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VACUUM ADAPTER SYSTEM AND METHOD

Abstract

An adapter assembly is disclosed. The adapter assembly includes a tapered tube adapter configured to couple to a vacuum hose and a heat shrink tube formed from a heat shrink material and coupled to the tapered tube adapter. The tapered tube adapter is configured to receive the vacuum hose, and the heat shrink tube is configured to be coupled to an exhaust port of a power tool.

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Background/Summary

RELATED APPLICATIONS [0001] This application claims priority under 35 U.S.C. § 119 to U.S. Provisional Patent Application No. 63/553,982, filed Feb. 15, 2024, the entirety of which is hereby incorporated by reference.

BACKGROUND

[0002] Power tools such as saws, sanders, and grinders may be used in home workshops or on commercial construction sites, for example. These power tools tend to generate harmful airborne particulates including fumes, sawdust, lead particles, silica dust, fiberglass particles, and drywall dust, among other things. Woodworkers and contractors routinely attempt to configure a vacuum (e.g., a Shop-Vac) to collect such harmful particulates by attaching the vacuum's hose to an exhaust port of the power tool being used. However, it is difficult to find adapters that facilitate coupling a vacuum hose with the exhaust port of various power tools. This difficulty stems in part from the fact that each power tool has a unique exhaust port geometry. Additionally, in most cases, woodworkers and contractors must frequently change tools while working on a given project. Therefore, there is a need for a vacuum hose adapter that can attach to a wide variety of power tool exhaust ports.

SUMMARY

[0003] In one aspect, an adapter assembly is disclosed. The adapter assembly includes a tapered tube adapter configured to couple to a vacuum hose and a heat shrink tube formed from a heat shrink material and coupled to the tapered tube adapter. The tapered tube adapter is configured to receive the vacuum hose, and the heat shrink tube is configured to be coupled to an exhaust port of a power tool.

[0004] In some instances, the heat shrink tube includes a first section configured to be coupled to the exhaust port and a second section coupled to the tapered tube adapter. In some instances, the second section is pre-shrunk around the tapered tube adapter. In some instances, the first section shrinks in response to an application of heat. In some instances, the second section is coupled to the tapered tube adapter by an adhesive. In some instances, the tapered tube adapter includes a first end and a second end. The tapered tube adapter can be defined by a first diameter at the first end and a second diameter at the second end, and the first diameter is larger than the second diameter. In some instances, the tapered tube adapter is configured to receive the vacuum hose in a slip fit. In some instances, the first section has a larger diameter than the second section. In some instances, the heat shrink tube is configured to be interchangeably coupled to a plurality of power tools, each power tool having an exhaust port with a unique diameter dimension.

[0005] In another aspect, an adapter assembly is disclosed. The adapter assembly includes a heat shrink tube defined by a first end and a second end, a first opening positioned proximate to the first end, and a tapered tube adapter positioned proximate to the second end and at least partially received within the heat shrink tube. The first opening is configured to receive an exhaust port of a power tool, and the tapered tube adapter is configured to receive a vacuum hose. In some instances, the heat shrink tube is formed from a heat shrink material that shrinks in response to an application of heat. In some instances, the heat shrink tube includes an unshrunk first section proximate to the first end and a pre-shrunk second section proximate to the second end. The second section is coupled to the tapered tube adapter.

[0006] In some instances, the second section includes an adhesive that facilitates coupling between the heat shrink tube and the tapered tube adapter. In some instances, the tapered tube adapter includes an adapter first end proximate to the second end of the heat shrink tube and an adapter second end opposing the adapter first end. The tapered tube adapter is defined by a first diameter at the adapter first end and a second diameter at the adapter second end, and the first diameter is larger than the second diameter. In some instances, the tapered tube adapter is positioned to extend into the heat shrink tube from the second end of the heat shrink tube. In some instances, the tapered tube adapter is configured to receive the vacuum hose in a slip fit. In some instances, the tapered

