The need to seal arc-resistant equipment for protection against gases escaping is discussed in IEEE Std C37.20.7, the overall standard governing testing of metal-enclosed equipment under conditions of internal arcing. The standard requires the manufacturer to provide instructions, and give the requirement for installing grout in gaps between the foundation, pad, platform or the like and the base of the equipment. It also refers to fittings or other means to seal the cables for external connections to prevent arcing gases from travelling through the conduit system, where they might present a hazard to an employee in an area away from the equipment, such as where the conduit system enters a transformer terminal chamber, motor terminal box or other termination box.

The installation instructions for SIMOVAC-AR™ arc-resistant medium-voltage controllers and GM-SG-AR medium-voltage arc-resistant switchgear recommend that all openings between the equipment and the support foundation be filled with grout around the entire base of the equipment to prevent escape of arcing byproducts in the event of an internal arcing fault. In addition to sealing the area between the equipment and the foundation, the instructions recommend sealing all conduits to prevent arcing byproducts from entering the conduit system, using a flame-resistant electric cable or duct-sealing system. Both SIMOVAC-AR medium-voltage controllers and GM-SG-AR metal-clad switchgear were qualified by conducting internal arcing tests with third-party oversight by Underwriters Laboratories® (UL®) without these measures incorporated. However, the mounting surface used during testing is quite flat, leaving few if any gaps between the equipment and the mounting surface.

Conditions of installation at actual installations are seldom as good as during the arcing tests, and due to these variable site conditions, Siemens highly recommends the practice of sealing around the base of the equipment and sealing openings around cables.

Siemens is occasionally asked to specify the brand or product to be used for sealing around the perimeter of the equipment, and the brand or product to be used to seal conduits. Siemens does not recommend specific materials because there are many products commercially available, and the user should be free to use the same materials for this function that are being used elsewhere on the project for other types of equipment to suit the specific site conditions.

Sealing around the perimeter of arc-resistant equipment

The particular materials that might be appropriate depend on the application. For sealing around the perimeter of non-arc-resistant GM-SG metal-clad switchgear, Siemens indicates (and have for many years) that asphaltic material be used. The major function in this case is to provide a relatively smooth transition at the front of the equipment from the floor so that a circuit breaker can be easily rolled into the unit without damaging the switchgear or the circuit breaker.

With the advent of arc-resistant, metal-clad switchgear and medium-voltage controllers, the function of the sealing material around the perimeter changed. In addition to the desire to ease the installation of a circuit breaker (in metal-clad switchgear), the need to seal any gaps between the foundation and the equipment structure against escaping gases is added. Asphaltic or epoxy materials should be suitable, especially if the gaps are significant. For small gaps, where grout is not needed to ease circuit breaker installation, commonly available RTV silicone caulk is suitable.
Sealing conduits
In the case of sealing conduits, the materials used to seal around the perimeter of the equipment are generally not appropriate. Conduits may be in the area where the arcing fault occurs, and therefore the sealing materials may be subjected to substantially higher temperatures and pressures during an internal arcing event. Fittings intended for use in hazardous (or classified) environments should be suitable. For example, a conduit originating in a non-hazardous zone, travelling to a hazardous (or classified) zone, should be sealed to prevent hot gases from igniting flammable vapors that the end of the conduit system.

There are materials available for which the publications indicate acceptability for such applications. For example, searching on the web with a search string of "duct seal + arc" yields many citations, some of which lead to these products (among many others):

- Ideal Industries, Inc. Duct Seal Compound
- Abesco Fire LLC Fire-Rated Acrylic Intumescent Caulk
- Abesco Fire LLC Fire-Rated Expanding Foam
- American Polywater® Corporation FST Foam Duct Sealant
- Emerson Electric Co. Nelson Firestop Latex Sealant
- Emerson Electric Co. Nelson Firestop Putty™
- STI, Inc. SpecSeal® Intumescent Sealant
- STI, Inc. SpecSeal® SSP Putty
- 3M™ Fire Barrier Silicone Sealants
- Gardner Bender® Duct Seal Compound.

Siemens does not profess to be experts on cable installation methods or materials, which is why we do not recommend a specific brand or model number of material for sealing the perimeter of the equipment or for sealing of conduits. We also recognize that the user may well have standardized on use of a particular product for these uses, such as for sealing conduits, elsewhere at the installation site.