ICC-ES PMG Product Certificate

PMG-1023

Effective Date: October 2024

This listing is subject to re-examination in one year.

CSI: DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING (HVAC)
Section: 23 31 00—HVAC Ducts and Casings

Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Product: AKDUCT® and AKDUCT® Premier

Listee: AQC Industries LLC
4600 Churchill St.
Shoreview, Minnesota 55126
www.blueduct.com

Compliance with the following codes:

2024, 2021, 2018, 2015, 2012 and 2009 *International Mechanical Code*® (IMC)
2024, 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
2024, 2021, 2018, 2015, 2012 and 2009 *Uniform Mechanical Code*® (UMC)*
2022 and 2019, 2016, 2013, 2010 and 2007 *California Mechanical Code*® (CMC)

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Compliance with the following standards:

ASTM D 2412-2021, Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
ICC-ES LC1014 (Apprv. June 2008, Rev. March 2016), PMG Listing Criteria for Underground Plastic Air Ducts
NSF Protocol P374-2010, Air Duct Thermal Efficiency Performance
UL 723 (Ed. 11), Test for Surface Burning Characteristics of Building Materials

Identification:

The AQC Industries AKDUCT® and AKDUCT® Premier duct and fittings described in this listing are identified by a stamp bearing the manufacturer's name (AQC Industries LLC) and/or trademark, the product name, model number and the ICC-ES PMG listing mark. The ICC-ES PMG listing mark must be placed on the listed product's packaging or installation instructions.

Installation:

Installation of AKDUCT® and AKDUCT® Premier duct and fittings must comply with the manufacturer's published installation instructions and the applicable codes.

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.

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Clamps & Gaskets Sealing Method: Two sections of pipe (or pipe and fitting) are placed end to end. The adhesive backing is peeled off a gasket and the gasket is wrapped around the duct. The gasket should overlap approximately ¾ inch (19 mm). A clamp is placed around the gasket, with the clamp and gasket lined up. Tighten the clamp screws with an adjustable clutch drill. Clamp ends do not have to meet each other to be airtight.

When installing in ambient temperatures above 90° Fahrenheit, consult AQC Industries for special installation instructions.

Flanged Duct Sealing Method: Two beads of The Blue Duct sealant is applied to each flanged end and around the bolt holes. Two sections of pipe (or pipe and fitting) are placed end to end. The bolts, nuts and washer are installed through the predrilled template holes. When tightening the bolts with an adjustable clutch drill, the torque should be set between 25 to 30 in. lbs. An impact drill is not acceptable. Sealant is used to cover both ends of each nut and bolt, and to fill any voids on the exterior of the flange joints.

Underground Systems: After the excavation has been made, no special bedding needs to be used for AKDUCT®. It can be direct buried and backfilled using dry silica sand or pea gravel. Spread the backfill material evenly around the duct in no more than 1 ft. lift increments, making sure there are no gaps. Normally pea gravel does not need further compaction. If compaction is going to take place, plate tamping equipment is the recommended practice. Backfill to a minimum of 2" above to the top of the duct. The concrete slab is then poured. In cases of open site construction and when heavy rain is likely prior to backfill, it is recommended that duct be anchored to avoid buoyancy forces and floating which can damage the installation.

When backfilling or grading, care should be taken to not push heavy loads directly onto the duct, nor should heavy equipment be allowed to run over the duct. The loading of the duct from wet concrete and/or soil above the duct must be limited so as not to produce deflections greater than 15 percent of the original duct diameter (see Table 1).

Models:

The AQC Industries AKDUCT® duct and fittings are an underground air duct and fitting system for use in forced-air heating and cooling systems in accordance with Section 603.8 of the IMC, Section M1601.1.2 of the IRC, or Section 602.0 of both the CMC and the UMC, as applicable. See Table 2, below.

The AQC Industries AKDUCT® Premier duct and fittings are an above ground air duct and fitting system for use in forced-air heating and cooling systems in accordance with IRC Section M1601.1.1. See Table 2, below.

