length inserted by the use of the connector/expansion joints.

10 Durability

10.1 The system will have a life expectancy of at least 30 years.

10.2 The performance of the coatings will depend upon the specification, colour chosen, and the environment, location and aspect face. It will retain a good appearance for at least 15 years in non-corrosive environments, and at least 10 years in severe industrial environments.

10.3 The coated aluminium performs satisfactory in all normal atmospheric conditions (including coastal and industrial, but excluding the immediate vicinity of, and downwind from, sources of abnormal corrosive contaminants, such as chemical works, cement works and copper foundries).

10.4 A planned maintenance cycle can be introduced if an extended design life is required.

11 Reuse and recyclability

The gutter and fixing hanger components are made from aluminium, which can be recycled.

Installation

12 General

12.1 Installation must be carried out by approved installers trained by the Certificate holder. The installation must be in accordance with BS EN 12056-3 : 2000 when applicable.

12.2 The system is fabricated to the specification for the particular installation.

13 Procedure

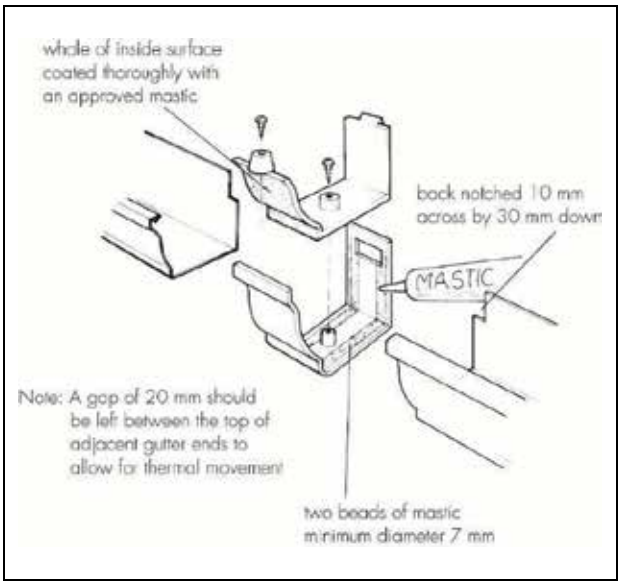
13.1 Downpipes are positioned and marks corresponding to their centres are made on the fascia board. An exact measurement is taken of the length of gutter required, noting the marked positions of the downpipes. An initial 1 m length of the gutter section is roll-formed and an end cap fitted. Silicone sealant is used to seal the joint and roll-forming continues in 5 metre increments, pausing to clip in aluminium fixing brackets at centres not exceeding 450mm before continuing roll-forming to the required length. The formed gutter is cut to length and an endcap fitted to the other end.

13.2 Corners are formed by mitring the ends of the gutter lengths and the installation of a two-piece polycarbonate locking corner fitting sealed with silicone sealant and held together with stainless steel screws.

13.3 Provision for expansion to take place is necessary in gutters in excess of 30 m in length. Connector/expansion joints are installed in the same manner as the corner fittings (see Figure 3).

13.4 At the required downpipe positions, a hole is cut using a cylindrical metal cutter into the base of the gutter, an outlet or leaftrap outlet is fitted and silicone sealed. The gutter is positioned at the required height and fixed with stainless steel screws, located in the pre-drilled holes in the fixing hangers and driven horizontally through the back of the gutter into the prepared fascia.

Figure 3 Connector/expansion joint



Technical Investigations

14 Tests

14.1 Tests were conducted and the results assessed to determine:

- watertightness of joints
- resistance of gutter to loading
- performance of expansion joints
- effect of temperature on 30 m length of gutter.

14.2 An assessment of data was made in relation to:

- impact resistance
- dimensional accuracy
- flow capacity
- ease of cleaning

- thermal movement.

15 Investigations

15.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

15.2 Site visits were carried out to assess the practicability of installation and the performance in use.

Bibliography

BS EN 1462 : 2004 *Brackets for eaves gutters — Requirements and testing*

BS EN 12056-3 : 2000 *Gravity Drainage Systems inside Buildings — Roof drainage, layout and calculation*

BS EN 12200-1 : 2016 *Plastics rainwater piping systems for above ground external use — Unplasticized poly(vinyl chloride) (PVC-U) — Specifications for pipes, fittings and the system*

Conditions of Certification

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

16.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

16.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

16.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

16.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

ver1 2015

epd-norway
Global Program Operator

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Speira AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-4044-3080-EN
Registration number:	NEPD-4044-3080-EN
ECO Platform reference number:	-
Issue date:	30.12.2022
Valid to:	30.12.2027

Mill-finish & coil coated aluminium rolled products - Scrap containing alloys

Speira AS, Holmestrand

speira

www.epd-norge.no

Environmental Product Declaration - Aluminium Coil

General information

Product:
Speira AS mill-finish and coil coated aluminium rolled products based on scrap containing alloys, with average 40 % post-consumer scrap.

