



Room Temperature Vulcanizing (RTV) Sealant Basic Adhesion Test

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. The purpose of this procedure is to define the methods of sealant application, pull off testing and adhesion evaluation used to determine the state of adhesion between the Room Temperature Vulcanizing (RTV) sealant and the substrate.

1.2 Applicability. All engine components designed to be sealed with RTV sealant. All sealant application processes (manual and automated). All component pre-application processes such as plasma treat, manual wiping, and automated wiping.

1.3 Remarks.

1.3.1 Production Audit Purposes. This procedure can be used to audit a production process to ensure conditions for adequate adhesion. Production process audits can be performed on supplied parts tested at the end of the component suppliers manufacturing process. Production process audits can also be done at the plant which assembles the final joint to evaluate the surface at point of RTV application.

Common components include but are not limited to: oil pans, front covers, rear covers, blocks, and cylinder heads.

1.3.2 Adhesion Development Purposes. This procedure can also be used to develop processes to condition surfaces for adhesion.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Pliers.

3.2.2 Razor knife or putty knife.

3.2.3 Caulking gun for manual application of sealant.

3.2.4 Production processing equipment for testing of parts using automated part conditioning processes.

3.3 Test Vehicle/Test Piece.

- Component to be sealed with RTV sealant.
- RTV sealant of the product type to be tested.

3.3.1 Test Surfaces. All surfaces which are part of the RTV sealed joint shall be tested for adhesion. For components which have more than one (1) RTV sealing surface, it is permissible to test more than one (1) surface on the same part at the same time. For example, an engine block which has a front cover, rear cover and oil pan all sealed with RTV, may test all three (3) surfaces on the same block, provided it can be properly oriented to allow for RTV application and curing.

3.4 Test Time.

Calendar time: 7 days

3.5 Test Required Information.

- Part number and supplier of component tested.
- RTV sealant part number, lot number and expiration date. This can be found on the cartridge which contains the RTV sealant.
- Temperature and relative humidity (RH) of the environment in which the RTV will be cured.
- Time of RTV application to the test piece.
- Processing details of the RTV application (i.e., plasma treated prior to application of sealant, wiped with cleaner (name) prior to application of sealant, etc.)

3.6 Personnel/Skills. Experience with operating a caulking gun.

4 Procedure

4.1 Preparation.

4.1.1 Determine a suitable location in which to store the test pieces for the seven (7) day required curing time.

4.1.2 Record the applicable data from 3.5.

4.1.3 If applicable, secure time in the assembly process to prepare the test pieces.

4.1.4 Based on the production process for the components tested, determine the necessary process steps to include in the test. For example, components which are wiped with a solvent and then plasma treated in production, should be wiped with the same solvent process and cycled through the plasma treat station.

4.1.5 Test Part Conditioning. Test parts are to be conditioned for the purpose of recreating the substrate properties as found in the applicable assembly process or as needed to control the outcome of a defined experimental test.

4.1.5.1 Engine Production Process Audit. Prepare the test component using the production assembly equipment and processes as defined in the engine assembly documents and production process instructions. Test parts are to be processed through the assembly line up to the last operation prior to placing into the RTV application station. At this point, the part should be handled in the normal manner, but set aside for manual RTV application to the test surface.

4.1.5.2 Component Production Process Audit. Prepare the test component using the production equipment and processes. Test parts are to be selected from the final process step prior to packaging for shipment. At this point, the part should be handled in the normal manner, but set aside for manual RTV application to the test surface.

4.1.6 Application of the RTV Sealant. The RTV sealant must be applied to the sealing flange in the location on the flange as show in Figure 1. It is important to apply the sealant to the surfaces of the flanges which provide the sealing contact surface in the assembled joint. Do **not** apply the RTV sealant to the flange as in the production drawing.

If the test part does not have a chamfer or step feature, such as the opposing flange to the part which does have a chamfer or step feature, or a part which has a groove instead of a chamfer and step, apply the RTV sealant directly to the flange location which it contacts in the assembled joint.