



June 3, 2002

FlexaBoot
Acoustical Return Air Boot

Re: Return Air Boot Comparative Noise Reduction Tests
ADG File No. 02180

We have reviewed the data resulting from acoustical tests conducted in our offices of the noise reduction capabilities of the proposed new return air duct boot system proposed by FlexaBoot. The following results and comments are offered for your consideration.

BACKGROUND AND OBSERVATIONS

The proposed return air duct boot system (FlexaBoot) consists of a length of 16" diameter insulated acoustical flexible round duct with CPE core and reinforced metallized jacket with metal collars attached to both ends. One end of the acoustical flexible duct is attached to the round neck inlet of a perforated-face return air grille. System also includes a flexible duct radius forming brace (to maintain designed 90-degree shape) and hanger material to support open end of flexible duct.

For comparison, this return air boot system was reviewed next to rectangular 1" – 3 pcf lined sheet metal 90° elbow of comparative dimensions. This boot was installed on the square neck of a perforated-face return air grille which was identical to the one used in the FlexaBoot.

These types of boots are typically employed in open-plan office areas where electronic noise masking systems are used. The purpose of boots on the return air grilles is to ensure that all areas of the suspended ceiling offer a uniform resistance to sound transmissions from the masking sound generated in the ceiling plenum. Any short-circuits or "leaks" of sound through a portion of the ceiling will work to negate the effectiveness of the noise masking system.

Acoustical tests were conducted in a typical open-plan office with a noise masking source consisting of moderate-level pink noise generated above the lay-in ceiling. Two separate tests were conducted. The initial test offered a subjective impression of the relative degree of noise reduction offered by the two boots when installed "side-by-side" in the lay-in ceiling. The second test reviewed the noise levels actually transmitted through the boot without the influence of the other boot being installed in the same ceiling at the same time.

RESULTS AND RECOMMENDATIONS

The results of the first test were that a slight degree of high frequency noise was leaking through the rectangular sheet metal boot that apparently was not occurring through the round-neck FlexaBoot. Further examination revealed that the round FlexaBoot offered a better fit over the neck of the diffuser than the rectangular sheet metal boot, due to the additional weight of the sheet metal boot weighing against the boot-square neck connection which allowed the sound leak to occur. In a true installation, this problem could be alleviated by supporting the discharge end of the sheet metal boot from the structure above.

The second test involved noise reduction measurements of both boot systems conducted in an independent arrangement. That is, when the FlexaBoot was used, the sheet metal boot was replaced with a ceiling tile, and vice-versa. The results of this test produced nearly identical noise reductions by the two boot systems. The only variance between the noise reduction values at each frequency were within the degree of measurement-uncertainty. Therefore, it can be stated that based upon the results of this test, the FlexaBoot will provide equal noise reduction performance to the sheet metal duct boot.

An additional benefit which may perhaps be realized by use of the FlexaBoots over the sheet metal boots is that the FlexaBoot was exceedingly easier to install than the sheet metal boot, especially in a limited-height ceiling plenum and through an existing lay-in grid. While the installers we employed for these tests were not professional sheet metal contractors, their clear preference would be the lighter-weight FlexaBoots.

CONCLUSIONS

Based upon the results of these acoustical tests, we would encourage the use of FlexaBoots as return air boots in ceiling plenums where duct boots are recommended or specified to be installed on return air grilles.

Please contact us if you have any questions.

Sincerely,

Acoustical Design Group, Inc.

Brian F. Kubicki
Vice President