Program operator:
The Norwegian EPD Foundation
Pb. 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:
NEPD-4044-3080-EN

ECO Platform reference number:

This declaration is based on Product Category Rules:
CEN Standard EN 15804 serves as core PCR
NPCR 013, "Version 3.0 Part B for steel and aluminium construction products"

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturerinformation, life cycle assessment data and evidences.

Declared unit:
1 kg of Speira mill-finish and coil coated aluminium rolled products, scrap containing alloys, produced in Holmestrand.

Declared unit with option:
1 kg of Speira mill-finish and coil coated aluminium rolled products, scrap containing alloys, produced in Holmestrand, including waste handling and possible environmental benefits after end-of-life.

Functional unit:
The product is an input to several products. No use scenarios are defined, hence no functional unit.

Verification:
The CEN Norm EN 15804 serves as the core PCR.
Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☒ external

Third party verifier:
Jane Anderson

Jane Anderson, ConstructionLCA Ltd
(Independent verifier approved by EPD Norway)

Owner of the declaration:
Speira AS
Contact person: Tom Muggerud
Phone: +47 90 60 21 63
e-mail: tom.muggerud@speira.com

Manufacturer:
Speira AS
Weidemannsgate 8, N-3080 Holmestrand
e-mail: greener.rmh@speira.com

Place of production:
Holmestrand

Management system:
ISO 14001, ISO 9001

Organisation no:
975 934 578

Issue date:
30.12.2022

Valid to:
30.12.2027

Year of study:
2020

Comparability:
EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

The EPD has been worked out by:
Irmeline de Sadeleer, Andreas Brekke, Kari-Anne Lyng, Gaylord K. Booto

Approved
Håkon Hauan
Managing Director of EPD-Norway

Environmental Product Declaration - Aluminium Coil

Product

Product description:
This EPD covers mill-finish and coil coated aluminium rolled products, with average 40% post-consumer scrap. It is valid for flat rolled products (coil, sheet and strip).

Exampe of applications:
Examples of market sectors: Building and Construction, General Engineering, Automotive and Transportation, Consumer Goods, Domestic Applliances and Food Packaging.

Product specification:
Typical content of the Aluminium Product:

Materials	kg	%
Post-consumer scrap	0.40	39 %
Process scrap	0.44	42 %
Primary metal from external sources	0.19	18 %
Alloying elements	0.015	1.4 %

Technical data:
Our scrap containing alloys in the 3000-series have been developed by Speira Holmestrand since the early 1990's.
We offer flat rolled products in three alloys with an approximate average of 40% post-consumer scrap (based on previous production years): EN AW-3005; EN AW-3005A and EN AW-3105B.

Both alloys offer excellent fomability, strength and corrosion resistance.

For more information, contact your local Speira sales office or go to https://www.speira.com or https://www.speira.com/sales-requests/

Typical material properties
Mechanical properties vary according to the specific thermo-mechanical processing. Alloy and temper should be specified according to norms EN 573-3 and EN 515. The properties are specified according to EN 485-2 or EN 1396. Specific customer requirements can also be agreed upon in discussion with our technical team.
Technical data sheets can be provided by our sales team. Our team of technical experts is ready to help you choose the right alloy and temper.

Reference service life, product:
Depends on product application, but the material itself has an infinte life time.

Market:
Global

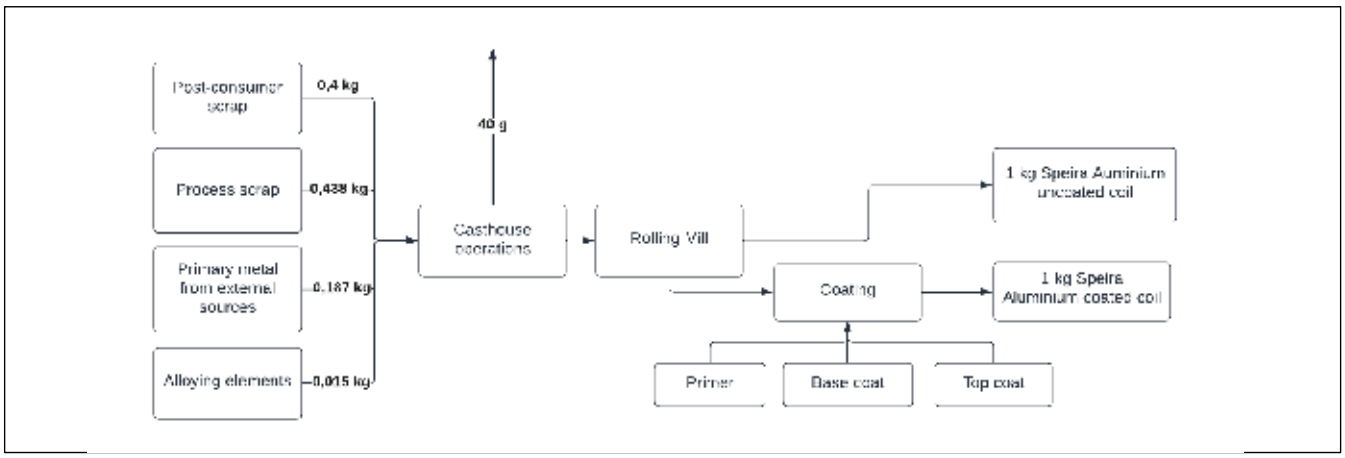
Environmental Product Declaration - Aluminium Coil