The AQC Industries AKDUCT® and AKDUCT® Premier duct and fittings are designed for use in systems with a maximum rated positive pressure equivalent to 10 inch water column and a maximum rated negative pressure of 2 inch water column in accordance with Section 603.3 of the IMC.

Flood Plain Elevation: Product was tested to withstand 8 feet water column pressure for 7 days with no leakage. Product may be installed right on the sub-grade of excavation without any further sub material being required except when it is bedrock then a sub soil such as sand or construction grade fill or pea gravel may be used under the duct.

Surface Burning Characteristics: AKDUCT® Premier has a flame spread index of 200 or less when tested in accordance with UL 723 (ASTM E 84).

Thermal Distribution Efficiency (TDE): When tested to NSF Protocol P374, the AKDUCT® and AKDUCT® Premier air duct, in 10 inches in diameter and greater, exhibited equivalent TDE to a coiled steel reference duct surrounded on all sides with R-10 rated insulation.

Conditions of Listing:

1. Designs using AKDUCT® duct and fittings must be limited to systems with a maximum air temperature of 150˚F (66˚C) at the discharge of the unit entering the duct system. Sizing must be in accordance with Section 603.2 of the IMC, Section M1601.1 of the IRC, or Section 601.2 of both the CMC and the UMC.
2. AKDUCT® duct and fittings can be installed underground or embedded within concrete slabs.
3. AKDUCT® Premier duct and fittings can be installed as part of an aboveground duct system in accordance with IRC Section M1601.1.1.

4. The design of concrete slabs with an embedded air duct is beyond the scope of this evaluation.
5. Underground air duct pipes located below the design flood elevation must be designed and installed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation, in accordance with Section 603.13 of the IMC, Section M1601.3.8 of the IRC, or Section 604.6 of both the CMC and the UMC, as applicable.
6. The maximum depth below Base Flood Elevation (BFE) in which the duct can be installed flat on grade based on testing per LC1014 Section 4.3.2 is 48 inches (1219 mm). For installation beyond 48 inches below BFE, AKDUCT® shall have a minimum slope of 1/8 inch per foot (10.4mm/m) to allow drainage to a point provided with access.
7. The AQC Industries AKDUCT® duct and fittings are manufactured by AQC Industries LLC under a quality control program with annual surveillance inspections by ICC-ES.

TABLE 1—LOADING[1]

PIPE DIAMETER (inches)	AVERAGE WALL THICKNESS AS TESTED (inch)	LOAD at 15% DEFLECTION (lbs/lineal ft)
6	0.429	205
8	0.507	353
10	0.416	102
12	0.575	117
14	0.700	135
16	0.472	189
18	0.692	208
20	0.460	433
24	0.770	390
30	0.693	400
36	0.850	383
48	0.750	258

For **SI:** 1 inch = 25.4 mm, 1 lb. = 14.59 N/m.

[1] Loads are the results of ASTM 2412 testing without safety factors yielding a 15% deflection based on inside diameter.

TABLE 2—SYSTEM COMPONENTS

ITEM	DESCRIPTION	SIZE (inches)
ACCESSORIES:20-0027	Foam Trench Block	
ACCESSORIES:20-0030	Damper	
ACCESSORIES:20-0050	Boot Extension	4" x 12" - 16"
ACCESSORIES:20-0100A	Air Test Kit	13"
ACCESSORIES:20-0101A	Air Test Kit	8"
ACCESSORIES:20-0200	Boot Reducer	4" x 12" to $2^1/_4$" x 12"
ACCESSORIES:20-0300	Bolt with 1 nut & 2 washers (pkg of 12)	$2^1/_2$" x $^1/_4$"
ACCESSORIES:20-0711	Airtight Sealant	
BLUE:03-0090	Rubber Gasket for 3" HV	3"
BLUE:03-2510	Pipe	3"
BLUE:03-2511	End Cap	3"
BLUE:03-2530	90 Degree Elbow (Long Sweep)	3"
BLUE:03-2531	90 Degree Elbow (Short Sweep)	3"
BLUE:03-2532	45 Degree Elbow	3"
BLUE:03-2533	22.5 Degree Elbow	3"
BLUE:03-2534	Sound Attenuator	3"
BLUE:03-2535	Sound Attenuator Replacement Cartridge	3"
BLUE:03-2590	Saddle Take Off	3"
BLUE:06-2501	Offset Footer Boot	6"
BLUE:06-2502	90 Degree Boot (4 x 12)	6"
BLUE:06-2510	Pipe	6" x 8'
BLUE:06-2511	End Cap	6"
BLUE:06-2530	90/45-degree Elbow	6"
BLUE:06-2531	22.5 Degree Elbow	6"