tube adapter defines a second opening configured to receive the vacuum hose.
[0007] In a further aspect, a method of installing a vacuum adapter is disclosed. The method includes providing an adapter assembly having a tapered tube adapter and a heat shrink tube. The heat shrink tube includes an adhesive at least partially lining an inner surface of the heat shrink tube, a first section, and a second section. The second section at least partially surrounds the tapered tube adapter and is in contact with an outer surface of the tapered tube adapter. The method further includes covering an exhaust port of a power tool with the first section of the heat shrink tube, applying heat to the first section at least until the inner surface of the heat shrink tube is in contact with the exhaust port, and coupling the tapered tube adapter to a vacuum hose.
[0008] In some instances, the tapered tube adapter receives the vacuum hose in a slip fit. In some instances, the first section of the heat shrink tube is configured to receive a plurality of different exhaust ports having different sizes.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0009] The accompanying drawings, which are incorporated in and form a part of this specification, illustrate embodiments of the disclosure and, together with the description, serve to explain the principles of embodiments of the disclosure:
[0010] FIG. **1**A is a perspective side view of an adapter assembly as disclosed herein;
[0011] FIG. **1**B is a perspective bottom view of the adapter assembly of FIG. **1**A;
[0012] FIG. **1**C is a schematic view of the adapter assembly of FIG. **1**A;
[0013] FIG. **2**A is a schematic representations of a first step in a method of installing the adapter assembly of FIG. **1**A as disclosed herein;
[0014] FIG. **2**B is a schematic representations of a second step in a method of installing the adapter assembly of FIG. **1**A as disclosed herein;
[0015] FIG. **2**C is a schematic representation of a third step in the method of installing the adapter assembly of FIG. **1**A as disclosed herein;
[0016] FIG. **2**D is a schematic representation of a fourth step in the method of installing the adapter assembly of FIG. **1**A as disclosed herein;
[0017] FIG. **3** is a perspective view of the adapter assembly of FIG. **1**A after performing the third step of FIG. **2**C;
[0018] FIG. **4** is a perspective view of an installed adapter after performing the fourth step of FIG. **2**D;
[0019] While the disclosure is subject to various modifications and alternative forms, a specific embodiment thereof is shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the drawings and detailed description presented herein are not intended to limit the disclosure to the particular embodiment disclosed. To the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the present disclosure as defined by the appended claims.
DETAILED DESCRIPTION
[0020] The following description is presented to enable a person skilled in the art to make and use embodiments of the disclosure. Various modifications to the illustrated embodiments will be readily apparent to those skilled in the art, and the generic principles herein can be applied to other embodiments and applications without departing from embodiments of the disclosure. Before any embodiments are described in detail, it is to be understood that the disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings, which is limited only by the claims that follow the present disclosure. The disclosure is capable of other embodiments and of being