LCA: Calculation rules

Declared unit:
1 kg of Speira aluminium containing average 40% post-consumer scrap product. The EPD also covers modules C2-C4 and D.
The Speira aluminium scrap containing product is produced in Holmestrand. The results are based on the production volumes of 2019.

System boundary:
Cradle to gate with options. The following stages have been declared: A1-A4, C2-C4 and D. Further specificed in flow sheet below.

Module D covers the potential benefits from recycling of Speira aluminium after end-of-useful-life. Module D covers all necessary stages from C3 until the aluminium is back to the market and compares to the environmental performance of an average market forge ingot. The module is further specified under scenarios.



Data quality:
Specific data were used for all of Speira's processes, based on the production year 2019, and were collected for the entire year 2019. Background data on for instance transport and electricity production are from ecoinvent 3.6 (2020).

Cut-off criteria:
All major raw materials and all the essential energy flows were included. The production processes for raw materials and energy flows with very small amounts (<1%) were not included in this analysis. This cut-off rule does not apply to hazardous materials and substances, but mostly to alloying elements that are added in less than per thousandth.

Allocation:
The allocation is made in accordance with the provisions of EN 15804. Incoming energy, water and waste production inhouse are allocated equally among all products through mass allocation. For almost all processes, detailed data are provided for each step, and the main allocation is done between aluminium hydroxide and aluminium oxide in the production of alumina. Effects of primary production of recycled materials are allocated to the main product in which the material was used. The recycling process and transportation of the material are allocated to this analysis.

LCA: Scenarios and additional technical information

The following information describes the scenarios in the different modules of the EPD.

The transport from the Holmestrand production site to the average customer location in Europe, is based on a combination of lorry, ship, and train. The average distance is 1220 km split among the three transport modes according to the average use of each one.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption
Truck	50	Lorry, >32 metric tons, Euro V	899	1.6E-02 l/tkm
Boat	80	Cargo ship, 5000 tons	168	1.1E-02 l/tkm
Train	50	Freight train	153	0.30 ML/tkm

Collection rates:
The aluminium is supplied predominantly to four different markets with different market shares to each of them. The four markets are: Construction (96%), Automotive (95%), Household appliances (75%), and Packaging (65%). The numbers in parentheses are collection rates found by European Aluminium for the different markets. Due to the different market shares, the resulting average collection rate is 92.6%. Aluminium that is not collected for recycling is assumed to go to either incineration or landfill. A 50/50 split is employed. In the handling phase (sorting and shredding), there is another loss of 2.7% of the stream going to recycling.

End-of-Life (C2, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	-
Collected	kg	0.926
Re-use	kg	-
Recycling	kg	0.901
Energy recovery*	kg	0.037
To landfill**	kg	0.064

* 37 grams of the original 1 kg of aluminium is going to incineration. No loads or beneifts are attribuded to this flow.

**There will be a small portion of aluminium ending as uncollected. This is included under "To landfill" where no loads or benefits are included.

Transport to waste processing (C2)

Type	Capacity utilisation (incl.	Type of vehicle	Distance km	Fuel/Energy
Truck	40	Lorry, >32 metric tons, Euro V	269	2.4E-02 l/tkm
Boat	80	Sea, transoceanic ship	471	1.2E-02 l/tkm

Aluminium from the shredder to waste handling site is assumed to be transported in an older medium-sized lorry with smaller capacity utilization than in the production system.

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Primary aluminium to recycling	g	501

Aluminium collected and recycled is assumed to replace an average aluminium product in Europe consisting of 40% recycled and 60% primary aluminium. This is a conservative approach.