ITEM	DESCRIPTION	SIZE (inches)
BLUE:06-2532	15 Degree Elbow	6"
BLUE:06-2533	11.25 Degree Elbow	6"
BLUE:06-2560	Plenum Adapter with Screws	6"
BLUE:06-2570	Center Saddle - 4” x 12” Boot with screws	6"
BLUE:08-2502	90 Degree Boot (4 x 12)	8"
BLUE:08-2510	Pipe	8" x 8'
BLUE:08-2511	End Cap	8"
BLUE:08-2520	Tee	8"
BLUE:08-2525	Tee Reducer	8" x 8" x 8" - 6"
BLUE:08-2530	90/45 Degree Elbow	8"
BLUE:08-2531	22.5 Degree Elbow	8"
BLUE:08-2532	15 Degree Elbow	8"
BLUE:08-2533	11.25 Degree Elbow	8"
BLUE:08-2540	Reducer	8" x 6"
BLUE:08-2560	Plenum Adapter with Screws	8"
BLUE:08-2565	Plenum Adapter with 12" piece & End Cap	8"
BLUE:08-2570	Center Saddle - 4” x12" Boot with screws	8"
BLUE:10-2510	Pipe	10" x 8'
BLUE:10-2511	End Cap	10"
BLUE:10-2515	Inline Boot (4 x 12)	10"
BLUE:10-2520	Tee	10"
BLUE:10-2530	90/45-degree Elbow	10"
BLUE:10-2531	22.5 Degree Elbow	10"
BLUE:10-2532	15 Degree Elbow	10"
BLUE:10-2533	11.25 Degree Elbow	10"
BLUE:10-2540	Round Reducer	10" x 8"
BLUE:10-2545	Round Reducer	10" x 8" x 6"
BLUE:10-2550	Offset Saddle - 4" x 12" Boot with screws. Fits 10" pipe	10"
BLUE:10-2560	Plenum Adapter with Screws	10"
BLUE:10-2570	Center Saddle - 4 x 12 boot with screws	10"
BLUE:10-2578	Saddle Reducer (with screws) Fits 10" & 12" Pipe	10" - 8" x 6"
BLUE:12-2510	Pipe	12" x 8'
BLUE:12-2511	End Cap	12"
BLUE:12-2520	Tee	12"
BLUE:12-2530	90/45 Degree Elbow	12"
BLUE:12-2531	22.5 Degree Elbow	12"
BLUE:12-2532	15 Degree Elbow	12"
BLUE:12-2533	11.25 Degree Elbow	12"
BLUE:12-2540	Reducer	12" x 10"
BLUE:12-2547	Reducer	12" x 10" x 8" x 6"
BLUE:12-2550	Offset Saddle - 4 x 12 Boot with screws. Fits 12", 14", 16" & 18" Pipe	12"
BLUE:12-2551	Offset Saddle - 4" x 24" Boot with screws	12"
BLUE:12-2560	Plenum Adapter with Screws	12"
BLUE:12-2577	Saddle Reducer	12" x 10"
BLUE:14-2510	Pipe	14" x 8'
BLUE:14-2511	End Cap	14"
BLUE:14-2530	90/45 Degree Elbow	14"
BLUE:14-2531	22.5 Degree Elbow	14"
BLUE:14-2532	15 Degree Elbow	14"
BLUE:14-2533	11.25 Degree Elbow	14"
BLUE:14-2560	Plenum Adapter with Screws	14"