practiced or of being carried out in various ways.
[0021] It is to be understood that the phraseology and terminology used herein are for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof, as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.
[0022] As used herein, unless otherwise specified or limited, “at least one of A, B, and C,” and similar other phrases, are meant to indicate A, or B, or C, or any combination of A, B, and/or C. As such, this phrase, and similar other phrases can include single or multiple instances of A, B, and/or C, and, in the case that any of A, B, and/or C indicates a category of elements, single or multiple instances of any of the elements of the categories A, B, and/or C.
[0023] The present disclosure is directed to an adapter assembly for coupling an exhaust port of a power tool to a hose of a vacuum device such that the vacuum device may collect particulate matter ejected via the exhaust port of the power tool and prevent such particulate matter from entering the surrounding environment. In general, the adapter assembly may have a first opening at one end and a second opening at another end. One of the first and second openings may be configured to receive the exhaust port of a power tool, and the other of the first and second openings may be configured to receive a vacuum hose. The exemplary embodiments of the present invention described below with reference to the figures may be configured to be compatible with an exhaust port and a vacuum hose that are each substantially cylindrical. However, other geometries of the exhaust port and vacuum hose (and, therefore, of the first and second openings of the adapter assembly) are envisioned, such as having a substantially rectilinear cross-sectional shape.
[0024] Additionally, embodiments of the adapter assembly may be provided in different sizes. Therefore, various components of the adapter assembly may differ dimensionally between embodiments. In general, the adapter assembly may include a tapered tube adapter provided in a size that corresponds to one of a plurality of standard vacuum hose sizes. For example, the tube adapter can be designed to be coupled with a standard vacuum hose having a diameter of about 1.25 inches, about 1.5 inches, about 1.875 inches, and/or about 2.5 inches, among other sizes standard in the art. Alternatively, the tube adapter may be provided in other suitable sizes or shapes. Further, the adapter assembly is compatible with one of a plurality of power tool exhaust port sizes. For example, the adapter assembly may be compatible with an exhaust port having a width or diameter between about 1.25 inches and about 4 inches, although the adapter assembly may also be compatible with exhaust ports having a width or diameter of less than 1.25 inches or greater than 4 inches.
[0025] FIGS. **1**A-**1**C illustrate an adapter assembly **100** according to the disclosure. The adapter assembly **100** includes a first end **105** and a second end **110** opposing the first end **105**. The adapter assembly **100** can include a heat shrink tube **115** and a tapered tube adapter **120**. The heat shrink tube **115** and tapered tube adapter **120** may be substantially coaxial structures in that they may each be formed substantially symmetrically about the same central longitudinal axis A. FIGS. **1**A-**1**C illustrate the adapter assembly **100** prior to installation.
[0026] The heat shrink tube **115** may include a first section **125** proximate to the first end **105** of the adapter assembly **100** and a second section **130** proximate to the second end **110** of the adapter assembly **100**. The second section **130** of the heat shrink tube **115** may at least partially surround the tapered tube adapter **120** (see FIGS. **1**B and **1**C). In some instances, the second section **130** of the heat shrink tube **115** may extend over the entire length of the tapered tube adapter **120** such that the second section **130** reaches the entire way or nearly the entire way to the second end **110** of the adapter assembly **100** and fully covers an outside surface of the tapered tube adapter **120**. Alternatively, the second section **130** may extend over less than the entire length of the tapered tube

adapter **120**, thus leaving a portion of the outside surface of the tapered tube adapter **120** exposed. Further, the second section **130** is pre-shrunk around the tapered tube adapter **120** such that an inner surface of the second section **130** is in contact with the outer surface of the tapered tube adapter **120**.

[0027] It should be noted that the first section **125** of the heat shrink tube **115** will remain substantially unshrunk before the installation process begins, which is described in further detail below. Pre-shrunk means that heat has been applied in advance to the heat shrink tube **115**, or a section of heat shrink tube **115**, to reduce the diameter of the heat shrink tube **115**, or the section of heat shrink tube **115**, from the diameter of the heat shrink tube **115** as originally manufactured. Unshrunk means that the heat shrink tube **115**, or a section of heat shrink tube **115**, has a diameter that is substantially the same as the originally manufactured heat shrink tube **115**, and that the heat shrink tube **115**, or the section of heat shrink tube **115**, is capable of shrinking in diameter upon the application of heat to the heat shrink tube **115**, or the section of heat shrink tube **115**.

[0028] The second section **130** may be secured or coupled to the tapered tube adapter **120** via the friction force between the outer surface of the tapered tube adapter **120** and the inner surface of the heat shrink tube **115**. In some forms, the second section **130** is coupled to the tapered tube adapter **120** by an adhesive agent, which may be pre-manufactured on or applied to the inner surface of the heat shrink tube **115**, thus lining the inner surface of the heat shrink tube **115**. Therefore, the second section **130** of the heat shrink tube **115** may be pre-shrunk so as to be in contact with, and follow the contours of, the outer surface of the tapered tube adapter **120**, while also being adhesively coupled to the tapered tube adapter **120**.