Environmental Product Declaration - Aluminium Coil

LCA: Results

All results are calculated with the use of SimaPro v.9 (2019) and impact methods according to ISO 15804.

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assemby stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x

Environmental impact

Parameter	Unit	A1-A3 (uncoated)	A1-A3 (coated)	A4	C2	C3	C4		D
GWP	kg CO_2-eqv	3.35E+00	3.60E+00	9.00E-02	7.79E-03	2.38E-01	0.00E+00		-2.86E+00
ODP	kg CFC11-eqv	2.40E-07	4.09E-07	1.74E-08	1.39E-09	9.06E-09	0.00E+00		-2.26E-07
POCP	kg C_2H_4-eqv	1.90E-03	2.17E-03	1.38E-05	1.06E-06	3.21E-05	0.00E+00		-1.40E-03
AP	kg SO_2-eqv	2.47E-02	2.55E-02	3.56E-04	3.06E-05	6.80E-04	0.00E+00		-1.65E-02
EP	kg PO_4^{3-}-eqv	1.76E-03	1.87E-03	5.61E-05	5.34E-06	6.90E-05	0.00E+00		-1.24E-03
ADPM	kg Sb-eqv	1.68E-04	1.69E-04	1.46E-06	2.10E-07	3.98E-06	0.00E+00		9.21E-07
ADPE	MJ	3.15E+01	3.67E+01	1.50E+00	1.22E-01	1.27E+00	0.00E+00		-3.02E+01

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use

Parameter	Unit	A1-A3 (uncoated)	A1-A3 (coated)	A4	C2	C3	C4		D
RPEE	MJ	2.21E+01	2.32E+01	2.68E-02	1.42E-03	1.83E-01	0.00E+00		-1.25E+01
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
TPE	MJ	2.21E+01	2.32E+01	2.68E-02	1.42E-03	1.83E-01	0.00E+00		-1.25E+01
NRPE	MJ	3.62E+01	4.15E+01	1.47E+00	1.18E-01	1.41E+00	0.00E+00		-3.56E+01
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
TRPE	MJ	3.62E+01	4.15E+01	1.47E+00	1.18E-01	1.41E+00	0.00E+00		-3.56E+01
SM	kg	4.00E-01	6.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
W	m^3	9.05E-02	7.91E-02	2.00E-04	1.28E-05	7.39E-04	0.00E+00		-6.82E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

End of life - Waste									
Parameter	**Unit**	**A1-A3 (uncoated)**	**A1-A3 (coated)**	**A4**	**C2**	**C3**	**C4**		**D**
HW	kg	1.40E-04	3.56E-04	3.35E-06	3.10E-07	5.95E-03	0.00E+00		-1.21E-03
NHW	kg	3.91E+00	3.98E+00	1.20E-01	6.35E-03	1.14E+00	1.28E-01		-1.44E+00
RW	kg	1.46E-04	1.57E-04	1.00E-05	7.82E-07	4.19E-06	0.00E+00		-1.46E-04

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow									
Parameter	**Unit**	**A1-A3 (uncoated)**	**A1-A3 (coated)**	**A4**	**C2**	**C3**	**C4**		**D**
CR	kg	-	-	-	-	-	-		-
MR	kg	-	-	-	-	9.01E-01	-		5.01E-01
MER	kg	-	-	-	-	6.20E-02	-		-
EEE	MJ	-	-	-	-	-	-		-
ETE	MJ	-	-	-	-	-	-		-

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9.0 E-03 = $9.0*10^{-3}$ = 0.009

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase
National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing prosess (A3).

Data source	Amount	Unit
econinvent v3.6 (2020)	30.3	g CO_2-eqv/kWh

Dangerous substances

- [x] The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- [ ] The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0.1 % by weight.
- [ ] The product contain dangerous substances, more than 0.1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- [ ] The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Name	CAS no.	Amount
Not relevant		

Indoor environment
Not relevant

Carbon footprint

Calculations connected to climate change and global warming potential (GWP) include greenhouse gas emissions from fossil sources and land use change connected to extraction of bauxite, but does not include calculations of biogenic emissions of CO_2.

Bibliography

ISO 14025:2010	*Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
ISO 14044:2006	*Environmental management - Life cycle assessment - Requirements and guidelines*
EN 15804:2012+A1:2013	*Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products*
ISO 21930:2007	*Sustainability in building construction - Environmental declaration of building products*
NPCR 013	*NPCR 013 version 3.0 Part B for steel and aluminium construction products.*
Sadeleer, I., Brekke, A. and Booto, G. (2020)	*Background report for the Environmental Product Declarations for Speira Holmestrand: Rolled products with 0%, 40%, 75%, 85% and 95% recycled aluminium. Mill-finish and coil coated*

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