

News to Use

Design Requirements Manual

The formulae $\frac{\partial U}{\partial x} + \frac{\partial}{\partial x}(\rho U) = -\frac{\partial p}{\partial x} + \frac{\partial}{\partial x}(\mu \frac{\partial U}{\partial x}) + \rho(\rho - \rho_0)$ for building $\frac{\partial}{\partial x}(\rho U U) = -\frac{\partial p}{\partial x} + \frac{\partial}{\partial x}(\mu \frac{\partial U}{\partial x} - \rho \overline{u'u'}) + \rho(\rho - \rho_0)$ state of the art $\frac{\partial}{\partial x}(\rho U U) = -\frac{\partial p}{\partial x} + \frac{\partial}{\partial x}(\mu \frac{\partial U}{\partial x} - \rho \overline{u'u'}) + \rho(\rho - \rho_0)$ biomedical research facilities.

'Design Requirements Manual (DRM) News to Use' is a monthly ORF publication featuring salient technical information that should be applied to the design of NIH biomedical research laboratories and animal facilities. NIH Project Officers, A/E's and other consultants to the NIH, who develop intramural, extramural and American Recovery and Reinvestment Act (ARRA) projects will benefit from 'News to Use'. Please address questions or comments to: ms252u@nih.gov

NIH Laboratory Sealant Requirements

Joint sealants are an important requirement for key interior areas of NIH laboratory facilities. The function of the sealant is to prevent the penetration of air, pest, gas, dust, smoke and liquid from one location through a barrier into another. Sealants are also required for thermal and moisture protection, fire stopping and finish work. Sealants are a requirement for proper compliance with the NIH Integrated Pest Management program and for ensuring building integrity. Reference the Design Requirements Manual (DRM) Chapter 4, Exhibit X4-2-A Sealant Table for additional information. This table provides detailed information on the types of sealants and locations of areas requiring sealants. Exhibit X4-2-A has been updated to include information from Exhibit X4-7A which now has been deleted from the DRM.

Non-Laboratory spaces and each category of biosafety level laboratories require specific type of sealant. Reference the appropriate biosafety level column for guidance in the proper selection and the location of the sealant. The minimum standard for the sealants are provided within the American Society for Testing and Material (ASTM) standards:

- JS-1 Architectural Urethane Sealant ASTM C1620
- JS-2 100% Silicone ASTM C1518
- JS-3 100 % Silicone Mildew Resistant ASTM C1518
- JS-4 Siliconized Acrylic Latex ASTM C1518, ASTM C834
- JS-5 Urethane ASTM C1620
- JS-6 Non-Halogenated Latex- Based Elastomeric Sealant ASTM C920
- JS-7 100% Silicone Aluminum Finish ASTM C920

Non-Laboratory

The Non-Laboratory spaces are defined as spaces outside of lab zone. Some sealant requirements for Non-laboratory spaces are the following:

- JS-4 to seal door frames to wall boards and joints between walls of dissimilar materials.
- JS-1 shall be used to seal the door threshold to the floor, as well as control joints in floors.
- JS-6 is to be used to seal all penetrations on the top and bottom of the slabs, as well as wall penetrations for sleeves, collars and the surrounding construction.
- JS-3 shall be used to seal the lavatory fixtures and to seal the toilet mounts to the surface and to seal the sink faucet to mounting surfaces.

BSL2

Some sealant requirements for Biosafety level 2 laboratories are the following:

- JS-4 shall be used at the door frame and wall board interface, openings in table legs, floor mounted supports, cabinets in contact with dissimilar materials and where they contact one another and all counter top connections with other surfaces.

- JS-4 sealant is also required at the top and bottom of wall mounted shelving brackets, shelving wall junctures, peninsula shelving support at counter top and at ceiling and cabinets where they contact one another.
- JS-4 sealant is required for all wall guards, bumpers, rails, top and bottom of cove base, perimeter of suspended acoustical ceiling frames at the wall juncture, interior window frames, at all wall and ceiling for surface mounted cover plates, at the baseboard molding, control joints in walls and ceilings and joints between walls of dissimilar materials.
- JS-1 is required to seal around floor surface-mounted mounting plates, control joints in the floor and at the door threshold to floor attachment.
- JS-6 is required at all wall penetrations on the top and bottom of the slabs, wall sleeves, collars, and surrounding construction.
- JS-5 is required to seal all floor mounted equipment supports, legs and standoff supports

BSL3, ABSL2 and ABSL3

The BSL3, ABSL2 and ABSL3 laboratories have the most comprehensive sealant guidelines. Sealants are required at all exposed connecting surfaces within all areas of the laboratory such as the doors, cabinetry, shelving, walls, floors, ceilings, HVAC, electrical, equipment and plumbing fixtures.

- The doors require the JS-4 at the penetrations, hinge plates (including piano hinge), frames where they meet the adjacent wall, around lock sets, view panel frames, view panel glass (even if gasketed), thresholds, door protection plates, door guards and door latch.
- JS-4 is required to seal ductwork that penetrates the wall, diffusers/grill joints, vacuum pass through, sprinkler collars, and piping penetrations.
- Seal conduit at wall and ceiling surfaces, perimeter of electrical panels, light fixture connections to walls and fixed equipment with JS-4.
- JS-5 is required to seal top and bottom of the cove base.
- JS-6 shall be used to seal space in wall penetrations, including inside sleeves, collars, and surround construction.
- JS-7 is required to seal all gaps and opening in racks, seams at the hot water insulation seams, gaps that exist between stainless steel sheet metal in all cage washers, tunnel washers and rack washers.

This article is a brief summary of the data presented in the DRM Sealant Table mainly addressing the architectural requirements and some mechanical and electrical requirements. Reference the Sealant Table for more detailed information and requirements such as the HVAC, plumbing and electrical items. In addition to the DRM, contact the NIH ORS Division of Occupational Health and Safety Community Health Branch (CHB) for guidance on sealing and pest management during design. For further information refer to the DRM Chapter 4.

Further details on this month's topic are available on the DRM website

<http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/DesignRequirementsManualPDF.htm>

DRM Exhibit X4-2-A Sealant Table