[0029] The first section **125** of the heat shrink tube **115** may be substantially cylindrical or substantially frustoconical in shape. In some instances, an internal diameter of the first section **125** may increase from the portion of the first section **125** proximate to the tapered tube adapter **120** to the portion of the first section **125** proximate to the first end **105** of the adapter assembly **100**. At the first end **105**, the first section **125** may have a first rim **135** that defines a first opening of the adapter assembly **100**. The first rim **135** may have a substantially circular profile. Therefore, the adapter assembly **100** may have a first internal diameter D**1** at the first end **105** (see FIG. **1**C). The first section **125** of the heat shrink tube **115** is configured to receive a variety of power tool exhaust ports having different sizes. For example, the first section **125** may be configured to receive an exhaust port having a diameter, or widest cross-sectional dimension, between about **1.25** inches and about **4** inches. Additionally, while the first section **125** is illustrated as having a substantially circular profile, the first section **125** may also be provided in any suitable shape.

[0030] Likewise, as shown best in FIG. **1**B, the tapered tube adapter **120** may have a second rim **140** at the second end **110** of the adapter assembly **100**. The second rim **140** may form a second opening of the adapter assembly **100**. The second rim **140** may have a substantially circular profile. Therefore, the adapter assembly **100** may have a second internal diameter D**2** at the second end **110** (see FIGS. **1**B and **1**C). The second internal diameter D**2** may be smaller than the first internal diameter D**1**. The tapered tube adapter **120** is configured to receive one of a variety of vacuum hose sizes. Additionally, while the tapered tube adapter **120** is illustrated as having a substantially circular cross-section, the tapered tube adapter **120** may be provided in any suitable shape.

[0031] The heat shrink tube **115** may be formed from a heat shrink material designed to contract or shrink in size (e.g., exhibit a decrease in width, diameter, circumference, and/or other dimensions) when exposed to heat. For example, the heat shrink tube **115** may comprise a thermoplastic compound such as polyolefin, fluoropolymers including PTFE, FEP, and PFA, polyvinyl chloride (PVC), neoprene, silicon elastomer, fluoroelastomer (e.g., Viton), polyvinylidene fluoride (PVDF), or any other suitable material. Further, the heat shrink tube **115** may be formed from a material having a relatively high shrink ratio. The heat shrink material can have a shrink ratio of at least about 1.5:1 (e.g., a material that will shrink by up to a factor of 1.5 when heat is applied). Alternatively, the heat shrink material can have a shrink ratio of at least about 2:1, at least about

3:1, at least about 4:1, at least about 5:1, or at least about 6:1. In some instances, the first section **125** of the heat shrink tube **115** may be formed from the same heat shrink material as the second section **130**. In other instances, the first section **125** may be formed from a different material than the second section **130**.

[0032] The tapered tube adapter **120** may be formed from a rigid material, such as a plastic. For example, the tapered tube adapter **120** may be formed from polyethylene, polypropylene, polystyrene, acrylonitrile butadiene styrene (ABS), polycarbonate, polyethylene terephthalate, polyvinyl chloride (PVC), or any other suitable material.

[0033] Referring further to FIG. **1**C, the tapered tube adapter **120** is configured to receive a vacuum hose **180**. It should be noted that the vacuum hose **180** is coupled to and in fluid communication with a vacuum device (not shown). The tapered tube adapter **120** may have a first end **150** and a second end **145**, which forms the second rim **140**, opposing the first end **150**. The second end **145** of the tapered tube adapter **120** may correspond to and substantially align with the second end **110** of the adapter assembly **100**. Thus, the second end **145** of the tapered tube adapter **120** defines the second internal diameter D**2** of the adapter assembly **100**. At the second end **145** of the tapered tube adapter **120**, the adapter assembly **100** has a third internal diameter D**3**. The tapered tube adapter **120** may be imparted with a tapered, frustoconical, or other shape such that the width or diameter of the tapered tube adapter **120** tapers from the second end **145** to the first end **150**. For example, the third internal diameter D**3** may be smaller than the second internal diameter D**2**.

[0034] This tapered geometry can facilitate a tapered slip fit between the tapered tube adapter **120** and the vacuum hose **180**. For example, the second internal diameter D**2** forms a slip fit with the vacuum hose **180** such that the vacuum hose **180** can slide into the tapered tube adapter **120** at the second end **145**, and the third internal diameter D**3** forms a transition fit with the vacuum hose **180** such that the third internal diameter D**3** is at least slightly smaller than the outer diameter of the vacuum hose **180** to form a selective coupling when a mild to moderate amount of force is used to push the vacuum hose **180** toward the first end **150**.