ITEM	DESCRIPTION	SIZE (inches)
BLUE:14-2575	Wye	14"
BLUE:14-2577	Saddle Reducer - Fits 14", 16", & 18" Pipe	14" x 12"
BLUE:16-2510	Pipe	16" x 8'
BLUE:16-2511	End Cap	16"
BLUE:16-2530	90/45 Degree Elbow	16"
BLUE:16-2531	22.5 Degree Elbow	16"
BLUE:16-2532	15 Degree Elbow	16"
BLUE:16-2533	11.25 Degree Elbow	16"
BLUE:16-2540	Reducer	16" x 14"
BLUE:16-2547	Reducer	16" x 14" x 12" x 10"
BLUE:16-2560	Plenum Adapter with Screws	16"
BLUE:16-2575	Wye	16"
BLUE:16-2577	Saddle Reducer - Round - Fits 16" & 18" Pipe	16" x 14"
BLUE:16-3510F	Pipe with Flange	16" x 8'
BLUE:18-2510	Pipe	18" x 8'
BLUE:18-2511	End Cap	18"
BLUE:18-2530	90/45 Degree Elbow	18"
BLUE:18-2531	22.5 Degree Elbow	18"
BLUE:18-2532	15 Degree Elbow	18"
BLUE:18-2533	11.25 Degree Elbow	18"
BLUE:18-2540	Eccentric Reducer	18" x 16" x14" x 12"
BLUE:18-2560	Plenum Adapter with Screws	18"
BLUE:18-2577	Saddle Reducer - Round	18" x 16"
BLUE:18-3510F	Pipe with Flange	18" x 8'
BLUE:18-3541F	Eccentric Reducer with Flange	18" x 16"
BLUE:20-0010	Plenum	20" x 24" x 36"
BLUE:20-0015	Plenum	25" x 30" x 48"
BLUE:20-0050	Boot Extension	4x12 - 16"
BLUE:20-0060	Universal Linear Diffuser Adapter	
BLUE:20-0061	Linear Diffuser 49" x 7" x 8" O.D.	48"
BLUE:20-0062	Linear Diffused 37" x 7" x 8" O.D.	36"
BLUE:20-0063	Linear Diffuser 25" x 7" x 8" O.D.	24"
BLUE:20-3510F	Pipe with Flange	20"x 8'
BLUE:20-3530F	90/45 Degree Elbow with Flange	20"
BLUE:20-3531F	22.5 Degree Elbow	20"
BLUE:20-3532F	15 Degree Elbow	20"
BLUE:20-3533F	11.25 Degree Elbow	20"
BLUE:20-3541F	Eccentric Reducer with Flange	20" x 18"
BLUE:20-3542F	Eccentric Reducer	20" x 18" x 16"
BLUE:20-3575F	Tee/Wye	20"
BLUE:24-3510F	Pipe with Flange	24" x 8'
BLUE:24-3530F	90/45 Degree Elbow with Flange	24"
BLUE:24-3531F	22.5 Degree Elbow	24"
BLUE:24-3532F	15 Degree Elbow	24"
BLUE:24-3533F	11.25 Degree Elbow	24"
BLUE:24-3541F	Eccentric Reducer with Flange	24" x 20"
BLUE:24-3575F	Tee/Wye	24"
BLUE:24-3542F	Eccentric Reducer with Flange	24" x 20" x 18"
BLUE:24-3543F	Eccentric Reducer with Flange	24" x 20" x 18" x 16"
BLUE:30-3510F	Pipe with Flange	30" x 8'
BLUE:30-3530F	90/45 Degree Elbow with Flange	30"
BLUE:30-3531F	22.5 Degree Elbow	30"