[0035] An exemplary embodiment of the adapter assembly **100** configured for use with a 2.5 inch vacuum hose will now be described with reference to FIG. **1**C. However, it is to be understood that the adapter assembly **100** may be provided for use with vacuum hoses of other sizes and the various components of the adapter assembly **100** may have any suitable shape, size, or configuration. In this example, the second opening at the second end **110** of the adapter assembly **100** (and the second end **145** of the tapered tube adapter **120**) may be substantially equal (or slightly larger) in size and shape to the end of the vacuum hose **180**. For example, the second internal diameter D**2** of the adapter assembly **100** may be imparted with a value substantially equal to about 2.5 inches. In this embodiment, the third internal diameter D**3** may be imparted with a value of about 2.28 inches, and the first internal diameter D**1** may be imparted with a value of about 4 inches. Accordingly, the vacuum hose **180** will slide into the tapered tube adapter **120** at the second end **145** and form a selective coupling with the tapered tube adapter **120** when a mild to moderate amount of force is used to push the vacuum hose **180** toward the first end **150**.

[0036] Further, the adapter assembly **100** may have an overall height H**1**. The overall height H**1** may be defined by the distance between the first end **105** and the second end **110** of the adapter assembly **100** and may be measured in a direction substantially parallel to the axis A. Similarly, the tapered tube adapter **120** may have a height H**2**. The height H**2** may be defined by the distance between the second end **145** and the first end **150** of the tapered tube adapter **120** and may be measured in a direction substantially parallel to the axis A. In some forms, the adapter assembly **100** may have an overall height H**1** of about 4 inches. In some other forms, the overall height H**1** may be imparted with a value of at least about 2 inches, at least about 3 inches, at least about 4 inches, at least about 5 inches, or at least about 6 inches. Further, the tapered tube adapter **120** may have a height H**2** of about 1.25 inches. In some forms, the height H**2** may be imparted with a value of about 0.75 inches to about 2 inches. Various components of the adapter assembly **100** may be

provided with different dimensions depending on the application. For example, the dimensions of the tapered tube adapter **120** may be modified depending on the size of the vacuum hose **180**.
[0037] FIGS. **2**A-**2**D illustrate the steps of a method of coupling the vacuum hose **180** to an exhaust port **165** of a power tool **155** using the adapter assembly **100**. As shown in FIGS. **2**A-**2**D, the power tool **155** may have, among other components, a body **160** and the exhaust port **165**. The exhaust port **165** may be coupled to and extend outwardly from the body **160**, or the exhaust port **165** may be formed integrally with the body **160**. The exhaust port **165** is configured to eject particulate matter, exhaust fumes, or other materials or byproducts from the power tool **155** while the power tool **155** is in use.
[0038] FIG. **2**A illustrates step **200**, wherein the first opening of the adapter assembly **100** defined by the first rim **135** is aligned with the exhaust port **165**. The adapter assembly **100** is then moved toward the exhaust port **165** in the direction indicated by arrow **170** in FIG. **2**A. FIG. **2**B illustrates step **210**, wherein the exhaust port **165** is at least partially received within the heat shrink tube **115** such that the first section **125** of the heat shrink tube **115** at least partially surrounds the exhaust port **165**.
[0039] FIG. **2**C illustrates step **220**, wherein a heating device **175** is used to apply heat to the first section **125** of the heat shrink tube **115** while the heat shrink tube **115** is at least partially surrounding the exhaust port **165**. The heating device **175** may be a heat gun, blow dryer, heat lamp, or any other suitable device capable of applying localized heat to an object. The heat from the heating device **175** causes the heat shrink material of the first section **125** to shrink around the exhaust port **165**. In other words, the diameter/circumference of the first section **125** will decrease in response to the application of heat from the heating device **175**. Heat is applied to the first section **125** at least until the first section **125** shrinks enough to come into contact with the outer surface of the exhaust port **165**. In this way, the heating device **175** may cause the first section **125** to be securely fitted to the exhaust port **165**, as shown in FIG. **2**D.
[0040] In embodiments where the heat shrink tube **115** includes adhesive at least partially lining the inner surface, the inner surface of the heat shrink tube **115** will become adhered to the exhaust port **165**. Thus, the first section **125** of the heat shrink tube **115** will follow the contours of the outer surface of the exhaust port **165**, while also being adhesively coupled to the exhaust port **165**. In some forms, the heat shrink tube **115** does not include an adhesive partially lining the inner surface. In this instance, the first section **125** is secured or coupled to the exhaust port **165** via the friction force between the outer surface of the exhaust port **165** and the inner surface of the heat shrink tube **115**. Alternatively, adhesive can be applied to the outer surface of the exhaust port **165** prior to step **210**.
[0041] Once the adapter assembly **100** is installed on the exhaust port **165**, the vacuum hose **180** may be selectively coupled with the tapered tube adapter **120** in step **230**, as shown in FIG. **2**D. For example, with the adapter assembly **100** installed and securely coupled to the exhaust port **165**, the user may align a first end **185** of the vacuum hose **180** with the second opening of the adapter assembly **100** (i.e., the second end **145** of the tapered tube adapter **120**). The first end **185** of the vacuum hose **180** can then be moved toward the tapered tube adapter **120** in the direction of the arrow **190**. The vacuum hose **180** can be pushed into the tapered tube adapter **120** until the first end **185** of the vacuum hose **180** approaches or reaches the first end **150** of the tapered tube adapter **120**. The tapered geometry of the tapered tube adapter **120** provides a secure connection between the tapered tube adapter **120** and the vacuum hose **180** such that the vacuum hose **180** is held securely in place within the tapered tube adapter **120**. In some instances, before coupling the vacuum hose **180** to the tapered tube adapter **120**, it may be advantageous to allow the adapter assembly **100** time to cool due to the application of heat to the heat shrink tube **115** in step **220**. In other instances, the adapter assembly **100** may be installed without allowing time for cooling.
[0042] FIG. **3** illustrates the adapter assembly **100** after installation of the adapter assembly **100** onto the exhaust port **165** of a power tool **155** in step **220** but prior to coupling the adapter

assembly **100** to the vacuum hose **180** in step **230**. As shown, the first section **125** of the heat shrink tube **115** may “hug” or be tightly fitted to the exhaust port **165** after application of heat from the heating device **175**. Thus, the adapter assembly **100** may be coupled to and extend outwardly away from the exhaust port **165**.

[0043] FIG. **4** illustrates the adapter assembly **100** after step **230** is complete, i.e., after the first end **105** has been coupled to the exhaust port **165** of a power tool **155** and the second end **110** has been coupled to the vacuum hose **180**. As shown, the first end **185** of the vacuum hose **180** has been inserted into and securely fitted within the tapered tube adapter **120**. At this stage, the adapter assembly **100** provides a substantially air-tight connection between the exhaust port **165** and the vacuum hose **180**. Thus, the power tool **155** may be powered on and used, and any harmful particulate matter ejected by the power tool **155** via the exhaust port **165** during use will be collected by the vacuum device through the vacuum hose **180**.

[0044] The adapter assembly **100** effectively seals an air flow path between the power tool **155** and the vacuum hose **180** such that harmful particulate matter may be prevented from entering the surrounding environment. Therefore, the adapter assembly **100** protects the users of the power tool **155** from, for example, inhaling harmful particulate matter generated by the power tool **155** during use. Because the adapter assembly **100** can be provided in a variety of sizes and shapes, as described above, a power tool user can install various adapter assemblies **100** onto one or more power tools **155** in a workshop space. Accordingly, once each of the adapter assemblies **100** is installed, the users of the power tools **155** can quickly and easily couple (and decouple) the vacuum hose **180** to the exhaust ports **165** of different power tools **155** before the user activates a certain power tool **155**, allowing for the safe collection of particulate matter.