ITEM	DESCRIPTION	SIZE (inches)
BLUE:30-3532F	15 Degree Elbow	30"
BLUE:30-3533F	11.25 Degree Elbow	30"
BLUE:30-3575F	Tee/Wye	30"
BLUE:30-3542F	Eccentric Reducer	30" x 24"
BLUE: 36-3510F	Pipe with Flange	36" x 8'
BLUE:36-3530F	90/45 Degree Elbow with Flange	36"
BLUE:36-3531F	22.5 Degree Elbow	36"
BLUE:36-3532F	15 Degree Elbow	36"
BLUE:36-3533F	11.25 Degree Elbow	36"
BLUE:36-3575F	Tee/Wye	36"
BLUE:36-3543F	Eccentric Reducer	36" x 30" x 24"
BLUE:48-3510F	Pipe with Flange	48" x 6'
BLUE:48-3530F	90/45 Degree Elbow with Flange	48"
BLUE:48-3531F	22.5 Degree Elbow	48"
BLUE:48-3532F	15 Degree Elbow	48"
BLUE:48-3533F	11.25 Degree Elbow	48"
BLUE:48-3534F	7.5 Degree Elbow	48"
BLUE:48-3575F	Tee/Wye	48"
CLAMPS:03-0080	Stainless Steel Clamp	3"
CLAMPS:06-0080	Clamps & Gasket Set	6"
CLAMPS:08-0080	Clamps & Gasket Set	8"
CLAMPS:10-0080	Clamps & Gasket Set	10"
CLAMPS:12-0081	Clamps & Gasket Set	12"
CLAMPS:14-0081	Clamps & Gasket Set	14"
CLAMPS:16-0081	Clamps & Gasket Set	16"
CLAMPS:16-0100	Steel Clamp	16"
CLAMPS:16-0912	wide W6403 Gasket	12"
CLAMPS:18-0081	Clamps & Gasket Set	18"
CLAMPS:18-0100	SS Clamp	18"
CLAMPS:18-0912	wide W6403 Gasket	12"
CLAMPS: 20-0081	Clamps & Gasket Set	20"
CLAMPS: 24-0081	Clamps & Gasket Set	24"
CLAMPS: 30-0081	Clamps & Gasket Set	30"
CLAMPS: 36-0081	Clamps & Gasket Set	36"
CLAMPS: 48-0081	Clamps & Gasket Set	48"

ICC-ES Evaluation Report

PMG-1023 CMC and CRC Supplement

Reissued: October 2024

This report is subject to renewal October 2025

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DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING (HVAC)
Section: 23 31 00—HVAC Ducts and Casings

REPORT HOLDER:

AQC INDUSTRIES LLC
4600 CHURCHILL ST.
SHOREVIEW, MINNESOTA 55126
www.blueduct.com

EVALUATION SUBJECT:

AKDUCT® AND AKDUCT® PREMIER

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the AQC Industries AKDUCT® and AKDUCT® Premier duct and fittings, described in ICC-ES master evaluation report PMG-1023, have also been evaluated for compliance with the codes noted below as adopted by the state of California.

Applicable code editions:

- 2022 *California Mechanical Code* (CMC)
- 2022 *California Residential Code* (CRC)
- 2022 *California Energy Code* (CEC)

2.0 CONCLUSIONS

The AQC Industries AKDUCT® and AKDUCT® Premier duct and fitting, described in Sections 2.0 through 6.0 of the master evaluation report PMG-1023, comply with the CMC Chapter 6, and the CRC Part V, and is subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The AQC Industries AKDUCT® and AKDUCT® Premier duct and fitting described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report PMG-1023.
- The design, installation and inspection are in accordance with additional requirements of the 2023 CMC or CRC, as applicable.
- Designs using AKDUCT® duct and fittings must be limited to systems with a maximum air temperature of 150˚F (66˚C) at the discharge of the unit entering the duct system. Sizing must be in accordance with Section 601.2 of the 2023 CMC.
- AKDUCT® duct and fittings can be installed underground or embedded within concrete slabs. The design of concrete slabs with an embedded air duct is beyond the scope of this evaluation.
- Underground air duct pipes located below the design flood elevation must be designed and installed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation, in accordance with Section 604.6 of the 2023 CMC.

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.

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- The maximum depth below Base Flood Elevation (BFE) in which the duct can be installed flat on grade based on testing per LC1014 Section 4.3.2 is 48 inches (1219 mm). For installation beyond 48 inches below BFE, AKDUCT® shall have a minimum slope of 1/8 inch per foot (10.4mm/m) to allow drainage to a point provided with access.

This supplement expires concurrently with the master report, issued October 2024