[0045] Thus, an improved adapter assembly for a power tool is provided. In other embodiments, other configurations are possible. It should be known that this disclosure contemplates various combinations, sub-combinations, and substitutions of the components discussed above.

Claims

1. An adapter assembly comprising: a tapered tube adapter configured to couple to a vacuum hose; and a heat shrink tube formed from a heat shrink material and coupled to the tapered tube adapter, wherein the tapered tube adapter is configured to receive the vacuum hose, and wherein the heat shrink tube is configured to be coupled to an exhaust port of a power tool.

2. The adapter assembly of claim 1, wherein the heat shrink tube includes a first section configured to be coupled to the exhaust port and a second section coupled to the tapered tube adapter.

3. The adapter assembly of claim 2, wherein the second section is pre-shrunk around the tapered tube adapter.

4. The adapter assembly of claim 2, wherein the first section shrinks in response to an application of heat.

5. The adapter assembly of claim 2, wherein the second section is coupled to the tapered tube adapter by an adhesive.

6. The adapter assembly of claim 1, wherein the tapered tube adapter includes a first end and a second end, wherein the tapered tube adapter is defined by a first diameter at the first end and a second diameter at the second end, and wherein the first diameter is larger than the second diameter.

7. The adapter assembly of claim 1, wherein the tapered tube adapter is configured to receive the vacuum hose in a slip fit.

8. The adapter assembly of claim 2, wherein the first section has a larger diameter than the second section.

9. The adapter assembly of claim 1, wherein the heat shrink tube is configured to be interchangeably coupled to a plurality of power tools, the exhaust port of each power tool having a

unique diameter dimension.

10. An adapter assembly comprising: a heat shrink tube defined by a first end and a second end; a first opening positioned proximate to the first end; and a tapered tube adapter positioned proximate to the second end and at least partially received within the heat shrink tube, wherein the first opening is configured to receive an exhaust port of a power tool, and the tapered tube adapter is configured to receive a vacuum hose.

11. The adapter assembly of claim 10, wherein the heat shrink tube is formed from a heat shrink material that shrinks in response to an application of heat.

12. The adapter assembly of claim 11, wherein the heat shrink tube includes an unshrunk first section proximate to the first end and a pre-shrunk second section proximate to the second end, the second section being coupled to the tapered tube adapter.

13. The adapter assembly of claim 12, wherein the second section includes an adhesive that facilitates coupling between the heat shrink tube and the tapered tube adapter.

14. The adapter assembly of claim 10, wherein the tapered tube adapter includes an adapter first end proximate to the second end of the heat shrink tube and an adapter second end opposing the adapter first end, wherein the tapered tube adapter is defined by a first diameter at the adapter first end and a second diameter at the adapter second end, and wherein the first diameter is larger than the second diameter.

15. The adapter assembly of claim 14, wherein the tapered tube adapter is positioned to extend into the heat shrink tube from the second end of the heat shrink tube.

16. The adapter assembly of claim 10, wherein the tapered tube adapter is configured to receive the vacuum hose in a slip fit.

17. The adapter assembly of claim 10, wherein the tapered tube adapter defines a second opening configured to receive the vacuum hose.

18. A method of installing a vacuum adapter assembly comprising: providing an adapter assembly having a tapered tube adapter and a heat shrink tube, the heat shrink tube including: an adhesive at least partially lining an inner surface of the heat shrink tube, a first section, and a second section, the second section at least partially surrounding the tapered tube adapter and in contact with an outer surface of the tapered tube adapter; covering an exhaust port of a power tool with the first section of the heat shrink tube; applying heat to the first section at least until the inner surface of the heat shrink tube is in contact with the exhaust port; and coupling the tapered tube adapter to a vacuum hose.

19. The method of claim 18, wherein the tapered tube adapter receives the vacuum hose in a slip fit.

20. The method of claim 18, wherein the first section of the heat shrink tube is configured to receive a plurality of different exhaust ports having different sizes.